

The Texas Commission on Environmental Quality (TCEQ or commission) adopts the amendment to §298.290 and adopts new §§298.300, 298.305, 298.310, 298.315, 298.320, 298.325, 298.330, 298.335, 298.340, 298.350, 298.355, 298.360, 298.365, 298.370, 298.375, 298.380, 298.385, and 298.390.

Sections 298.290, 298.305, 298.310, 298.320, 298.325, 298.330, 298.335, 298.355, 298.360, 298.375, and 298.380 are adopted *with changes* to the proposed text as published in the April 13, 2012, issue of the *Texas Register* (37 TexReg 2521). Sections 298.300, 298.315, 298.340, 298.350, 298.365, 298.370, 298.385, and 298.390 are adopted *without changes* to the proposed text and will not be republished.

Background and Summary of the Factual Basis for the Adopted Rules

In 2007, the 80th Legislature passed House Bill 3 (HB 3), relating to the management of the water resources of the state, including the protection of instream flows and freshwater inflows; and Senate Bill 3 (SB 3), relating to the development, management, and preservation of the water resources of the state. Both of these bills amended Texas Water Code (TWC), §11.1471, which requires the commission to adopt rules related to environmental flow standards and set-asides. The commission is proposing to implement the environmental flow provisions of HB 3, Article 1, and SB 3, Article 1, and proposes environmental flow standards for the Colorado and Lavaca Rivers, their associated tributaries, and Matagorda and Lavaca Bays; and the Guadalupe, San

Antonio, Mission, and Aransas Rivers, their associated tributaries, and Mission, Copano, Aransas, and San Antonio Bays.

Prior to HB 3/SB 3, the commission had authority to protect environmental interests as it permitted state surface water. The commission had authority to maintain: existing instream uses under TWC, §11.147(d); water quality under TWC, §11.147(d) and §11.150; fish and wildlife habitat under TWC, §11.147(e) and §11.152; and freshwater inflows to bay and estuary systems under TWC, §11.147(a) - (c). TWC, §11.147(b) - (e) and §11.152 required that these environmental considerations be included only to the extent practicable or reasonable and required that environmental considerations be considered along with other factors of public welfare. HB 3/SB 3 did not make major changes to this commission authority.

The commission also retains its ability, granted prior to HB 3/SB 3, to place special conditions in water right permits to protect environmental interests. Before HB 3/SB 3, TWC, §11.134(b)(3)(D), required consideration of environmental interests for new appropriations of water, including amendments that granted an increase in the amount of water that could be diverted, and TWC, §11.085, required consideration of environmental interests for interbasin transfers. Permits for water projects that call for the re-diversion of wastewater or return flows to a watercourse, so called "indirect reuse" projects, were also subject to special conditions to protect environmental uses

under TWC, §11.042 and §11.046. Amendments that were not new appropriations were required to be authorized if, among other criteria, the amendment would not cause adverse impact to the environment of greater magnitude than under the original permit under TWC, §11.122(b). As a practical matter, if any adverse impact to the environment was noted in an application for an amendment, then special conditions were crafted to remove the adverse impact so that the amendment might be granted.

HB 3/SB 3 changed the process by which the state would decide the flow that needed to be preserved in the watercourse for the environment and the balancing of environmental interests along with other public interests. HB 3/SB 3 created a statewide Environmental Flows Advisory Group (Advisory Group). The Advisory Group was given the responsibility to appoint Basin and Bay Area Stakeholder Committees (the stakeholder committee) for each of the state's river basin, bay, and estuary systems. The stakeholder committees, in turn, appointed a Basin and Bay Expert Science Team (the science team). The science teams were to develop a recommended environmental flow regime, or schedule of flow quantities adequate to support a sound ecological environment. The stakeholders were to take the science team's recommendations and consider those recommendations in conjunction with other factors, including the present and future needs for water for other uses. The stakeholders were also to report their recommendations to the commission. Both the science teams and the stakeholder committees were to reach their recommendations on a consensus basis to the maximum

extent possible. The commission, in turn, is to take the recommendations from the science team, the stakeholder committees, the Advisory Group, and a statewide Science Advisory Committee (SAC), and consider that information along with other information and by rule adopt environmental flow standards for each basin and bay system. At the same time the commission is to establish an amount of unappropriated water, if available, to be set aside to satisfy the environmental flow standards to the maximum extent reasonable when considering human water needs. Once the environmental flow standards are adopted, the commission's objective or goal will be to protect the standards, along with the interests of senior water right holders, in its water rights permitting process for new appropriations and amendments that increase the amount of water to be taken, stored, or diverted. Under HB 3/SB 3, the commission may use the set-aside or use its existing authority to place special conditions in permits to protect the environmental flow standards.

The commission received the Colorado and Lavaca Rivers and Matagorda and Lavaca Bays science team report on March 1, 2011, and the stakeholder committee report on August 31, 2011. The commission received the Guadalupe, San Antonio, Mission, and Aransas Rivers and Mission, Copano, Aransas, and San Antonio Bays science team report on March 1, 2011, and the stakeholder committee report on September 1, 2011. Copies of the Colorado and Lavaca Rivers and Matagorda and Lavaca Bays reports are available on the following Web site:

http://www.tceq.texas.gov/permitting/water_rights/eflows/colorado-lavaca-bbsc.

Copies of the Guadalupe, San Antonio, Mission, and Aransas Rivers and Mission, Copano, Aransas, and San Antonio Bays reports are available on the following Web site:

http://www.tceq.texas.gov/permitting/water_rights/eflows/guadalupe-sanantonio-bbsc.

The commission adopts Subchapter D to cover the Colorado and Lavaca Rivers and Matagorda and Lavaca Bays. The commission adopts Subchapter E to cover the Guadalupe, San Antonio, Mission, and Aransas Rivers and Mission, Copano, Aransas, and San Antonio Bays.

HB 3/SB 3 also added TWC, §11.02362(p), which recognized the importance of adaptive management and provided that after submitting its recommendations regarding environmental flow standards and strategies to meet the environmental flow standards to the commission, each stakeholder committee prepare and submit a work plan for approval by the Advisory Group. The work plan is to establish a periodic review of the basin and bay environmental flow analyses and environmental flow regime recommendations, environmental flow standards, and strategies, prescribe specific monitoring, studies, and activities; and establish a schedule for continuing the validation or refinement of the basin and bay environmental flow analyses and

environmental flow regime recommendations, the environmental flow standards adopted by the commission, and the strategies to achieve those standards.

The environmental flow standards for the Sabine and Neches Rivers and Sabine Lake Bay were adopted on April 20, 2011 and effective on May 15, 2011. On September 8, 2011, the Advisory Group approved a work plan and work plan addendum submitted by the Sabine and Neches Rivers and Sabine Lake Bay stakeholders. The work plan recommends a schedule for review of the environmental flow analyses and environmental flow regime recommendations, environmental flow standards, and strategies. Therefore, the commission adopts amendments to §298.290 for the Sabine and Neches Rivers and Sabine Lake Bay to change the schedule for revision of the standards.

Section by Section Discussion

Subchapter C: Sabine and Neches Rivers and Sabine Lake Bay

§298.290, Schedule for Revision of Standards

The commission adopts the amendment to §298.290 to provide for a changed schedule for re-examination of the environmental flow standards. On September 8, 2011, the Advisory Group approved a work plan and work plan addendum submitted by the Sabine and Neches Rivers and Sabine Lake Bay stakeholders. The work plan proposes a schedule for review of the environmental flow analyses and environmental flow regime

recommendations, environmental flow standards, and strategies. The stakeholders proposed that the environmental flow standards be reviewed on a five-year cycle integrated with the SB 1 (75th Legislature, 1997) Regional Water Planning five-year cycle. The work plan proposes that the SB 3 five-year periodic review schedule be aligned so that the review is available for consideration by the Regional Planning Groups to consider in each round of Regional Water Planning.

Based on the approved work plan, the commission adopts the amendment to the rule stating that the stakeholders submit their review of the environmental flow analyses and environmental flow regime recommendations, environmental flow standards, and strategies, for the Sabine and Neches Rivers and Sabine Lake Bay, by September 15, 2013, and every five years thereafter, and that rule revisions, if any, be adopted by the commission within one year of the submittal of the stakeholder's review. In response to comment, the commission added the phrases "arising from a rulemaking undertaken in conjunction with any such periodic review" and "after the deadline for the review" and deleted the phrase "of the stakeholder's submittal of their review" to adopted §298.290 for clarification. At the August 8, 2012 commission agenda, the commission added the words and phrases "Any," "or, if," and "determines that revisions to the adopted environmental flow standards are appropriate at the time of the periodic review" and deleted the words "and," "agrees," and "The" from adopted §298.290. This change clarifies that the commission could recommend revisions to the adopted standards,

absent a stakeholder recommendation, in accordance with the periodic review, if the commission determined that such revisions were appropriate and further clarifies that the periodic review may not result in a rulemaking.

Subchapter D: Colorado and Lavaca Rivers and Matagorda and Lavaca Bays

The commission adopts new Subchapter D to contain all of the environmental flow standards and rules specific to the basin and bay system composed of the Colorado and Lavaca Rivers, their associated tributaries, and Matagorda and Lavaca Bays. The science team delivered its report to the commission on March 1, 2011. The stakeholder committee delivered its recommendations to the commission on August 31, 2011. The commission now adopts environmental flow standards as required under TWC, §11.02362(d). This adopted new subchapter would implement the schedule established by the Advisory Group under TWC, §11.02362, and environmental flow standards required of the commission in TWC, §11.1471.

§298.300, Applicability and Purpose

The commission adopts new §298.300 to describe the purpose of Subchapter D and under what circumstances it applies.

§298.305, Definitions

The commission adopts new §298.305. The adopted section has definitions of terms

that will apply only to this subchapter. The commission acknowledges that overbank flows and flushing flows for the bays and estuaries are considered to be components of a flow regime for a sound ecological environment. However, these flows result from naturally occurring large rainfall events, which will likely continue to occur. Therefore, the commission is not including overbank flows or flushing flows as a component of the adopted standards. In §298.305(1), (7), (9), (13), and (17) the commission adopts definitions for "Annual average inflow," "Fall season quantity," "Intervening season quantity," "Monthly threshold inflow," and "Spring season quantity" because the adopted freshwater inflow standards for Matagorda Bay vary by season and year. In response to comment, the commission added the phrase "during any individual calendar year," to adopted §298.305(17) to clarify how this quantity is calculated. In response to comment, the commission also deleted the word "strategy" and the phrase "which is used for the sole purpose of providing additional freshwater inflows to Matagorda Bay through voluntary strategies" from §298.305(13) because the monthly threshold inflow applies in consideration of new applications to store, take, or divert water. In §298.305(2) and (11) the commission adopts definitions for "Annual strategy frequency," and "Long-term annual strategy quantity." These frequencies and quantities are used for the sole purpose of providing additional freshwater inflows to Matagorda and Lavaca Bays through voluntary strategies. In §298.305(3), (4), (14), and (20) the commission adopts definitions for "Average condition," "Dry condition," "Severe condition," and "Wet condition." A range of flow conditions - average, dry, severe, and

wet - is adopted to be defined as the stakeholders recommended. In response to comment, the commission added the phrases "and represents periods when conditions are dry but not severe" and "and that is intended to represent periods when conditions are drier than average conditions but not severe" to adopted §298.304(4) to clarify the definition of "Dry condition." In response to comment, the commission added the phrase "and that is intended to represent the driest periods" to adopted §298.305(14) to clarify the definition of "Severe condition." In response to comment, the commission also added the phrase "and that is intended to represent the wettest conditions" to adopted §298.305(20) to clarify the definition of "Wet condition." In §298.305(5), (15), (19), and (21) the commission adopts definitions for the seasons "Fall," "Spring," "Summer," and "Winter" because the adopted environmental flow standards for this basin and bay system vary by season. The definitions are the same as the definitions of the seasons in the recommendations of the science team, which were subsequently used by the stakeholders to develop their recommendations. In §298.305(6), (8), and (16) the commission adopts definitions for "Fall inflow quantity," "Intervening inflow quantity," and "Spring inflow quantity" because the adopted freshwater inflow standards for Lavaca Bay vary by season and year. In response to comment, the commission added the phrase "during any individual calendar year," to adopted §298.305(6) and (16) to clarify how these quantities are calculated. In §298.305(10) the commission adopts a definition for "Inflow regime level" because the adopted freshwater inflow standards for Matagorda and Lavaca Bays include multiple levels of freshwater inflows. In response

to comment, the commission added the word and phrases "one of," "that includes a spring season quantity, a fall season quantity, and an intervening season quantity as described in the figure located in §298.330(a)(2)," "inflow," "inflow," "inflow," and "as described in the figure located in §298.330(c)," and deleted the word "season" to clarify application of this term. In §298.305(12) the commission adopts a definition for "Modeled annual frequency" because the frequencies at which specific levels of freshwater inflows occur in the commission's water availability models (WAMs) differ from the frequencies based on gaged flows used for the purpose of providing additional freshwater inflows to Matagorda and Lavaca Bays through voluntary strategies. Finally, in §298.305(18) the commission adopts a definition for "Sound ecological environment" for this basin and bay system. This adopted definition is based on the definition recommended by the science team.

§298.310, Findings

The commission adopts new §298.310 regarding findings related to sound ecological environments. The adopted finding regarding the ecological environment is consistent with the science team and stakeholder reports. Information on the commission's reasoning for the adopted schedule of flow quantities and environmental flow standards can be found in this preamble under the analyses for §§298.320, 298.325, and 298.330. In response to comment, the commission added the word and phrase "variable" and "and that incorporate inflow and frequency targets at which specific levels of freshwater

inflows occur, which are used for the sole purpose of providing additional freshwater inflows to Matagorda and Lavaca Bays through voluntary strategies" and deleted the phrase "that vary by season" from adopted §298.310(c) to acknowledge that freshwater inflows vary by season and year and the importance of targets to increase freshwater inflows through voluntary strategies. In response to comment, the commission added new §298.310(d), stating, "For East Matagorda Bay, the commission does not adopt environmental flow standards but finds that the sound ecological environment of East Matagorda Bay can be maintained by avoiding further reduction of freshwater inflows, to the extent those reductions can be avoided, and that strategies to provide additional freshwater inflows to East Matagorda Bay should be pursued" in order to recognize the importance of East Matagorda Bay in the adopted rule. This adopted new section would implement TWC, §11.1471.

§298.315, Set-Asides and Standards Priority Date

The commission adopts new §298.315 which establishes the priority date for any set-asides and any modeling of the environmental flow standards in the commission's WAMs as the date the commission received the report from the science team for the basin and bay system, which was March 1, 2011. The commission protects high flow pulse standards from being permitted to smaller applicants for new appropriations because under adopted §298.335(b), (c), and (e), some of the high flow pulse standards would not be included in some water right permits for new appropriations. In addition,

the commission needs to ensure that new appropriations, or amendments to add a new appropriation, will not affect downstream flow standards at measurement points that may not be applicable to those new appropriations or amendments. The commission also adds these changes to ensure consistency with adopted §298.20.

§298.320, Calculation of Hydrologic Conditions

The commission adopts new §298.320 to explain the determination of hydrologic conditions for implementation and application of the standards to water right permits to which the proposed standards apply. The hydrologic conditions are based on the recommendations of the stakeholders, and are calculated from actual gaged flows or reservoir storage. In response to comment, the commission added new §298.320(g) stating, "The hydrologic condition indicators set out in subsections (b) - (d) of this section govern the operations of permits subject to this subchapter during the initial period, of not longer than ten years, until the environmental flows standards in this subchapter are re-evaluated. Those indicators were calculated to achieve compliance with the percentages of time stated in subsections (e) and (f) of this section. The hydrologic condition indicators set out in subsections (b) - (d) of this section will be recalculated, no less frequently than once every ten years, in order to achieve, to the greatest extent possible, compliance with the percentages of time stated in subsections (e) and (f) of this section." The commission adds this new subsection to provide for ongoing, periodic revisions of the hydrologic condition indicators. Implementation of

hydrologic conditions in the commission's WAMs, used in the availability determination for water rights permitting for the river basins subject to this subchapter may result in different cumulative streamflows, reservoir storage, or reservoir elevation than those described in this section. The commission's adopted rules, for purposes of water availability determinations, provide that hydrologic conditions used in the commission's WAMs will be calculated using the applicable frequencies for hydrologic conditions recommended by the stakeholders and the WAM simulated flows or reservoir storage.

§298.325, Schedule of Flow Quantities

The commission adopts new §298.325 regarding the schedule of flow quantities. The commission adopts this section to explain the implementation of the environmental flow standards in the following section. The commission may not use the exact wording of this section as the wording in water right permits issued after the adoption of these rules. However, this section describes how the commission will implement the proposed environmental flow standards in water right permits or amendments for new appropriations.

Subsistence flows are the minimum flows below which the commission will not allow diversions or storage of water. Therefore, the water right holder may not divert or store water if the flow at the applicable measurement point is below the subsistence flow standard. During severe hydrologic conditions, if the flow is above the subsistence flow

standard but below the dry base flow standard, the water right holder may divert or store water down to the subsistence flow standard. The commission's adopted rules provide that the subsistence flow standard can be variable depending on the season, and that only the subsistence flow for a particular season limits diversions by a water right subject to the standards, in that season.

During dry, average, or wet hydrologic conditions, a water right holder may not divert water when the flow is below the base flow standard for that season. Once the flow at the applicable measurement point is above the base flow standard for the season, the water right holder may store or divert water according to its permit as long as the flow at the measurement point does not fall below the applicable base flow standard for that season and in accordance with the applicable hydrologic condition as set out in §298.320. In response to comment, the commission added the sentence, "For all measurement points, the dry base flow standard applies during severe hydrologic conditions" to adopted §298.325(c) to clarify which base flow standard applies during severe hydrologic conditions.

The commission's adopted rules provide that pulse flows be allowed to pass if streamflows are above the base or subsistence flow standard for the season and if the pulse flow trigger level is reached at the measurement point. The commission's adopted rules provide that, for measurement points on the Colorado River below Lake Travis,

once the pulse flow trigger conditions are met, the water right owner may not store or divert water unless the daily average flow is at or above the pulse flow trigger level and the applicable pulse duration has occurred. For all other measurement points, once the pulse flow trigger conditions are met, the water right holder may not store or divert water until either the applicable pulse volume passes the applicable measurement point or the applicable pulse duration has occurred.

The adopted rule does not require that a water right holder be required to produce a high flow pulse because pulses occur when there are high rainfall events. The commission's adopted rule does provide that during these high rainfall events, the applicable high flow pulse be allowed to pass downstream. A water right holder on the Colorado River below Lake Travis can divert water in excess of the applicable pulse requirement as long as those diversions do not prevent the occurrence of the pulse flow trigger level of the applicable pulse and as long as the duration requirement is met for the applicable pulse. The commission's adopted rule provides that a water right holder on the Colorado River above Lake Travis, on tributaries of the Colorado River, in the Lavaca River Basin, or in the Colorado-Lavaca and Lavaca-Guadalupe Coastal Basins can divert water in excess of the applicable pulse flow trigger requirement as long as those diversions do not prevent the occurrence of the pulse flow trigger level of the applicable pulse and as long as the duration or volume requirement is met for the applicable pulse.

If, in a particular season, only one or none of the small seasonal high flow pulses identified in the commission's adopted rule is generated, there would be no need to "catch up" or allow more than the applicable number of high flow pulses to pass in the following season. There would also be no need to "catch up" or allow more than the applicable number of large seasonal or annual high flow pulses to pass. For the Colorado River below Lake Travis, there would also be no need to allow more than the applicable number of larger high flow pulses to pass. The commission agrees with the stakeholders that pulse flows not be tied to a hydrologic condition. In addition, the commission's adopted rule provides that if the pulse requirements for a large high flow pulse event are satisfied and therefore this high flow pulse is allowed to pass, the requirements for smaller high flow pulse events during that season would be considered to be satisfied at the applicable measurement point.

The commission's adopted rule provides that if a water right owner stored water at a previous time and complied with the applicable environmental flow requirements at that time, the water right owner would not need to comply with any environmental flow requirements in effect when subsequent use of that stored water occurs.

§298.330, Environmental Flow Standards

The commission adopts new §298.330 to provide the environmental flow standards of

TWC, §11.1471, for the basin and bay system composed of the Colorado and Lavaca Rivers, associated tributaries, and Matagorda and Lavaca Bays. The commission based its decision on consideration of the recommendations from the stakeholders, sound science, and other public interests and relevant factors.

The stakeholders expressed strong concerns about the reduction of freshwater inflows to East Matagorda Bay. The stakeholders adopted the following statement: "Strategies to maintain and increase freshwater inflows should be pursued to support a sound ecological environment within East Matagorda Bay." The stakeholders' intent was to avoid a further reduction of freshwater inflows, to the extent those reductions can be avoided, and that strategies should be pursued to provide additional freshwater inflows to East Matagorda Bay.

The adopted bay and estuary standards for Matagorda and Lavaca Bays generally track the recommendations of the stakeholders. The stakeholders recognized the role of environmental flow standards both in water rights permitting and in establishing targets for purposes of providing additional freshwater inflows through voluntary strategies. Based on this the stakeholders proposed a dual set of recommendations for freshwater inflows. The stakeholders proposed that, for purposes of water availability determinations, specific values based on the WAM in effect at the time they developed their recommendations be included in the adopted rule. The stakeholders recognized

that the WAMs can change as new permits and amendments are added and for other reasons and, therefore, the commission does not propose to include specific frequencies for use in water availability determinations in the adopted rule. Instead, the commission's adopted rule provides that new permits or amendments to increase the amount of water stored, taken, or diverted shall not decrease the long-term annual strategy quantity, as adjusted consistent with the stakeholders' recommendation, the modeled annual frequency, or the monthly threshold inflow below the baseline values in the WAM in effect at the time the first application for a water right permit or amendment subject to this subchapter is considered. In response to comment, the commission added new §298.330(a)(1)(3) stating, "decrease the monthly inflow quantity to Matagorda Bay below 15,000 acre-feet per month" to include a decrease of monthly threshold inflow as a criterion for determining impairment of the standards, and made conforming changes to the figures in §298.330(a)(2) and (b). The commission also added the word "help" to adopted §298.330(b) and (d) to clarify its intent to protect incremental additional freshwater inflows resulting from voluntary permitted strategies. The commission also added the words "describe" and "frequency" and deleted the words "listed" and "level" to adopted §298.330(d) to clarify this provision. In addition, the commission's adopted rule provides that new permits or amendments to increase the amount of water stored, taken, or diverted shall not decrease the monthly inflow quantity to Matagorda Bay below 15,000 acre-feet per month. The commission further adopts rules providing that if strategies are

implemented through a water right permit to provide additional freshwater inflows to Matagorda or Lavaca Bays, any subsequent new permits or amendments for new appropriations of water not be allowed to reduce the long-term annual quantity or the long-term annual frequency below the modeled levels that would occur with the permitted strategy in place. The stakeholders recommended that a flushing flow event be allowed to pass for Lavaca Bay. A flow event of the magnitude proposed by the stakeholders is the result of high rainfall events, which should continue to occur. In addition, events of this magnitude can result in out-of-bank flood events. Therefore, the commission did not include the flushing flow event in the adopted standards.

The measurement points and the adopted base flow and subsistence flow standards are those recommended by the stakeholders. The adopted high flow pulse standards are generally based on recommendations of the stakeholders. Although the stakeholders did not recommend overbank flows, the stakeholders recommended pulse trigger levels based on flood stage levels. These pulse trigger levels were intended to represent bankfull events. However, in many locations, flows at the flood stage could inundate low-lying areas and could therefore represent an event larger than the bankfull event. The commission reduced the trigger levels for some high flow pulses to the action stage level to ensure that application of the standards would not cause flooding. The action stage level is defined by the National Weather Service as the stage which, when reached by a rising stream, represents the level where the National Weather Service or a

partner/user needs to take some type of mitigation action in preparation for possible significant hydrologic activity. In addition, at some locations, the stakeholders recommended pulse flows with return periods in excess of one year. With the exception of the lower Colorado River below Lake Travis, there was little site-specific information supporting these specific higher pulse flow levels and frequencies. The executive director (ED) also reviewed the impacts of greater than annual events on the remaining unappropriated water in these basins as discussed further. Based on these factors, and with the exception of measurement points on the lower Colorado River below Lake Travis, the commission did not include pulses with return periods longer than one year in the adopted rule. For measurement points on the Colorado River below Lake Travis, the commission adopts pulse flows with a return period longer than one year because those specific pulse flow levels were based on a site-specific study.

The stakeholders performed an analysis of the impacts of the adopted standards on future water supply needs, reviewed unappropriated water at various locations throughout the basin and bay system, and considered the results of these analyses in their recommendations. The ED reviewed the information provided by the stakeholders. The ED also performed his own analysis to address the issue of balancing human and other competing needs for water in the basin and bay system by examining the impact of the proposed standards on unappropriated flow in the river basins affected by the adopted rule. The ED's analysis is not intended as a finding that water is

available for specific projects. When applications for projects are evaluated, water availability is based on specific facts in those applications.

The ED analyzed the impacts of the adopted standards on the remaining unappropriated water at representative measurement points in the Colorado and Lavaca River Basins and associated coastal basins. The ED based his analysis on results from the WAMs used for his water availability determinations for new permits or amendments that request a new appropriation of water. The ED calculated both the amount of unappropriated water at selected measurement points and the impact of the adopted standards on unappropriated water. The remaining unappropriated water in these basins, before application of the adopted standards, varied from less than 1% of the time to approximately 18% of the time at measurement points in the Colorado River basin and from 40% of the time to 60% of the time in the Lavaca River Basin and associated coastal basin streams. Unappropriated water in these basins generally occurs during times of higher flow; therefore, increasing pulse volumes and frequencies during wetter periods reduces the remaining unappropriated flow. The ED evaluated the freshwater inflow standards recommended by the stakeholders and found that application of the standards resulted in some water available for appropriation during higher flow events. Copies of the WAMs used in this analysis are available at: <http://www.tceq.texas.gov/goto/eflows/rulemaking>.

The ED performed water quality analyses to evaluate relationships between streamflow and the water quality parameters identified by the science team and to look for trends and criteria excursions. These analyses did not identify any areas of concern that need to be addressed through this rulemaking process. The ED also considered whether reduction of the adopted standards would result in a significant increase in unappropriated water in these basins and found that it did not. Based on the results of the analysis of unappropriated flow and the water quality analysis, the ED determined that there would be no significant impact from implementation of the adopted standards.

The adopted rule does not set aside any unappropriated water to protect the proposed environmental flow standards. Any unappropriated water that is available in these river basins is available only during relatively wet conditions. The commission determines that the environmental flow standards may be adequately protected by special conditions in water right permits or amendments for new appropriations of water in these basins. Special conditions are a more effective method to maximize the use of water by allowing water to be used for dual purposes. Special conditions to protect environmental flows may allow water permitted to downstream senior water rights, as well as return flows and permitted but unused water, to satisfy the special conditions. This adopted new section would implement TWC, §11.1471.

§298.335, Water Right Permit Conditions

The commission adopts new §298.335 relating to water right permit conditions. The adopted provision would require the commission to place special conditions in water right permits for new appropriations and amendments that would add additional appropriations to existing permits. The special conditions would be to protect the environmental flow standards established by the subchapter. Consistent with the recommendations of the stakeholders, the commission's adopted rule provides that, with the exception of measurement points on the Colorado River below Lake Travis where the water right permit applicant proposes to store more than 2,500 acre-feet of water or divert water at a rate of more than 500 cubic feet per second (cfs), water right permits to divert or store water would contain special conditions adequate to protect the environmental flow standards. Water right permit applications on the Colorado River below Lake Travis, where the water right permit applicant proposes to store less than 2,500 acre-feet of water or to divert at a rate less than 500 cfs would not contain special conditions relative to high flow pulses. In response to comment the commission added the phrase, "all pulse flow requirements up to the one per year pulse flow requirement except as specified in subsections (c) and (d) of this section" and deleted the phrase, "the environmental flow standards of this subchapter" from adopted §298.335(b). The commission added new §298.335(c) stating, "For water right permits with an authorization to divert at a rate greater than 800 cfs or to store more than 2,500 acre-feet in an on-channel reservoir, on the Colorado River below Lake Travis, and to which

the environmental flow standards apply, that are issued after the effective date of this subchapter, the water right permit or amendment shall contain flow restriction special conditions that are adequate to prevent impairment of the one per 18-month pulse flow requirement. Impairment of the one per 18-month pulse flow requirement would occur if the permit, in combination with other permits subject to this subchapter, that are issued after the effective date of this subchapter, would reduce the frequency of occurrence or the average volume of the one per 18-month pulse by more than 10% based on the period of record of the water availability model in effect at the time the first permit subject to this subchapter is considered." The commission also added new §298.335(d) stating, "For water right permits with an authorization to divert at a rate greater than 2,700 cfs or to store more than 2,500 acre-feet in an on-channel reservoir, on the Colorado River below Lake Travis, and to which the environmental flow standards apply, that are issued after the effective date of this subchapter, the water right permit or amendment shall contain flow restriction special conditions that are adequate to protect the one per two-year pulse flow requirement" and relettered the remaining subsection as adopted subsection (e). The commission added these provisions to clarify how water right permit flow restriction special conditions apply to pulse flows larger than the one year event on the Colorado River below Lake Travis. This adopted new section would implement TWC, §11.134(b)(3)(D) and §11.1471.

§298.340, Schedule for Revision of Standards

The commission adopts new §298.340 to provide the schedule for re-examination of the environmental flow standards. The commission proposes to take up a possible rulemaking to change the standards ten years from the effective date of the rules, unless the stakeholder committee submits a work plan approved by the Advisory Group that calls for a more frequent review. The commission notes that it is prohibited from providing that the rulemaking process occurs more frequently than once every ten years unless the stakeholders' work plan approved by the Advisory Group under TWC, §11.02362(p), calls for a more frequent schedule. The commission notes that, as of the time of adoption of these rules, it has not received an approved work plan from the stakeholder committee. Should the commission receive an approved work plan after final adoption of this rule package, the commission is free to consider an amendment to this section and change the schedule more often than once every ten years. The adopted new section would implement TWC, §11.1471(f).

Subchapter E: Guadalupe, San Antonio, Mission, and Aransas Rivers, and Mission, Copano, Aransas, and San Antonio Bays

The commission adopts new Subchapter E to contain all of the environmental flow standards and rules specific to the basin and bay system composed of the Guadalupe, San Antonio, Mission, and Aransas Rivers, their associated tributaries, and Mission, Copano, Aransas, and San Antonio Bays. The science team delivered its report to the commission on March 1, 2011. The stakeholder committee delivered its

recommendations to the commission on September 1, 2011. The commission must now adopt environmental flow standards under TWC, §11.02362(d). This adopted new subchapter would implement the schedule established by the Advisory Group under TWC, §11.02362, and environmental flow standards required of the commission in TWC, §11.1471.

§298.350, Applicability and Purpose

The commission adopts new §298.350 to describe the purpose of Subchapter E and under what circumstances it applies.

§298.355, Definitions

The commission adopts new §298.355. The adopted section has definitions of terms that will apply only to this subchapter. The commission acknowledges that overbank flows are considered to be components of a flow regime for a sound ecological environment. However, these flows result from naturally occurring large rainfall events, which will likely continue to occur. Therefore, the commission is not including overbank flows as a component of the adopted standards. In §298.355(1), (2), and (11) the commission adopts definitions for "Average condition," "Dry condition," and "Wet condition." A range of flow conditions - average, dry, and wet - is adopted to be defined as the stakeholders recommended. In response to comment, the phrase "and that is intended to represent periods that are neither dry nor wet" was added to the definition

of "Average condition" in adopted §298.355(1); the phrase, "and that is intended to represent the driest periods" was added to the definition of "Dry condition" in adopted §298.355(2); and, the phrase, "and that is intended to represent the wettest periods" was added to the definition of "Wet condition" in adopted and renumbered §298.355(11). These phrases were added to clarify when these conditions would apply. In §298.355(3), (6), (9), and (12) the commission adopts definitions for the seasons, "Fall," "Spring," "Summer," and "Winter" because the adopted environmental flow standards for this basin and bay system vary by season. The definitions are the same as the definitions of the seasons in the recommendations of the science team, which were subsequently used by the stakeholders to develop their recommendations. In response to comment, the phrase, "for the measurement points listed in §298.330(c)" was added to the definition of "Spring" in adopted §298.355(6) and the definition of "Summer" in adopted §298.355(9) to clarify that these definitions apply to instream standards adopted in §298.330(c). In §298.355(4) the commission adopts a definition for "Inflow regime level" because the adopted freshwater inflow standards for San Antonio Bay and the Mission-Aransas Estuary include multiple levels of freshwater inflows that occur with specific frequencies. In §298.355(5) the commission adopts a definition for "Modeled permitting frequency" for use in water rights permitting for applications which increase the amount of water authorized to be stored, taken, or diverted as described in §298.10. In §298.355(7) the commission adopts a definition for "Sound ecological environment" for this basin and bay system. This adopted definition is based on the definition

recommended by the science team. Finally, in §298.355(8) the commission adopts a definition for "Strategy target frequency" to be used solely for the purpose of pursuing voluntary strategies to provide additional freshwater inflow to the bays and estuaries covered in this subchapter. In response to comment, the commission adopts new §298.355(10) to provide a definition of "Time period" to define occurrence frequencies for specific pulses at four measurement points as specified in the figures located in §298.330(c)(12)(B), (13)(B), (14)(B), and (15)(B) because those pulses are defined by time-period and this term is needed to help describe how pulse flow compliance for those pulses will be determined. As a result of this addition, the commission has renumbered paragraphs (10) - (11) in §298.355.

§298.360, Findings

The commission adopts new §298.360 regarding findings related to sound ecological environments. The adopted finding regarding the ecological environment is consistent with the science team and stakeholder reports. Information on the commission's reasoning for the adopted schedule of flow quantities and environmental flow standards can be found in this preamble under the analyses for §§298.370, 298.375, and 298.380. In response to comment, the commission added the word "variable" and the phrase "and that incorporate inflow and frequency targets at which specific levels of freshwater inflows occur, which are used for the sole purpose of providing additional freshwater inflows to Mission, Copano, Aransas, and San Antonio Bays through voluntary

strategies" to adopted §298.360(c) to acknowledge the importance of targets for implementation of strategies to provide additional freshwater inflows. This adopted new section would implement TWC, §11.1471.

§298.365, Set-Asides and Standards Priority Date

The commission adopts new §298.365 which establishes the priority date for any set-asides and any modeling of the environmental flow standards in the commission's WAMs as the date the commission received the report from the science team for the basin and bay system, which was March 1, 2011. The commission intends to protect high flow pulse standards by not permitting these flows to smaller applicants for new appropriations because under proposed §298.385(b), the high flow pulse standards would not be included in some water right permits for new appropriations. In addition, the commission needs to ensure that new appropriations, or amendments to add a new appropriation, will not affect downstream flow standards at measurement points that may not be applicable to those new appropriations or amendments. The commission also adds these changes to ensure consistency with adopted §298.20.

§298.370, Calculation of Hydrologic Conditions

The commission adopts new §298.370 to explain the determination of hydrologic conditions for implementation and application of the standards to water right permits to which the adopted standards apply. The method for determining hydrologic conditions,

for water right permits to which hydrologic conditions are applicable, for use as special conditions in those water right permits, is based on the recommendations of the stakeholders. Implementation of hydrologic conditions in the commission's WAMs, used in the availability determination for water rights permitting, for the river and coastal basins for which hydrologic conditions are applicable may result in different cumulative streamflows than those derived for the purposes of developing special conditions for a water right permit to which those hydrologic conditions are applicable. The commission's adopted rule provides that, for purposes of water availability determinations, hydrologic conditions used in the commission's WAMs will be calculated based on the period of record for the applicable WAM and using the applicable frequencies for hydrologic conditions recommended by the stakeholders and applied to the WAM simulated flows.

§298.375, Schedule of Flow Quantities

The commission adopts new §298.375 regarding the schedule of flow quantities. The commission adopts this section to explain the implementation of the environmental flow standards in the following section. The commission does not necessarily intend to use the exact wording of this section as the wording in water right permits issued after the adoption of these rules. However, this section describes how the commission intends to implement the adopted environmental flow standards in water right permits or amendments applications for new appropriations.

Subsistence flows are the minimum flows below which the commission will not allow diversions or storage of water. Therefore, the water right holder may not divert or store water if the flow at the applicable measurement point is below the subsistence flow standard. For measurement points in the Guadalupe River Basin, the commission adopts that if the flow at the applicable measurement point is above the subsistence flow standard but below the applicable base flow standard, the water right holder must allow the applicable subsistence flow, plus 50% of the difference between measured streamflow and the applicable subsistence flow, to pass its measurement point, and any remaining flow may be diverted or stored. For measurement points in the San Antonio River Basin and the San Antonio-Nueces Coastal Basin, during dry hydrologic conditions, if the flow at the applicable measurement point is above the subsistence flow standard but below the applicable dry base flow standard, the water right holder must allow the applicable subsistence flow, plus 50% of the difference between measured streamflow and the applicable subsistence flow, to pass its measurement points, and any remaining flow may be diverted or stored. The commission's adopted rule provides that the subsistence flow standard can be variable depending on the season, and that only the subsistence flow for a particular season limits diversions by a water right subject to the standards, in that season.

For measurement points in the Guadalupe River Basin, once the flow at the applicable

measurement point is above the base flow standard for the season, the water right holder may store or divert water according to its permit as long as the flow at the measurement point does not fall below the applicable base flow standard for that season. For measurement points in the San Antonio River Basin and the San Antonio-Nueces Coastal Basin, during average or wet hydrologic conditions, a water right holder may not store or divert water when the flow at the applicable measurement point is below the base flow standard for that season. Once the flow at the applicable measurement point is above the base flow standard for the season, the water right holder may store or divert water according to its permit as long as the flow at the applicable measurement point does not fall below the applicable base flow standard for that season and in accordance with the applicable hydrologic condition as set out in §298.370.

The commission's adopted rule provides that pulse flows be allowed to pass if streamflows are above the base or subsistence flow standard for the season, subject to the pulse flow exemption as described in §298.385(b) and if the pulse flow trigger level is reached at the measurement point. The adopted rule also provides that, for measurement points described in §298.380(c)(12) - (15), for large pulses, once the pulse flow trigger conditions are met, the water right owner may not store or divert water until the daily average flow is at or above the pulse flow trigger level and the applicable pulse duration has occurred. For all other measurement points and for small seasonal pulses

at measurement points described in §298.380(c)(12) - (15), once the pulse flow trigger conditions are met, the water right holder may not store or divert water until either the applicable pulse volume passes the applicable measurement point or the applicable pulse duration has occurred.

The adopted rule does not require that the water right holder be required to produce a pulse flow because pulses occur when there are high rainfall events. The commission does adopt that during these high rainfall events, the applicable high flow pulse be allowed to pass downstream. The commission's adopted rule provides that a water right holder on the San Antonio River or Cibolo Creek can divert water in excess of the applicable large pulse flow trigger requirement as long as those diversions do not prevent the occurrence of the pulse flow trigger level of the applicable large pulse and so long as the duration requirement is met for the applicable large pulse. The commission's adopted rule provides that a water right holder on the San Antonio River or Cibolo Creek can divert water in excess of the applicable small pulse flow trigger requirement as long as those diversions do not prevent the occurrence of the small pulse flow trigger level and as long as the duration or volume requirement is met for the applicable small pulse. The commission also adopts that all other water right holders can divert water in excess of the applicable pulse requirement so long as those diversions do not prevent the occurrence of the pulse flow trigger level of the applicable pulse and as long as the duration or volume requirement is met for the applicable pulse.

If, in a particular season, only one of the small seasonal high flow pulses identified in the commission's adopted rule is generated, there would be no need to "catch up" or allow more than the applicable number of high flow pulses to pass in the following season. There would also be no need to "catch up" or allow more than the applicable number of large seasonal high flow pulses to pass. In response to comment, for large seasonal pulses at measure points described in §298.380(c)(12) - (15), the commission adopts a provision that each time-period is independent of other time-periods with respect to high flow pulse frequency and adds the phrase "and each time-period is independent of each other time-period with respect to high flow pulse frequency" to adopted §298.375(d)(4). The commission agrees with the stakeholders that pulse flows not be tied to a hydrologic condition. In response to comment, the commission added the words "subsistence or" and the word "applicable" to adopted §298.375(d)(1) to clarify that pulse flows are not tied to hydrologic conditions and to clarify the references to pulse flow duration. At the August 8, 2012 commission agenda, the commission added an additional level of pulse flows to measurement points in the Guadalupe River Basin. The commission made conforming changes by adding the phrase "one or" to adopted §298.375(d)(1) and the phrase "Guadalupe River Basin, the" to adopted §298.375(d)(6). In addition, the adopted rule provides that if the pulse requirements for a large seasonal high flow pulse event are satisfied and therefore this high flow pulse is allowed to pass, the requirements for smaller seasonal high flow pulse events during that season would

be considered to be satisfied at the applicable measurement point.

The commission's adopted rule provides that if a water right owner stored water at a previous time and complied with the applicable environmental flow requirements at that time, the water right owner would not need to comply with any environmental flow requirements in effect when subsequent use of that stored water occurs.

§298.380, Environmental Flow Standards

The commission adopts new §298.380 to provide the environmental flow standards of TWC, §11.1471, for the basin and bay system composed of the Guadalupe, San Antonio, Mission, and Aransas Rivers, their associated tributaries, and Mission, Copano, Aransas, and San Antonio Bays. The commission based its decision on consideration of the recommendations of stakeholders, sound science, and other public interests and relevant factors.

The adopted bay and estuary standards for San Antonio Bay and the Mission-Aransas Estuary generally track the recommendations of the stakeholders. The commission agrees with the stakeholders that, for months where there is no freshwater inflow standard in the adopted rule, application of the proposed instream flow standards to water right applications subject to this subchapter should provide sufficient flow to the bays and estuaries. The stakeholders recognized the role of environmental flow

standards in both water rights permitting and in establishing targets for purposes of providing additional freshwater inflows through voluntary strategies. Based on this, the stakeholders recommended a dual set of recommendations for freshwater inflows. The stakeholders proposed that, for purposes of water availability determinations, specific frequency values based on the WAM in effect at the time they developed their recommendations be included in the proposed rule. However, the stakeholders recognize that the WAMs change as new permits and amendments are added and for other reasons. Therefore, the commission does not adopt specific frequencies for use in availability determinations in the proposed rule. The adopted rule provides that new permits or amendments to increase the amount of water stored, taken, or diverted shall not impair the frequency at which specific inflow regime levels occur by more than the values set out in §298.380(a)(3)(A) - (C) and (4)(A) - (C) as compared to the baseline values in the commission's WAMs in effect at the time the first application for a water right permit or amendment subject to this subchapter is considered. In response to comment, the commission removed the phrase "10%" and added the phrase, "the values set out in paragraphs (3)(A) - (C) and (4)(A) - (C) of this subsection". In response to comments, the commission added new §298.380(a)(1) and (2) to clarify how the allowable impairment will be calculated and applied in water availability determinations for new water rights or amendments subject to this subchapter and renumbered the remaining provisions. In response to comment, the commission added new §298.380(a)(3)(A) - (C) and (4)(A) - (C) to reduce the 10% allowable impairment, where

possible, to 5% or 8% depending on the specific inflow regime and to clarify how the allowable impairment will be calculated for each specific inflow regime.

The stakeholders also proposed that, for new appropriations greater than 200 acre-feet per year, each applicant should dedicate the lesser of 10% of the project yield or 10% of the authorized annual diversion to the environment to provide additional freshwater inflows to the bays and estuaries. The stakeholders further recommended that the commission, through rulemaking, form a stakeholder advisory group to advise the commission on the 10% dedication. HB 3/SB 3 contemplates that environmental flow standards will be protective of the environment. The commission is unable to require a 10% dedication of water to the environment by applicants for new appropriations. TWC, §11.0235(d) states, "The legislature has not expressly authorized granting water rights exclusively for: (1) instream flows dedicated to environmental needs or inflows to the state's bay and estuary systems; or (2) other similar beneficial use." Further, requiring this dedication would encourage applicants for new appropriations to request more water than they need. The commission's adopted standards are protective of the environment; therefore, the commission did not include a requirement for a 10% dedication, in the adopted standards and the adopted rule does not establish a stakeholder advisory group in this rulemaking. The commission's adopted rule further provides that if strategies are implemented through a water right permit to provide additional freshwater inflows to San Antonio Bay or the Mission-Aransas Estuary, any

subsequent new permits or amendments for new appropriations of water not be allowed to reduce the frequency at which inflow regime levels occur below the levels that would occur in the commission's WAM with the permitted strategy or strategies in place. In response to comment, the commission added the word "help" to adopted §298.380(b) to clarify its intent to protect incremental additional freshwater inflows resulting from voluntary permitted strategies.

The measurement points and the adopted base flow and subsistence flow standards for the San Antonio River Basin and the San Antonio-Nueces Coastal Basin are those recommended by the stakeholders; however, some flow values were rounded. In response to comment, the commission corrected a typographical error in the figure located in §298.380(c)(15)(A) to change the Fall dry base flow value from 367 cfs to 167 cfs. At the August 8, 2012 commission agenda, the commission increased the base flows for measurement points in the Guadalupe River Basin described in §298.380(c)(1) - (5) and (7), which provides additional flow for the environment. The adopted high flow pulse standards are generally based on recommendations of the stakeholders. At some locations, the stakeholders recommended pulse flows with durations in excess of one month. With the exception of the San Antonio River and Cibolo Creek, there was little site-specific information supporting specific high flow pulses, including pulses with long durations. Therefore, the commission did not include pulse flows with durations longer than 30 days in the adopted rule. The measurement points and the subsistence flow

standards for the Guadalupe River Basin are those recommended by the stakeholders. The base flow standards and pulse flow values were adjusted based on the balancing analysis discussed further. At the August 8, 2012 commission agenda, the commission added an additional level of pulse flows to measurement points in the Guadalupe River Basin, which provides additional flow for the environment.

The stakeholders performed an analysis of the impacts of the proposed standards on future water supply needs and considered the results of these analyses in their recommendations. The ED reviewed the information provided by the stakeholders. The ED also performed his own analysis to address the issue of balancing human and other competing needs for water in the basin and bay system. The ED's analysis is not intended as a finding that water is available for specific projects. When applications for projects are evaluated, water availability is based on specific facts in those applications.

The ED's selected scenario for the balancing analysis is based on a hypothetical diversion of a large amount of water from the Guadalupe River Basin. This amount of water, 135,000 acre-feet, is greater than the amount considered by the stakeholders but less than the amount identified in the Regional Water Plan as necessary for future human water needs. For this evaluation, the ED used the commission's WAM for the Guadalupe river basin and modified it by adding the selected scenario. The ED performed analyses to estimate water availability under four conditions: 1) no

environmental flow requirements; 2) application of the commission's current default methodology; 3) application of the stakeholders' recommendation; and, 4) application of the adopted environmental flow standard. This analysis is intended to address the impacts of different environmental flow conditions on diversions of water from the river and therefore does not include a storage component. Applying either no instream flow requirement or the default methodology produces annual availabilities of 59% and 30%, respectively. Application of the stakeholders' recommendation and of the adopted standards produces annual availabilities of less than 5% and 25%, respectively. Annual availability is the percentage of time that the annual diversion requirement is met from river diversions. In response to comments, the ED also performed the four analyses at a more downstream location, United States Geological Survey (USGS) gage 08173900, Guadalupe River at Gonzales. Applying either no instream flow requirement or the default methodology produces annual availabilities of 75% and 63%, respectively. Application of the stakeholders' recommendation and of the adopted standards produced annual availabilities of 50% and 60%, respectively. The ED applied the adopted standards for San Antonio Bay and found that application of the standards, as adopted in the rule, did not impact water availability for the scenario. Copies of the WAMs used in this analysis are available at:

<http://www.tceq.texas.gov/goto/eflows/rulemaking>.

The ED performed water quality analyses to evaluate relationships between streamflow

and the water quality parameters identified by the science team and to look for trends and criteria excursions. These analyses did not identify any areas of concern that need to be addressed through this rulemaking process. The ED also considered whether reduction of the adopted standards would result in a significant increase in the amount of water available for the scenario and found that it did not. Based on the results of these analyses, the ED determined that there would be no significant impact from implementation of the adopted standards.

The adopted rule does not set aside any unappropriated water to protect the adopted environmental flow standards. Any unappropriated water that is available in these river basins is available only during relatively wet conditions. The environmental flow standards may be adequately protected by special conditions in water right permits or amendments for new appropriations of water in these basins. Special conditions are a more effective method to maximize the use of water by allowing water to be used for dual purposes. Special conditions to protect environmental flows may allow water permitted to downstream senior water rights, as well as return flows and permitted but unused water, to satisfy the special conditions. This adopted new section would implement TWC, §11.1471.

§298.385, Water Right Permit Conditions

The commission adopts new §298.385 relating to water right permit conditions. The

adopted provision would require the commission to place special conditions in water right permits for new appropriations and amendments that would add additional appropriations to existing permits. The special conditions would be to protect the environmental flow standards established by the subchapter. Consistent with the recommendations of the stakeholders, the adopted rule provides that, for water right permit applications where the diversion rate is less than 20% of a pulse flow trigger requirement, the water right permit or amendment would not include special conditions relative to that high flow pulse. This adopted new section would implement TWC, §11.134(b)(3)(D) and §11.1471.

§298.390, Schedule for Revision of Standards

The commission adopts new §298.390 to provide the schedule for re-examination of the environmental flow standards. The adopted rule requires that the commission take up a possible rulemaking to change the standards ten years from the effective date of the rules, unless the stakeholder committee submits a work plan approved by the Advisory Group that calls for a more frequent review. The commission notes that it is prohibited from providing that the rulemaking process occurs more frequently than once every ten years unless the stakeholders' work plan approved by the Advisory Group under TWC, §11.02362(p), calls for a more frequent schedule. The commission notes that, as of the time of adoption of these rules, it has not received an approved work plan from the stakeholder committee. Should the commission receive an approved work plan after

final adoption of this rule package, the commission is free to consider an amendment to this section and change the schedule more often than once every ten years. The adopted new section would implement TWC, §11.1471(f).

Final Regulatory Impact Determination

The commission evaluated these adopted rules and performed an analysis of whether these adopted rules require a regulatory impact analysis under Texas Government Code, §2001.0225. These rules are not a "major environmental rule" under Texas Government Code, §2001.0225 because although the specific intent of the rulemaking is to protect the environment, these rules do not potentially adversely affect in a material way the economy, or a sector of the economy. Also, the purpose of these rules is not to exceed a standard set by federal law, exceed an express requirement of state law, exceed a requirement of a delegation agreement or contract between the state and an agency of the federal government to implement a state and federal program, or to adopt rules solely under the general powers of the agency instead of specific state law. This rulemaking is specifically required by TWC, §11.1471. The purpose of these rules is to establish environmental flow standards and set-asides for the Colorado and Lavaca Rivers, their associated tributaries, and Matagorda and Lavaca Bays; and the Guadalupe, San Antonio, Mission and Aransas Rivers, their associated tributaries, and Mission, Copano, Aransas, and San Antonio Bays as required by TWC, §11.1471(a). These rules also implement TWC, §11.02362(p) and §11.1471(f), to revise the schedule for review of

the existing standards for the Sabine and Neches Rivers and Sabine Lake Bay.

Therefore, no regulatory impact analysis is required under Texas Government Code, §2001.0225 for this rulemaking.

The commission invited public comment regarding the draft regulatory impact analysis determination during the public comment period. No comments were received.

Takings Impact Assessment

The commission evaluated these adopted rules and performed analysis of whether these adopted rules constitute a takings under Texas Government Code, Chapter 2007. The specific purpose of these rules is to establish environmental flow standards and set-asides for the Colorado and Lavaca Rivers, their associated tributaries, and Matagorda and Lavaca Bays; and the Guadalupe, San Antonio, Mission, and Aransas Rivers, their associated tributaries, and Mission, Copano, Aransas, and San Antonio Bays, as expressly required by TWC, §11.1471(a). These rules also implement TWC, §11.02362(p) and §11.1471(f), to revise the schedule for review of the existing standards for the Sabine and Neches Rivers and Sabine Lake Bay. Promulgation and enforcement of these adopted rules would be neither a statutory nor a constitutional taking of private real property. Specifically, because under TWC, §11.147(e-1), these rules cannot be retroactively applied to water rights issued after September 1, 2007, the subject adopted regulations do not affect a landowner's rights in private real property. Thus, this

rulemaking does not burden (constitutionally); nor restrict or limit the owner's right to existing property and reduce its value by 25% or more beyond that which would otherwise exist in the absence of the regulations.

Consistency with the Coastal Management Program

The commission reviewed the adopted rulemaking and found that the proposal is subject to the Texas Coastal Management Program (CMP) in accordance with the Coastal Coordination Act, Texas Natural Resources Code, §§33.201 *et. seq.*, and, therefore, must be consistent with all applicable CMP goals and policies. The commission conducted a consistency determination for the adopted rules in accordance with Coastal Coordination Act Implementation Rules, 31 TAC §505.22, and found the adopted rulemaking is consistent with the applicable CMP goals and policies.

CMP goals applicable to the proposed rules include: 1) to protect, preserve, restore, and enhance the diversity, quality, quantity, functions, and values of coastal natural resource areas; and, 2) to ensure sound management of all coastal resources by allowing for compatible economic development and multiple human uses of the coastal zone. CMP policies applicable to the proposed rules include those contained in 31 TAC §501.33. The adopted rules implement HB 3/SB 3, which established the environmental flows process to provide certainty in water management and development and to provide adequate protection of the state's streams, rivers, bays, and estuaries. Since one of the purposes

of the adopted rules is to protect coastal natural resources, the rules are consistent with CMP goals and policies.

Promulgation and enforcement of these rules will not violate or exceed any standards identified in the applicable CMP goals and policies, because the adopted rules are consistent with these CMP goals and policies, because these rules do not create or have a direct or significant adverse effect on any coastal natural resource areas, and because one of the purposes of the adopted rules is to protect coastal natural resources.

The commission invited public comment regarding the consistency with the CMP during the public comment period. No comments were received.

Public Comment

The commission held a public hearing on May 8, 2012. The comment period closed on May 14, 2012. The commission received comments from the: Aransas County Commissioners Court (ACCC); Aransas County Navigation District (ACND); Audubon Texas; Bexar Audubon Society; Calhoun County Commissioners Court (CCCC); Citizens Alliance for Responsible Development (CARD); Coastal Conservation Association Texas (CCA); Cow Creek Groundwater Conservation District (Cow Creek GCD); Environmental Stewardship (ES); Greater Edwards Aquifer Alliance (GEAA); Guadalupe San Antonio Basin and Bay Stakeholder Committee (GSA BBASC);

Guadalupe-Blanco River Authority (GBRA); Guadalupe River Trout Unlimited (GRTU); Hill Country Alliance (HCA); International Crane Foundation (ICF); Lower Colorado River Authority (LCRA); TCEQ's Office of Public Interest Counsel (OPIC); San Antonio River Authority (SARA); San Marcos River Foundation (SMRF); National Wildlife Federation and the Lone Star Chapter of the Sierra Club (NWF and Sierra Club-Lone Star); Texas Parks and Wildlife Department (TPWD); United States Fish and Wildlife Service (USFWS); Upper Guadalupe River Authority (UGRA); City of Victoria (Victoria) and 2,757 individuals.

Generally, GBRA, UGRA, Victoria, CCCC, and five individuals support the rule.

Generally, ES, OPIC, NWF and Sierra Club-Lone Star and LCRA supported portions of the rule. Generally, ACCC; ACND; Audubon; Bexar Audubon; CARD; CCA; Cow Creek GCD; GEAA; GSA BBASC; GRTU; HCA; ICF; SARA; SMRF; TPWD; USFWS and 2,752 were against the rule. NWF and Sierra Club-Lone Star were opposed to Subchapter E. NWF and Sierra Club-Lone Star, and LCRA suggested specific changes to the rule as noted in the Response to Comments section of this preamble.

Response to Comments

Public Benefit and Costs

GBRA commented that the findings of the public benefit and costs analysis conducted in conjunction with these proposed rules found, in part, the following: "Because the

proposed standards are expected to function similarly to current streamflow restrictions for applications, the proposed standards are not expected to have significant fiscal implications for units of state or local government including river authorities, cities, or water districts." This finding is likely inaccurate if the impacts upon water planning are considered. The SB 1 water planning process works with a 50-year horizon. Because the water planning process must consider all relevant rules and regulations, it is very likely that numerous long-term projects, such as importing water across basin divides or developing new reservoirs - strategies that are paramount to meeting anticipated demands - will be significantly impacted. This could result in large water deficits with significant economic impacts. GBRA therefore urges the commission to recognize the full measure of unintended consequences of environmental flow standards on the legislatively mandated water planning process.

The commission responds that applications for new appropriations of water currently receive flow restrictions based on their location and facts provided in the application. Similarly, an application for a new appropriation of water under these rules will receive streamflow restrictions as provided by the adopted rules. The primary difference between streamflow restrictions assigned under the existing desktop methodology and streamflow restrictions assigned under the adopted rule is how the flows for the environment are distributed throughout the year.

Because streamflow restrictions currently applied to new appropriations of water under existing practice and streamflow restrictions under the proposed standards are expected to function similarly, the proposed standards are not expected to have significant fiscal implications. Additionally, under HB 3/SB 3's adaptive management provisions, the stakeholders will have future opportunities to re-evaluate the issue of balancing human and other competing needs for water in the bay and basin systems. The commission also notes that the fiscal note in the rule proposal preamble is limited by statute to a five-year outlook.

General

One thousand, four-hundred and twenty-eight individuals asked TCEQ to adopt environmental flow standards consistent with those in the environmental flow recommendations reports put forward by the Colorado and Lavaca Rivers/Matagorda and Lavaca Bays area Stakeholder Committee and the Guadalupe, San Antonio, Mission and Aransas Rivers/Mission, Copano, Aransas, and San Antonio Bays area Stakeholder Committee. These individuals commented that the recommendations developed by the two stakeholder groups represent a carefully crafted compromise that balances the need for sustaining a healthy environment and providing sufficient supply of water for human needs. These individuals also commented that failure to recognize and adopt these recommendations only invites continued conflicts over Texas water resources.

The commission responds that it considered the science team recommendations, the SAC's review of those recommendations, and the stakeholder recommendations. However, the commission respectfully disagrees that it had to adopt the stakeholder recommendations in their entirety because SB 3 clearly provides that the commission perform its own review of the stakeholders' recommendations. As provided in TWC, §11.02362(o), the stakeholders develop recommendations, not final environmental flow standards, and send their recommendations to the commission. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." The commission is required to perform its own review based on several factors, including human needs. However, the commission has adopted many of the stakeholders' recommendations in both basin and bay systems. At the August 8, 2012 commission agenda, the commission added an additional level of pulse flows to measurement points in the Guadalupe River Basin and increased the base flow values for measurement points in the Guadalupe River Basin described in §298.380(c)(1) - (5) and (7).

One thousand, four-hundred and twenty-four individuals commented that Texas must develop creative solutions for protecting our natural heritage while simultaneously allowing water development to occur. These individuals further commented that the Texas Legislature created the environmental flows process to bring Texans together to develop these creative solutions.

The commission responds that it followed the process created by the Texas Legislature in TWC, §11.1471, to determine these flow standards. It considered all of the recommendations provided by the science team and the stakeholder groups and other relevant factors, when drafting the adopted rules. No change has been made in response to this comment.

One thousand, four-hundred and twenty-seven individuals commented that disregarding the stakeholders' carefully crafted recommendations not only fails to capitalize on creative solutions, it undermines the entire environmental flows process and disregards the legislative intent of the environmental flows process - to move Texas forward.

The commission did not disregard the science team recommendations, the SAC's review of those recommendations, or the stakeholder recommendations, but considered all of them. However, the commission

respectfully disagrees that it had to adopt the stakeholder recommendations in their entirety because SB 3 clearly provides that the commission perform its own review of the stakeholders' recommendations. As provided in TWC, §11.02362(o), the stakeholders develop recommendations, not final environmental flow standards, and send their recommendations to the commission. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." The commission is required to perform its own review based on several factors, including human needs. However, the commission has adopted many of the stakeholders' recommendations in both basin and bay systems. The rule was not changed in response to this comment.

One thousand, two-hundred and ninety-three individuals commented that the proposed rule on environmental water flows for the Colorado and Lavaca Rivers/Matagorda Bay area and the Guadalupe and San Antonio Rivers/San Antonio Bay area must not be adopted as currently written. The rule falls unreasonably short of providing the environmental protections that these rivers and bays need to remain healthy and productive. Adoption of this proposal would worsen existing challenges these waterways face by allowing additional water withdrawals at times when the rivers and

bays, and wildlife that depend on them, most need sufficient flows.

The commission followed its instructions in TWC, §11.1471, to determine these flow standards. It considered all of the recommendations provided by the science team and the stakeholder groups and other relevant factors, including commission staff's water availability analyses, when drafting the adopted rules. The commission believes that the adopted rules are sufficiently protective of the environment because they include a flow regime with subsistence, base, and pulse flows and also include freshwater inflow standards. The numerical values for these flow regime components are based on the values in the stakeholder reports. Under SB 3's adaptive management provisions, further analyses and studies will be performed in the future to determine whether the adopted standards, once implemented, continue to protect the environment. No change has been made in response to this comment.

One thousand, two hundred and ninety-two individuals commented that TCEQ must adopt a rule that is no less protective than the stakeholder committees' recommendations. The recommendations already include many environmental compromises that were agreed upon to balance human water supply needs with those of the environment. TCEQ's rationale for weakening the protections is insufficient. These

commenters urged TCEQ to adopt the full suite of stakeholder recommended protections and nothing less.

The commission did not disregard the science team recommendations, the SAC's review of those recommendations, or the stakeholder recommendations, but considered all of them. However, the commission respectfully disagrees that it had to adopt the stakeholder recommendations in their entirety because SB 3 clearly provides that the commission perform its own review of the stakeholders' recommendations. As provided in TWC, §11.02362(o), the stakeholders develop recommendations, not final environmental flow standards, and send their recommendations to the commission. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." The commission has adopted many of the stakeholders' recommendations in both basin and bay systems. The rule was not changed in response to this comment.

Two individuals requested that the TCEQ ban all coal fired and nuclear powered electric power plants because they pollute air and water in wetlands and bays and lakes but also

because they waste water. The commenters stated that TCEQ should stop future nuclear power plant construction which costs taxpayers huge sums in loan guarantees and subsidies. The commenters suggested that TCEQ should instead adopt a Texas natural gas, wind, solar, and geothermal energy policy for Texas that would make Texas a world leader in those clean energy industries not to mention increased lasting jobs, increased state tax revenue, energy independence, increased national security, and decreased health care costs. The individuals commented that TCEQ's present water use and flow plans which ignore the key environmental and water flow protections of the Guadalupe River/San Antonio Bay Committees will only serve to exacerbate the previously described damage to our wetlands and bays by coal fired power plants.

The commission responds that this rulemaking adopts environmental flow standards that will be used in water rights permitting for new appropriations of water and does not address energy solutions. Further, the commission respectfully disagrees that it had to adopt the stakeholder recommendations in their entirety because SB 3 clearly provides that the commission perform its own review of the stakeholders' recommendations. As provided in TWC, §11.02362(o), the stakeholders develop recommendations, not final environmental flow standards, and send their recommendations to the commission. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are

adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." The commission was also required to consider other factors, including human needs. However, the commission has adopted many of the stakeholders' recommendations in both basin and bay systems. The rule was not changed in response to this comment.

One individual commended the ED's staff in their efforts to incorporate the intent of SB 3 by attempting to develop a balanced standard that considers the needs of the environment, along with the needs for water for other human uses. The commenter stated that developing such a standard is hard, difficult work, and the staff's efforts are greatly appreciated.

The commission acknowledges this comment.

One individual commented that cities, industries, farmers, ranchers, and riverside landowners, plus coastal fishermen, both commercial and recreational are dependent on the water flows and have put forward recommendations that protect the rivers while ensuring there is water for industrial and municipal needs.

The commission agrees that instream flows and inflows to bays and

estuaries are important to the health of river and bay systems. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." The commission has adopted many of the stakeholders' recommendations in both basin and bay systems. The rule was not changed in response to this comment.

Twenty-three individuals commented on the impact of the proposed rules on Roseate Spoonbills and other shorebirds. Five of these individuals commented that freshwater inflows are important to protect these birds and their habitat. Five of these individuals commented that protection of these birds is important for tourism and the economy. Eight of these individuals requested that TCEQ protect these birds and their habitat. One of these individuals commented that TCEQ should help the Roseate Spoonbill by not adopting the rule as written.

The commission acknowledges that healthy bay systems are important for economic and ecological reasons. The commission included freshwater inflow standards in the adopted rule for the protection of bays and estuaries. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound

ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." The commission considered all of the recommendations provided by the science team and the stakeholder groups and other relevant factors, when drafting the adopted rules. The commission believes that the adopted rules are sufficiently protective of the environment because they include a flow regime with subsistence, base, and pulse flows and also include freshwater inflow standards. The numerical values for these flow regime components are based on the values in the stakeholder reports. Under SB 3's adaptive management provisions, further analyses and studies will be performed in the future to determine whether the adopted standards, once implemented, continue to protect the environment. The commission notes that it has adopted many of the stakeholders' recommendations in both basin and bay systems. No change was made in response to this comment.

Ten individuals commented on the importance of Texas' natural resources, including wildlife, rivers, bays, and wetlands. One of these individuals commented that healthy plants and wildlife require water. Four of these individuals commented that TCEQ should protect the environment.

The commission responds that this rulemaking adopts environmental flow

standards that will be used in water rights permitting for new appropriations of water. The commission acknowledges the importance of Texas' natural resources. The commission also agrees that instream flows are important to the health of river systems. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." The commission has adopted many of the stakeholders' recommendations in both basin and bay systems. The rule was not changed in response to this comment.

Sixteen individuals commented that TCEQ should protect the environment. Two of these individuals commented that the proposed rules do not provide enough water to maintain the environment in the future. Two of these individuals commented that TCEQ should adopt rules that protect the environment in the future. One of these individuals commented that the TCEQ should consider long-term sustainable protection of wetlands and the interconnectedness of these ecosystems in water flow determinations. One of these individuals commented that no one can predict the unintended and unforeseen consequences our actions will cause. Five individuals commented that TCEQ should do what is best for the environment. One of these individuals commented that humans need to share the water with birds and other

wildlife. One of these individuals commented that the environment should be protected for all of us. One of these individuals commented that if the environment is ruined, Texas will not be as great as it could be.

The commission acknowledges the comments and responds that the adopted rule applies to environmental flow standards for new applications to store, divert, or take state surface water. The commission believes that the adopted rules are sufficiently protective of the environment because they include a flow regime with subsistence, base, and pulse flows and also include freshwater inflow standards. The numerical values for these flow regime components are based on the values in the stakeholder reports. SB 3 also added TWC, §11.02362(p), which recognized the importance of adaptive management and provided that after submitting its recommendations regarding environmental flow standards and strategies to meet the environmental flow standards to the commission, each stakeholder committee prepare and submit a work plan. Issues related to wetlands and their connectedness to rivers and bays can be considered by the stakeholders in their development of a work plan. No change was made in response to this comment.

Twenty-three individuals commented that TCEQ should adopt the stakeholders'

recommendations. One of these individuals commented that partial protection is not sufficient. One of these individuals commented that TCEQ should adopt rules that are as or more protective than the stakeholders' recommendations. Four of these individuals commented that the stakeholders spent a lot of time and effort to develop recommendations that balance environmental and human water needs.

The commission is very aware of the dedication of time and money and the concern for maintaining healthy rivers and bays exhibited by the stakeholder committee. Neither the commission nor its staff takes this significant contribution lightly. The commission responds that it followed the process created by the Texas Legislature in TWC, §11.1471, to determine these flow standards. SB 3 clearly provides that the commission perform its own review of the stakeholders' recommendations. As provided in TWC, §11.02362(o), the stakeholders develop recommendations, not final environmental flow standards, and send their recommendations to the commission. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." In drafting the adopted standards, the commission considered all of the recommendations provided by the science team and the stakeholder groups and other relevant

factors, including commission staff's water availability analyses. The commission is required to balance needs for the environment with other needs including human water needs. The commission notes that it has adopted many of the stakeholders' recommendations in both basin and bay systems. No change has been made in response to this comment.

Twenty individuals commented that TCEQ disregarded the stakeholders' recommendations. Three of these individuals commented that disregarding the stakeholder recommendations is not a democratic process. Four of these individuals commented that TCEQ did not follow the statute in developing its proposed rules. One of these individuals commented that the preferred strategy for water management is a stakeholder process and disregarding the stakeholders breaks with this policy. One of these individuals commented that by not honoring the stakeholder recommendations, TCEQ will not be protecting bays, estuaries, and wildlife. Five of these individuals commented that disregarding the stakeholders' recommendations ignores the time and effort the stakeholder's spent in developing their recommendations.

The commission responds that it followed the process created by the Texas Legislature in TWC, §11.1471, to determine these flow standards. It considered all of the recommendations provided by the science team and the stakeholder groups and other relevant factors, when drafting the

adopted rules. The commission is very aware of the dedication of time and money and the concern for maintaining healthy rivers and bays exhibited by the stakeholder committees. Neither the commission nor its staff takes this significant contribution lightly. SB 3 clearly provides that the commission perform its own review of the stakeholders' recommendations. As provided in TWC, §11.02362(o), the stakeholders develop recommendations, not final environmental flow standards, and send their recommendations to the commission. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." The commission has adopted many of the stakeholders' recommendations in both basin and bay systems. The rule was not changed in response to this comment.

Seventeen individuals commented that TCEQ should balance environmental and human needs. One of these individuals commented that agricultural and industrial users are not the primary concerns and the environment should be considered first. Three of these individuals commented that TCEQ should protect coastal areas from upstream users. One of these individuals commented that TCEQ should adopt rules that avoid environmentally-threatening compromises. One of these individuals commented that

TCEQ's proposed rules would not provide sufficient protection and would undermine the efforts of the legislature and the stakeholders to balance human water needs while protecting rivers and bays and the jobs they support. One of these individuals commented that river baseflow is critically important for many reasons including tourism, recreation, and protecting the natural environment both in the rivers and the bays. This individual also commented that there are other demands on the water but the state mandated stakeholder process is a good way to determine the proper balance between competing interests. One individual commented that TCEQ is making the right decision to protect water for humans, and not dedicating it for the fish and shellfish. One of these individuals commented that the rule proposal fails to provide sufficient inflow to protect river and bay resources and to provide recreation and other economic uses.

The commission acknowledges that healthy rivers and bays are important for recreation, economic, and ecological reasons. In developing the adopted rule, the commission followed its instructions in TWC, §11.1471, by balancing human and other competing needs for water with the scientific recommendations. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." In drafting

the adopted standards, the commission considered all of the recommendations provided by the science team and the stakeholder groups and other relevant factors, including commission staff's water availability analyses. The commission is required to balance needs for the environment with other needs including human water needs. The commission notes that it has adopted many of the stakeholders' recommendations in both basin and bay systems. No change has been made in response to this comment.

NWF and Sierra Club-Lone Star acknowledge that, for the Colorado and Lavaca Basins, most of the core components of the unanimous stakeholder recommendations are reflected in the proposed rules and appreciate the efforts of TCEQ staff to incorporate those aspects into the proposed rules. These commenters note, however, that even there, some critically important protections are missing, and, for the Guadalupe and San Antonio Basins, the differences between the stakeholder recommendations and the proposed rules are quite massive.

The commission followed its instructions in TWC, §11.1471, to determine these flow standards. It considered all of the recommendations provided by the science team and the stakeholder groups and other relevant factors, including commission staff's water availability analyses, when drafting the adopted rules and does not believe that the differences from the adopted

rules are massive. The commission is required to balance needs for the environment with other needs including human water needs. The balancing process in areas with demonstrated future human needs can result in more consideration being given to those needs. However, the commission further responds that the adopted standards are protective of the environment and allow for some future permitting. Additionally, the existence of more scientific data which supports complex recommendations can result in more consideration being given to those recommendations. Under SB 3's adaptive management provisions, further analyses and studies will be performed in the future to determine whether the adopted standards, once implemented, continue to protect the environment. Additionally, under these adaptive management provisions, the stakeholders will have future opportunities to re-evaluate the issue of balancing human and other competing needs for water in the bay and basin systems. The rule was not changed in response to this comment, although the commission does note that §§298.290, 298.305, 298.310, 298.320, 298.325, 298.330, 298.335, 298.355, 298.375, and 298.380 were modified in response to other comments. In addition, at the August 8, 2012 commission agenda, the commission added an additional level of pulse flows to measurement points in the Guadalupe River Basin and increased the base flow values for measurement points in the Guadalupe River Basin

described in §298.380(c)(1) - (5) and (7).

NWF and Sierra Club-Lone Star commented that TCEQ's proposed rules for the Guadalupe/San Antonio and Colorado/Lavaca bay and basin areas do not comply with the SB 3 / HB 3 statutory requirements for the agency's development of environmental flow standards for these bay and basin areas. These commenters specified that if the proposed standards are not shown to be adequate to protect a sound ecological environment, there must be adequate justification demonstrating that providing greater protection would not be reasonable because of the adverse impact to other public interests. These commenters stated that as the legislature has expressly noted, "{m}aintaining the biological soundness of the state's rivers, lakes, bays, and estuaries is of great importance to the public's economic health and general well being."

The commission recognizes the importance of protecting environmental interests for the "public's economic health and general well-being." The commission takes very seriously its charge from the legislature to provide to the extent practicable for freshwater inflows and instream flows necessary to maintain the viability of the state's streams, rivers, and bay and estuary systems. The legislature has recognized that these environmental interests must be balanced by the commission with "all other public interests." It is not possible or practicable to catalog a precise

weighing of countervailing interests that went into the commission's decision and is not required by statute. However, as explained elsewhere in this preamble, one of the important factors for the commission was to preserve the ability to permit at least some future surface water projects for human needs. The commission has provided a more complete explanation of its decision in this preamble. The commission has made some changes in response to comment as discussed in this preamble. In addition, at the August 8, 2012 commission agenda, the commission added an additional level of pulse flows to measurement points in the Guadalupe River Basin and increased the base flow values for measurement points in the Guadalupe River Basin described in §298.380(c)(1) - (5) and (7). The commission declines to make further changes.

NWF, Sierra Club-Lone Star, OPIC, and CCA comment that TCEQ has not fulfilled the statutory directive to set aside unappropriated water to protect the proposed environmental flow standards. The commenters recommend that the rules adopt set-asides, although no commenter suggested specific set-aside values. In the commenters' view TCEQ's justification is inadequate. In the absence of a demonstration that special conditions can reliably satisfy applicable environmental flow standards, environmental flow set-asides are needed. One particular value of environmental flow set-asides is that they establish an affirmative right for environmental flow protection with a priority date

that would allow TPWD to act in the role of a water right holder to enforce the right and to make a priority call for that water. If the commission does not establish environmental flow set-asides at this time, it will be critical for the commission to acknowledge and respect the availability determinations noted in the proposed rules in future water rights permitting decisions in order to retain and protect its ability to meaningfully revisit the issue of establishing environmental flow set-asides during the first revision process for these standards. The NWF and Sierra Club-Lone Star recognize that neither BBASC included a recommendation for set-asides. However, in the absence of the adoption of flow standards at least as protective as the recommendations of the BBASCs, TCEQ certainly has not justified its failure to establish environmental flow set-asides.

OPIC points out that TWC, §11.1471(a)(2), states that "the commission by rule shall . . . establish an amount of unappropriated water, if available, to be set aside to satisfy the environmental flow standards to the maximum extent reasonable when considering human water needs." Only if the use of set-asides does not meet the flow standards should the commission then look to market approaches and other means of preserving water for environmental flows under TWC, §11.0235(d-3)(2). Without set-asides, the commission has not fully implemented the legislature's mandate. The proposal declines to include set-asides because the flow standards are protective of a sound ecological environment. Yet, set-asides are a mechanism used to achieve environmental flow

standards, not the standards themselves, as demonstrated by the language in TWC, §11.1471(a)(2), that available unappropriated water must be set aside "to satisfy the environmental flow standards." Thus, the question of whether the standards are protective is a separate question from how to meet the standards. Although flexibility is generally an important goal, a preference for special conditions is not a justification allowed by TWC, §11.1471(a)(2), and should not be used as a basis for declining to set aside water. The "human water needs" limitation on set-asides refers to the appropriate amount of the set-aside, not whether it is appropriate to establish them at all. The flexibility provided by special conditions is exactly what set-asides are designed to prevent, in OPIC's view.

In the CCA's view the set-aside to satisfy environmental flow standards, can be reduced only to the extent required by one or more of the TWC, §11.1471(a)(1), factors, out of "unappropriated water, if available." In their view the question of whether there is "unappropriated water" available is a question for when there is a permit application claiming that there is unappropriated water available. The only reduction in the set-aside that the TCEQ is authorized to adopt by rule now is down to the "maximum extent reasonable when considering human water needs." If the TCEQ considers a reduction in the science-based set-aside necessary because of anticipated human water needs for which no permit application has even been filed, it must explain what those anticipated human water needs are, and why they are reasonably anticipated, and why they require

a maximum set-aside below the science-based set-aside. "Human water needs" is narrower language than "other public interests and other relevant factors." The commission's reductions in set-asides must be based on future additional "human water needs," in the view of the CCA.

The commission respectfully disagrees that set-asides are mandated if the commission finds that there is any amount of water available at any time. The commission does not interpret SB 3 to mean that all water available for appropriation up to the amount of the standard must be set aside. TWC, §11.1471(a)(2), provides that the commission determine whether "an amount" of unappropriated water should be set aside.

Even assuming that water is available for a set-aside, TWC, §11.1471(a)(2), qualifies the requirement for a set-aside as "to the maximum extent reasonable when considering human water needs." In these basins the commission has determined that set-asides are not reasonable because of limited water availability. Because of water availability issues in these basins, special conditions placed in a permit are a more effective method to protect flows in the stream when new appropriations of water are granted while providing water for future human needs. This is because if special conditions are used there are other sources of water in a stream that could

be used to meet environmental flow requirements in a permit; for example, water appropriated to downstream water right holders, water appropriated to another but not used, or return flows. Additionally, set-asides require a water availability determination, and these sources would not be used to determine water availability because they would not be considered to be unappropriated water.

The commission is only determining in this rulemaking to not establish set-asides at this time for these basins. After gaining further experience with implementation of environmental flows standards, as part of the adaptive management process, the commission is willing to revisit the issue. The commission recognizes the value of the ability of TPWD to enforce a set-aside. However, because of the necessity of leaving the ability to utilize some of the remaining unappropriated water in the basin for human water needs, the commission declines to establish any set-asides.

The commission recognizes that the preference for special conditions is not a named factor in TWC, §11.1471(a)(2), for not having a set-aside. However, the ability of special conditions to meet the environmental flow standard while at the same time allowing water to be available for appropriation makes the use of special conditions a more reasonable approach to

protecting the environmental flow standards considering human water needs.

The commission respectfully disagrees that the availability determination would be made, not at the time of the rulemaking, but later during a determination on a permit application. If availability decisions were made later the commission might set aside water to meet the standard when in fact no water was available. In that situation the commission would not know if it had struck the appropriated balance between environmental needs and other public interests until a permitting hearing where the commission would learn that no water was available for human water needs because all unappropriated water had been set aside in its rulemaking. The plain language of the statute means that a set-aside can occur only if unappropriated water is available. The commission notes that the state and regional water plans for Guadalupe and San Antonio basins call for future development of surface water projects to meet human water needs within the 50-year planning horizon. No change was made in response to these comments.

OPIC commented that the proposal appears to rely on an assumption that HB 3/SB 3 requires the commission to make water available for appropriation for human water

needs. Under TWC, §11.0235(c) and §11.1471(b), the commission must consider a variety of factors, including environmental needs, the public interest, human water needs, and economic factors, when establishing the flow standards. OPIC commented that under TWC, §11.02362(o), the stakeholders must also engage in the same balancing analysis. OPIC commented that HB 3/SB 3 does not require the commission to make water available for appropriation at the expense of environmental needs. OPIC commented that the amendment to TWC, §11.023(a) states, "To the extent that state water has not been set aside by the commission under Section 11.1471(a)(2) to meet downstream instream flow needs or freshwater inflow needs, state water may be appropriated, stored, or diverted for {various purposes}." This language makes clear that the legislature contemplated in some instances an absence of water available for appropriation after the use of set-asides.

The commission responds that although it must consider human needs in this rulemaking it is not specifically required by statute to make water available for appropriation. However, the commission, in the exercise of its discretion under the statute, believes that it is more appropriate to maximize the use of every drop of water to benefit both the environment and other public interests. Further, the commission has determined that for this basin, after the appropriate balance including consideration of environmental needs and other human water needs, the standards adopted

today are the most appropriate. The commission does not believe that its consideration of future human water needs has significantly reduced the adopted environmental flow standards because the adopted rule includes a flow regime consisting of subsistence flow, base flow, and high flow pulses, as well as freshwater inflow standards. In addition, the commission notes unappropriated water that is available in these river basins is available only during relatively wet conditions. Based on the fact that unappropriated water is limited, the environmental flow standards may be adequately protected by special conditions in water right permits or amendments for new appropriations of water in these basins. The rule was not changed in response to this comment.

OPIC recommends some changes related to the commission's process for incorporating stakeholder committee recommendations into proposed rules. Because the process for establishing environmental flow standards is new, somewhat unique in Texas law, and requires stakeholders to spend significant time and money, OPIC recommends the ED go beyond the minimum Administrative Procedures Act requirements and provide a more detailed explanation of changes in the proposal, with accompanying scientific or policy justifications for deviations from the stakeholder report. OPIC commented that greater detail in the proposal may prevent future conflicts over the ED's decisions to include, reject, or modify stakeholder recommendations.

The commission acknowledges and appreciates the significant dedication of time and money and the concern for maintaining healthy rivers and bays exhibited by the stakeholder committees in developing their recommendations. The commission agrees that it is important to explain its rationale in drafting proposed rules. Commission staff provided detailed information and explanations of the modeling, science, and balancing, including a discussion of the differences in the models that were used by the stakeholders and TCEQ. These meetings were held after the proposal to discuss information included in the preamble in order to assist these groups with developing comments on the proposed rule and to listen to their concerns. In addition to these meetings, staff also responded to a number of individual requests for information and explanation, including requests from members of the Bay and Basin Expert Science Team (BBEST) and the consultant for the BBASC after proposal in order to provide further assistance. The commission has also made the models used in its decisions available on its Web site.

The commission notes that SB 3 clearly provides that the commission perform its own review of the stakeholders' recommendations. As provided in TWC, §11.02362(o), the stakeholders develop recommendations not final

environmental flow standards, and send their recommendations to the commission. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." The commission has followed the statute in this regard and has provided explanation of its rationale. The rule was not changed in response to this comment.

NWF and Sierra Club-Lone Star commented that the rationale in the proposed rule for deleting larger pulses is insufficient. The commenters commented that the TCEQ staff's rationale for deleting pulses between the seasonal pulses and the overbank pulses is that there isn't a site-specific study to support pulse recommendations with durations of longer than 30 days. First, SB 3 does not contemplate waiting for site-specific studies. To the contrary, it provides that recommendations are to be based on the best available science now, while some unappropriated water is still available to be protected, and then are to be refined over time through the work plan process. Second, there is certainly no shortage of studies or literature acknowledging the need for a full regime of pulse flows. Guidance from the SAC, the science team report, the SB 2/Texas Instream Flow Program (TIFP) site-specific studies, and the National Research Council Review of the TIFP all discuss the importance of a full regime of pulse flows. Protections of larger pulses are not only critical for riverine considerations, such as channel geomorphology, water

quality considerations and invasive species control for example, but are also essential for maintaining bay and estuary health. Eliminating protection for these larger pulses, critically important freshwater inflows necessary to maintain a sound ecological environment could be captured. NWF and Sierra Club-Lone Star commented that this loss of protection is particularly damaging for the San Antonio Bay system during the fall and winter periods for which no quantified freshwater inflow protections are available to provide a backstop for inflow protections.

The commission acknowledges that overbank flows are a component of a flow regime for a sound ecological environment. However, the flows the commission is protecting in the adopted rule are not calculated to result in water flowing out of the banks of the river. The commission further responds that there was little site-specific information that would assist it in drafting the adopted standards although the commission acknowledges that there was some information available that was considered by the stakeholders. The commission also notes that the specific high flow pulse levels and frequencies in the science team and stakeholders' reports are mostly based on a statistical representation of historic streamflows and there was little scientific information tying these specific statistics to environmental water needs. The adopted standards incorporate subsistence flows, base flows, high flow pulses, and application of the

adopted rules to permits subject to this subchapter will result in flow variability after diversions under those permits occur. To the extent that additional information becomes available through monitoring and studies as part of adaptive management, the science team and stakeholders could consider that information in future deliberations and recommend different flow values for consideration during future rulemaking. The commission further responds that leaving some water available for new permits will not prevent these larger flood events from occurring because they will occur naturally. The rule was not changed in response to these comments. However, at the August 8, 2012 commission agenda, the commission added an additional level of pulse flows to measurement points in the Guadalupe River Basin and increased the base flow values for measurement points in the Guadalupe River Basin described in §298.380(c)(1) - (5) and (7).

NWF and Sierra Club-Lone Star commented that the rationale in the proposed rule for deleting overbank flows from the rules is insufficient. They commented that the stated basis for not including overbank flows is that they are generated by natural rain events and are expected to continue. The commenters stated that like all pulses and, indeed, all freshwater inflows, they also expect them to continue unless a project big enough to catch them is built. They said that is the whole point of including protection of those flows in the BBEST and BBASC recommendations and it is why those protections should

be included in environmental flow standards. NWF and Sierra Club-Lone Star commented that large on-channel reservoirs can produce large reductions in overbank flows and that overbank flows provide many critical ecological functions, such as providing life cycle cues for many species, seed dispersal, floodplain connectivity and nutrient deposition, and providing freshwater inflow and sediment delivery to bays and estuaries. They commented that all water comes from natural rain events.

The commission acknowledges that overbank flows are a component of a flow regime for a sound ecological environment. However, these flows have the potential to inundate low-lying areas. The flows the commission is protecting in the adopted rule are not calculated to result in water flowing out of the banks of the river. The commission notes that the 2011 Region F, Region K, or Region L Water Plans did not include any on-channel water supply projects in the basin and bay systems covered by the adopted rules that would impact overbank flows. The commission believes that the adopted rules are sufficiently protective of the environment because they include a flow regime with subsistence, base, and pulse flows and also include freshwater inflow standards. The numerical values for these flow regime components are based on the values in the stakeholder reports. Under SB 3's adaptive management provisions, further analyses and studies will be performed in the future to determine whether the adopted

standards, once implemented, continue to protect the environment. No change has been made in response to this comment.

CCA commented that the assumption is that WAM should be used to determine appropriate environmental flow standards but that this mixes apples and oranges. CCA stated that the WAMs are for modeling potential water availability under existing permits in a repeat of the drought of record, not for determining appropriate environmental flow standards. CCA commented that for modeling potential water availability, the WAMs assume: 1) a repeat of drought of record; 2) full utilization of all previous permitted rights; and 3) no return flows. CCA commented that such assumptions may be entirely appropriate with regard to modeling potential availability for new permitting but with respect to science-based appropriate environmental flow standards for different seasons in wet- years, average years, and drought years, assumptions (2) and (3) are completely counterfactual, and the drought of record is one but only one important data point. CCA commented that a model's projection that, in a repeat of the drought of record, and if every permittee used all water permitted to it and if none had any return flows, environmental flow standards would not be met in 18% of the years is not a reason why such standards should not be set under TWC, §11.1471(a)(1).

The commission responds that it followed the process created by the Texas

Legislature in TWC, §11.1471, to determine these flow standards. It considered all of the recommendations provided by the science team and the stakeholder groups and other relevant factors, including staff's water availability analysis, when drafting the adopted rules. In developing the adopted rule, the commission balanced human and other competing needs for water with the scientific recommendations. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors."

The commission did not use the WAM to develop specific values for flow regime components. These values were based on the stakeholders' recommendations, which were, in turn, based on the recommendations of their science teams. The WAM was used for the balancing analysis discussed previously. A scenario representing future human water needs was modeled with the stakeholders' recommended environmental flow standards. Specific values were adjusted until a reasonable balance was achieved. Because the adopted standards will apply to new appropriations of water issued after September 1, 2007, and availability determinations for new appropriations are modeled assuming a repeat of the drought of

record, full utilization of permitted rights, and no use of return flows, it is appropriate to use those assumptions while testing stakeholders' recommended flow standards to determine impacts on future water rights permitting. The commission notes that it has adopted many of the stakeholders' recommendations in both basin and bay systems. The rule was not changed in response to this comment.

CCA commented that TCEQ also proposes not to include stakeholder recommendations for pulse flows with return periods longer than one year (with the exception of the lower Colorado River below Lake Travis). CCA stated that TCEQ offers two bases for this decision. First, it states that there was "little" site-specific information supporting these specific higher pulse flow levels and frequencies. CCA commented that TCEQ's explanation makes clear that some such information is available, but it does not explain why it is not enough, or how much more is necessary to justify this otherwise arbitrary decision.

The commission responds that there was little site-specific information that would assist it in drafting the adopted standards, although the commission acknowledges that there was some information available that was considered by the science team. As noted in this preamble, the commission considered the information in the science team's report. However, there

was no site-specific information tying these pulse durations to environmental needs. The commission reviewed the hydrographic separation which formed the basis for the science team's recommendations. In some instances, these large pulses appear to be comprised of one or more pulses connected by intervening periods of high base flows. This creates uncertainty regarding the calculations of these pulses because the identified pulses likely represent more than one pulse flow event. In addition as stated in this preamble, these higher pulses impact remaining unappropriated water. Further analysis and studies may need to be performed in the future to determine appropriate magnitudes, volumes, and durations of these larger pulse events. HB 3/SB 3 contemplates that these types of studies can be considered through adaptive management via the work plan for this basin and bay system. To the extent that additional information becomes available through monitoring and studies undertaken under the work plan, the science team could consider this information in future deliberations. The rule was not changed in response to this comment.

CCA stated that TCEQ asserts that it "based its decisions on considerations of the recommendations from the stakeholders, sound science, and other public interests and relevant factors." CCA commented that such generalities are not reasoned justifications

as required by Texas law. CCA asks that TCEQ publish a new notice, of science-based environmental flow standards and set-asides, and with proposed reasoned justifications in terms of the facts as to each non-science factor on which the TCEQ proposes that environmental flow standards below the science-based level and set-asides below the appropriate flow standard level are the maximum reasonable. Only then can CCA and other interested persons comment meaningfully under SB 3 and the Texas Government Code.

The commission respectfully disagrees that this level of detail is required, or even reasonable for this rulemaking. The commission accepted most of the work that the science teams and stakeholders performed, but also balanced human and other competing needs for water, as required by statute. The state of the science for determining these specific environmental flow standards is by no means developed or settled because of data gaps and lack of specific information and studies in many areas within these basin and bay systems. This is the reason HB 3/SB 3 included an adaptive management process for revision and modification of the standards if and when more specific scientific data becomes available. The rule was not changed in response to this comment.

TPWD commented that under Texas Parks and Wildlife Code, §12.0011(c), a written

response to these TPWD recommendations and comments received by a state governmental agency may be required.

The commission acknowledges the comment.

TPWD commented that it and other interested parties provided preliminary written and oral comments sharing the view that the proposed rules lack clear language explaining the TCEQ analyses and reasoning for departures from the stakeholder recommendations. TPWD commented that in this rule proposal and future proposals, it would be helpful to document the data, information, and rationale used by the TCEQ staff. They further commented that all participants in this process would benefit from a clear understanding of how the TCEQ evaluates scientific data and analysis and the identification of the environmental or policy factors that influence the crafting of flow standards. TPWD commented that the proposed rules should include an equal level of documentation and explanation. For example, if a threshold amount of unappropriated flows is required to remain in each stream segment following application of the environmental flow standards, then the amount should be identified and the analytical methodology should be documented and explained.

The commission acknowledges the importance of transparency and has made efforts to be transparent in the process of developing the adopted

rules. In the Section by Section Discussion for §298.330 and §298.380 in the preamble, the commission identifies the science team reports, stakeholder committee reports, its water quality and water availability analyses, comments on the proposed standards and other information it relied upon in developing the adopted standards. Additionally, in the Section by Section Discussion for §298.330 and §298.380, the commission discusses the balancing analysis it performed and identifies the Web site where the models used for the balancing analysis are available for download. The commission notes that it considers each basin and bay system individually, so the factors considered in balancing can vary. The commission further notes that §§298.305, 298.310, 298.320 298.325, 298.330, 298.335, 298.355, 298.360, 298.375, and 298.380 were modified in response to other comments.

TPWD commented that as environmental flow standards will soon be translated into permit conditions, guidance on implementation of the standards is needed and would be helpful in evaluations of future flow standards rule proposals. TPWD stated that this type of guidance was requested by the TCEQ commissioners in April 2011. TPWD staff is available to assist TCEQ staff in developing a guidance document.

The commission responds that staff is working on implementation and this

document will be made available to the public when completed.

Five individuals commented that growth should be sustainable. One of these individuals commented that the proposed rule violates the concepts of sustainable development. One of these individuals commented that development should be restricted to protect the environment.

The commission acknowledges the comment and responds that the adopted rule applies to environmental flow standards for new applications to store, divert, or take state surface water. The commission believes that the adopted rules are sufficiently protective of the environment. Under SB 3's adaptive management provisions, further analyses and studies will be performed in the future to determine whether the adopted standards, once implemented, continue to protect the environment. No change was made in response to this comment.

Fifteen individuals commented on the impact of the proposed rules on bays and estuaries. Five of these individuals commented that the proposed rules would not provide enough water to support commercial fishing. Three individuals commented about the importance of bays and estuaries to the economy. Eight of these individuals commented on the importance of freshwater to the environmental health of bays and

estuaries.

The commission acknowledges that healthy bay systems are important for economic and ecological reasons. The commission included freshwater inflow standards in the adopted rule for the protection of bays and estuaries. The commission responds that under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." The commission followed the statute in adopting these rules. No change was made in response to this comment.

Five individuals commented that TCEQ's proposed rules are not based on science.

Three of these individuals commented that TCEQ did not provide a scientific basis for how the proposed rules are adequate to protect a sound ecological environment.

The commission responds that it did not disregard the science team recommendations, or the SAC's review of those recommendations. In addition, the commission performed its own water quality and water availability analyses for the adopted standards. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are

adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." The commission is required to balance needs for the environment with other needs including human water needs. The commission followed the statute in adopting this rule. The commission notes that it has adopted many of the stakeholders' recommendations in both basin and bay systems. The rule was not changed in response to this comment.

Six individuals commented on drought issues. One of these individuals commented that the drought in 2010 was more severe because of groundwater withdrawals. Two of these individuals commented that protecting rivers would provide enough water in droughts to keep the bays healthy. One of these individuals commented that TCEQ's proposal ignores drought and a percentage of rainwater should be left in the river to flush it.

The purpose of this rulemaking is to establish environmental flow standards that will only apply to new appropriations of water and amendments that grant new appropriations of water after September 1, 2007. The commission followed its instructions in TWC, §11.1471, to determine these flow standards. It considered all of the recommendations provided by the science team and the stakeholder groups and other relevant factors, including commission staff's water availability analyses, when

drafting the adopted rules. The commission notes that the adopted rules include subsistence flow levels that will limit diversions during extremely dry periods for permits to which this rule applies. No change has been made in response to this comment.

One individual commented that Texas is one of the worst states for clean public spaces and has poor results on the American State Litter Scorecard.

The commission responds that the purpose of this rulemaking is to establish environmental flow standards that will only apply to new appropriations of water and amendments that grant new appropriations of water after September 1, 2007. Littering was not considered in this rulemaking.

An individual commented that TCEQ should have learned from the experience of developing rules in the Trinity and San Jacinto Basins. The commenter acknowledges the problem of evaluating what flow level is necessary for ecosystem health. However, the commenter states that Texas has rightly committed to science-based environmental flows policy that draws upon scientific expertise and stakeholder recommendations to craft regulations that are protective of the environment and reflective of Texas' priorities. The commenter expressed concern that TCEQ's failure to adopt adequately

protective standards based on the process adopted by the state legislature in SB 3 would undermine the committees' work and that TCEQ should honor legislative intent and replace the proposed rules with rules that accurately reflect the committees' work.

The commission responds that it followed the process created by the Texas Legislature in TWC, §11.1471, to determine these flow standards. The commission is required to balance needs for the environment with other needs including human water needs. The commission did not disregard the stakeholders' recommendations. HB 3/SB 3 clearly provides that the commission perform its own review of the stakeholders' recommendations. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." The commission followed the statute in adopting this rulemaking. The commission notes that it has adopted many of the stakeholders' recommendations in both basin and bay systems. The rule was not changed in response to this comment.

Subchapter C: Sabine and Neches Rivers and Sabine Lake Bay

NWF and Sierra Club-Lone Star commented that they support a five-year revision cycle

for the environmental flow standards for Subchapter C (Sabine and Neches Rivers, and Sabine Lake Bay) of Chapter 298, although they believe the proposed deadline of September 1, 2013 for the submission of stakeholder recommendations is too aggressive to allow for development of information through the work plan activities needed to inform revision of the standards. These commenters recommended that the deadline for stakeholder recommendations be set for September 1, 2014, with the next set of recommendations being due September 1, 2018. After the 2018 deadline, any subsequent reviews would be due on a five-year cycle.

The commission respectfully disagrees with the comment. The stakeholders in this basin proposed that the review schedule for the environmental flow analyses and environmental flow regime recommendations, environmental flow standards, and strategies occur on a five-year cycle, integrated with the SB 1 (75th Legislature, 1997) Regional Water Planning five-year cycle and that the periodic review schedule for SB 3 environmental flow standards be aligned so that the review is available for consideration by the Regional Planning Groups in each round of Regional Water Planning. The adopted rule sets out a revision schedule on a five-year cycle that is aligned with the Regional Water Planning Cycle. The approved work plan for this basin proposes some studies that will be completed by September 1, 2013. These studies could provide additional

information at some locations, which the stakeholders could consider.

Therefore, the commission adopts the five-year cycles beginning in 2013, as requested by the stakeholders. The rule was not changed in response to this comment.

NWF and Sierra Club-Lone Star commented that the proposed rule would make the revision process contingent on receiving a recommendation from the stakeholder committee recommending that revisions to the environmental flow standards should be pursued. That is not consistent with TWC, §11.1471(f). That provision does not make revision of the flow standards contingent on receiving a stakeholder committee recommendation that revisions are needed. The legislation does contemplate that stakeholder participation must play an ongoing role in that process, but future reviews and revisions may not be made contingent on stakeholder committees, that may not even exist, making recommendations calling for those reviews or revisions. These commenters recommended that the proposed changes to §298.290 be revised to read as follows: "The adopted environmental flow standards or environmental flow set-asides for the Sabine and Neches Rivers, their associated tributaries, and Sabine Lake Bay may be revised by the commission through the rulemaking process. The Sabine and Neches basin and bay area stakeholder committee, or any other entity implementing the work plan, shall submit their review, if any, of the adopted environmental flow standards by September 1, 2014, with the next review, if there is one, to be submitted by September 1,

2018, and any subsequent reviews due every five years thereafter. If the commission determines that revisions to the adopted environmental flow standards are appropriate at the time that reviews are due, the rulemaking process shall be undertaken in conjunction with the periodic review. The final revised rules arising from a rulemaking undertaken in conjunction with any such periodic review shall be effective within one year after the deadline for the review of the adopted environmental flow standards. The rulemaking process shall include participation by a balanced representation of stakeholders having interests in the Sabine and Neches Rivers, their associated tributaries, and Sabine Lake Bay."

The commission agrees in part but responds that TWC, §11.1471, requires that the rulemaking process provide for the participation of stakeholders having interests in that particular bay and basin system. Therefore, the commission believes that the cycle for rulemaking should be consistent with the BBASC schedule. However, the commission does agree that the language in the rule regarding the effective date of final rule revisions, if any, could be clarified. The adopted rule was changed to reflect this revision. In addition, at the August 8, 2012 commission agenda, the commission added language clarifying that the commission could recommend revisions to the adopted standards, absent a stakeholder recommendation, in accordance with the periodic review, if the

commission determined that such revisions were appropriate.

Subchapter D: Colorado and Lavaca Rivers and Matagorda and Lavaca Bays

§298.305, Definitions

NWF and Sierra Club-Lone Star commented that the definition of "Dry condition" should specify that the approximately 20% of time being referenced is the drier period of time that does not include severely dry conditions rather than simply any 20% of time. The commenters requested that §298.305(4) be revised to include the phrases "and that is intended to represent periods when conditions are dry but not severe" and "and that is intended to represent periods when conditions are drier than average but not severe."

The commission agrees and §298.305(4) was modified to include this change.

TPWD commented that the definition of "Dry condition" states that dry is the hydrologic condition that would occur approximately 45% of the time in the Colorado River downstream of Lake Travis. A more appropriate frequency of occurrence would be 20% as is applied to all other points in the Colorado-Lavaca Basin and Bay Area.

The commission responds that the frequency of dry conditions on the Colorado River downstream of Lake Travis in the adopted rule is the

frequency recommended by the stakeholders. These locations have two levels of base flows, which are based on a site-specific study. The commission's opinion is that the stakeholders' recommended frequency is appropriate for these locations. No change was made in response to this comment.

NWF and Sierra Club-Lone Star commented that the definition of "Fall inflow quantity" in §298.305(6) should make clear that it is referring to the maximum amount during any three consecutive months in the defined period during a particular calendar year. These commenters request that §298.305(6) be revised to include the phrase "during any individual calendar year."

The commission agrees and §298.305(6) was modified to include this change.

NWF and Sierra Club-Lone Star commented that the definition of "Fall season quantity" should make clear that it is referring to the maximum amount during any three consecutive months in the defined period during a particular calendar year. These commenters request that §298.305(7) be revised to include the phrase "during any individual calendar year."

The commission agrees and §298.305(7) was modified to include this change.

NWF and Sierra Club-Lone Star commented that the definition of "Inflow regime level" in §298.305(10) should include a reference to the regimes defined in the figures located in §298.330(a)(2) and (c) and that the definition should track the terminology used. These commenters requested that §298.305(10) be revised to include the words and phrase "one of," "that includes a spring season quantity, a fall season quantity, and an intervening season quantity as described in the figure located in §298.330(a)(2)," "inflow," "inflow," and "as described in the figure located in §298.330(c)" and to delete the word "season."

The commission agrees and §298.305(10) was modified to include this change.

NWF and Sierra Club-Lone Star commented that the definition of "Severe condition" should specify that the approximately 5% of time being referenced is the driest period of time rather than simply any 5% of time. These commenters requested that §298.305(14) be revised to include the phrase, ". . . and that is intended to represent the driest periods."

The commission agrees and §298.305(14) was modified to include this change.

NWF and Sierra Club-Lone Star commented that the definition of "Spring inflow quantity" should make clear that the definition is referring to the maximum amount during any three consecutive months in the defined period during a particular calendar year. The commenters requested that §298.305(16) be revised to include the phrase, "during any individual calendar year."

The commission agrees and §298.305(16) was modified to include this change.

NWF and Sierra Club-Lone Star commented that the definition of "Spring season quantity" in §298.305(17) should make clear that the definition is referring to the maximum amount during any three consecutive months in the defined period during a particular calendar year. These commenters requested that §298.305(17) be revised to include the phrase "during any individual calendar year."

The commission agrees and §298.305(17) was modified to include this change.

NWF and Sierra Club-Lone Star commented that the definition of "Wet condition" should specify that the approximately 25% of time being referenced is the wettest period of time rather than simply any 25% of time. These commenters requested that §298.305(20) be revised to include the phrase "and that is intended to represent the wettest conditions."

The commission agrees and §298.305(20) was modified to include this change.

§298.310, Findings

NWF and Sierra Club-Lone Star commented that §298.310(b) does not accurately track the proposed rules because it does not acknowledge that the rules includes multiple levels of base flows and multiple levels of pulse flows. These commenters request that §298.310(b) be revised to include references to multiple levels of base and pulse flows and hydrologic conditions.

The commission responds that subsistence flows, base flows, and high flow pulses are components of a flow regime for a sound ecological environment and that this is reflected in the adopted rule. The rule was not changed in response to this comment.

NWF and Sierra Club-Lone Star commented that §298.310(c) does not currently acknowledge that the proposed inflow standards for Matagorda Bay and Lavaca Bay include freshwater inflow quantities that not only vary by season but also from year to year. NWF and Sierra Club-Lone Star further commented that this provision should acknowledge the importance of targets for implementation of strategies to increase inflows above levels expected with full exercise of existing water rights. The commenters requested that subsection (c) be changed to: "(c) For Matagorda and Lavaca Bays, the commission finds that the sound ecological environment of Matagorda and Lavaca Bays can best be maintained by a set of freshwater inflow standards that include freshwater inflow quantities that vary by season and from year to year and that incorporate targets for implementing strategies to increase inflow regime level achievement above the frequencies expected with full exercise of existing water rights."

The commission agrees in part and §298.310(c) has been modified to reflect this comment. The commission respectfully disagrees that this provision should reference full exercise of existing water rights. This finding references the conditions that exist today. HB 3/SB 3 is an adaptive management process. As such, the determination of whether a sound ecological environment exists at some future date, and how that sound ecological environment should be protected, is a topic that can be considered by future science team and stakeholder groups when

considering recommendations for revisions to the adopted rules.

NWF and Sierra Club-Lone Star commented that §298.310 fails to include any findings regarding East Matagorda Bay. NWF and Sierra Club-Lone Star commented that the stakeholders identified conditions in East Matagorda Bay as being of particular concern and recommended a narrative standard for protection of inflows to East Matagorda Bay. These commenters requested that a new subsection (d) be added to §298.310 to read as follows: "(d) Although not adopting quantified environmental flow standards specifically applicable to East Matagorda Bay. The commission does find that, in order to provide a sound ecological environment in East Matagorda Bay, reductions in inflows from new authorizations should be avoided and strategies to maintain and increase freshwater inflows should be pursued."

The commission agrees and in response to this comment a new §298.310(d) was included in the adopted rule. The new subsection provides that although the commission is not adopting environmental flow standards for East Matagorda Bay, it does find that reductions in inflows should be avoided and strategies to provide additional freshwater inflows should be pursued.

§298.320, Calculation of Hydrologic Conditions

NWF and Sierra Club-Lone Star commented that they appreciate the obvious attempt by TCEQ to reflect stakeholder committee recommendations in the development of the hydrologic condition provisions in §298.320. These commenters further stated that subsections (b) - (d) set out the initial hydrologic condition indicators to be used in governing permit operations for permits subject to these standards; however, the rule needs to be clarified to provide for ongoing, periodic revisions of the hydrologic condition indicators set out in subsections (b) - (d). These commenters requested that the commission add a new subsection (g) as follows: "(g) The hydrologic condition indicators set out in subsections (b) - (d) are intended for use to govern the operations of permits subject to this subchapter during the initial period, of not longer than ten years, until the environmental flow standards in this subchapter are amended. Those indicators were calculated to achieve compliance with the percentages of time stated in subsections (e) and (f). The hydrologic condition indicators set out in subsections (b) - (d) will be recalculated periodically, no less frequently than once every ten years, in order to achieve, to the greatest extent possible, compliance with the percentages of time stated in subsections (e) and (f) on an ongoing basis. Permits subject to these standards shall include special conditions providing for the periodic recalculation of the applicable hydrologic conditions in accordance with this provision."

The commission agrees in part and included a new §298.320(g) in the adopted rule and modified the Section by Section Discussion for §298.320.

The new subsection provides that the hydrologic condition indicators in the adopted rule are intended to apply during the initial ten-year period and will be recalculated at least once every ten years. The commission did not include a requirement in the adopted subsection related to permit conditions. New §298.320(g) requires that the hydrologic conditions be recalculated at least once every ten years. Adopted §298.325 specifies how diversions under subsistence and base flows will be governed by hydrologic conditions; therefore, this provision is not necessary.

§298.325, Schedule of Flow Quantities

NWF and Sierra Club-Lone Star commented that there is some ambiguity in the proposed language for §298.325(c) about what base flow criterion applies during severe hydrologic conditions because nothing in §298.325(b) addresses what happens during severe hydrologic conditions when flows are above the applicable base flow level. These commenters requested that §298.325(c) be revised to include the sentence, "For all measurement points, the dry base flow standard applies during severe hydrologic conditions."

The commission agrees and §298.325(c) was modified to include this change.

NWF and Sierra Club-Lone Star commented that in the preamble discussion TCEQ acknowledges that overbank flows and flushing flows for the bays and estuaries are considered to be components of a flow regime for a sound ecological environment. These commenters state that the omission of these flows is unjustified because a key purpose of the standards is to protect such events when they do occur in the future from being unduly altered by new impoundment or diversion facilities. These commenters further state that absent a showing that protecting such ecologically important flows, which are necessary to protect a sound ecological environment, is not achievable because that protection would result in an unreasonable adverse impact to other public interests, the flow standards must include such protection.

Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." In adopting these standards, it must consider the environmental flow analysis and the recommended environmental flow regime developed by the science team, and the recommendations developed by the stakeholders. However, the commission must also perform its own analysis. The commission acknowledges that overbank flows and flushing flows are a component of a flow regime for a sound ecological environment. However, the commission

is also aware that these flows have the potential to inundate low-lying areas. The flows the commission is protecting in the adopted rule are not calculated to result in water flowing out of the banks of the river. The rule was not changed in response to this comment.

§298.330, Environmental Flow Standards

ES requested that the commission remand the proposed standard back in support of the consensus recommendations presented by the stakeholder committee.

The commission followed its instructions in TWC, §11.1471, to determine these flow standards. It considered all of the recommendations provided by the science team and the stakeholder groups and other relevant factors, when drafting the adopted rules. The commission respectfully disagrees that it had to adopt the stakeholders' recommendations in their entirety because SB 3 clearly provides that the commission perform its own review of the stakeholders' recommendations. As provided in TWC, §11.02362(o), the stakeholders develop recommendations, not final environmental flow standards, and send their recommendations to the commission. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and

other relevant factors." The commission has adopted many of the stakeholders' recommendations. The commission believes that the adopted rules are sufficiently protective of the environment, because they include a flow regime consisting of subsistence flows, base flows, high flow pulses, and a freshwater inflow standard. Under SB 3's adaptive management provisions, further analysis and studies will be performed in the future to determine whether the adopted standards, once implemented, continue to protect the environment.

NWF, Sierra Club-Lone Star, TPWD, ES, and CCA commented that the commission should adopt the stakeholders' recommended pulse flows. NWF and Sierra Club-Lone Star commented that the commission has not justified the failure to include protection for pulse flows at least of the size and frequency unanimously recommended by the stakeholders. NWF and Sierra Club-Lone Star further commented that the stakeholders undertook a careful balancing exercise, which resulted in very large reductions in recommendations for pulse size below the levels identified by the science team as being adequate to protect a sound ecological environment. Those pulse sizes are all below flood stage levels. NWF and Sierra Club-Lone Star also commented that in §298.330, TCEQ did not propose protection for pulse flows with return periods in excess of one year, other than for the Colorado River below Lake Travis because of the absence of site-specific studies supporting those specific pulse flow levels and frequencies. NWF and

Sierra Club-Lone Star commented that SB 3 does not contemplate requiring new intensive site-specific studies and that a key concept of SB 3 is to make the best decisions possible based on currently available scientific information and then develop additional information and make appropriate adjustments in the future. On the one hand, TCEQ says it won't include protection for large pulses because then unappropriated water would be reduced and future projects that might seek to capture those pulses could not be permitted. On the other hand, TCEQ argues that there is no environmental harm associated with failing to include protection for such pulses because they will continue to occur. ES commented that it advocates for pulse flows, that using action state is too extreme, and that more water is taken from the environment to balance human needs. ES also commented that the stakeholders were charged with balancing the environment and human needs and that the stakeholders balanced ecological needs with protection of property in making their recommendation. ES commented that if all surface water permits were used, there would be very little water left for environmental flows and what little water is left is generally related to pulse flows. ES commented that pulse flows are important because the science has shown us that these flows are essential to ecological function. TPWD commented that no information is presented in the rules to support the reduction in high flow pulse values from the BBASC recommended flows to the action state flows and that the reduced flows will not provide the same level of ecological benefit derived from higher flows. TPWD further commented that the process National Weather Service uses to determine action stage is not clear, but it

appears to be based on non-ecological criteria and subjective information. CCA commented that the TCEQ would set the level of pulse triggers at the level where no harm has occurred, but the National Weather Service will notify the public to be prepared for potential flooding if the river continues to rise significantly beyond that level. CCA commented that TCEQ does not identify which or how many locations could flood, on which reaches of each of the rivers in question. CCA commented that TCEQ's departure from the stakeholder recommendation does not allow for bankfull events that do not in fact lead to floods, or for minor floods in certain reaches that benefit the riverine and estuarine environment while also avoiding any significant risk of harm to persons or property. TPWD recommended that the final rules use the high flow pulse values proposed by the BBASC as they will provide greater ecological benefit than the alternate values in the draft rules.

The commission respectfully disagrees with this comment. As it noted in the Section by Section Discussion of the proposed rulemaking, in many locations, flows at the flood stage could inundate low-lying areas and could therefore represent an event larger than the bankfull event. In addition, flows below the flood stage could also cause flooding. The commission reduced the trigger levels for some high flow pulses to the action stage level to ensure that the flows the commission is protecting in the adopted rule are not calculated to result in water flowing out of the banks of the river.

The statute contemplates that environmental flow standards be developed using available science. The statute also requires that the commission adopt the standards into rule. The commission does not have precise information regarding specific areas that will or will not be inundated during bankfull or other high flow events. It relied on available information from the National Weather Service.

The commission respectfully disagrees that it must identify which or how many locations could flood in the basins affected by the adopted rules. However, the commission does note that the stakeholder recommendations were adjusted to address flooding concerns at the following USGS Gages: 08126380 - Colorado River near Ballinger, 08153500 - Pedernales River near Johnson City, 08159200 - Colorado River at Bastrop, 08164000 - Lavaca River near Edna, 08164390 - Navidad River at Strane Park near Edna, 08164450 - Sandy Creek near Ganado, 08164504 - East Mustang Creek near Louise, 08164503 - West Mustang Creek near Ganado, 08164600 - Garcitas Creek near Inez, and 08162600 - Tres Palacios River near Midfield.

The commission also responds that with the exception of the lower Colorado River below Lake Travis, there was little site-specific or other

scientific information supporting the specific higher pulse flow levels and frequencies recommended by the stakeholders. These high flow pulse levels and frequencies are based solely on a statistical representation of historic streamflows. The commission notes that further analyses and studies may need to be performed in the future to determine appropriate magnitudes, volumes and durations of these larger pulse events. SB 3 contemplates that these types of studies can be considered through adaptive management via the work plan. To the extent that additional information becomes available through monitoring and studies undertaken under the work plan, the science team could consider that information in future deliberations and recommend different flow values for consideration during future rulemaking. The commission agrees that any unappropriated water that is available in this basin and bay system is available only during relatively wet conditions. Leaving some water available for new permits will not prevent these larger flood events from occurring. No change was made in response to this comment.

TPWD commented that the draft rules cite lack of site-specific information and hydrological modeling showing that much of the available unappropriated water includes these high flow pulses as reasons for eliminating them. However, no particular studies, analyses, or criteria are identified by the TCEQ to support its proposal, making

it difficult to understand the basis for the changes to the stakeholder recommendations. Sites downstream of the Highland Lakes retain the larger high flow pulse levels made in recommendations based upon existing instream flow studies. These studies indicate the ecological importance of high flow pulse events with a return interval of greater than one year. Extrapolation of the downstream study results to areas upstream of the Highland Lakes and/or to the Lavaca River Basin indicate that the full suite of high flow pulses as recommended by the BBASC are appropriate.

The commission responds that it has made the WAMs used in its analysis available in its Web site. The commission further responds that the science team report includes descriptive information on the 20 locations recommended by the stakeholders and included in the adopted rule. Many of these sites exhibit different characteristics than locations downstream from the Highland Lakes. HB 3/SB 3 is an adaptive management process. New studies and data can be developed via the work plan for this basin and bay system. To the extent that additional information becomes available through monitoring and studies as part of adaptive management, the science team and stakeholders could consider that information in future deliberations and recommend appropriate flow values for consideration during future rulemaking. The rule was not changed in response to this comment.

CCA commented that TCEQ concludes that "increasing pulse volumes and frequencies during wetter periods reduces the remaining unappropriated flow." CCA stated that TCEQ relies, apparently, on water availability modeling of unidentified "representative measurement points" by the ED. CCA further stated that TCEQ states in conclusory fashion that the ED "performed his own analysis to address the issue of balancing human and other competing needs for water in the basin," but the rule proposal contains no detailed description, no explanation, and no rational basis for that analysis or its conclusions. CCA commented that no interested person can comment meaningfully on a proposal that rests on such unidentified factual bases.

The balancing analysis performed by commission staff is detailed in the preamble to this adopted rule. The statute requires the commission to adopt rules that will apply to the evaluation of applications for new appropriations of water. When applying the adopted standards in determining availability for applications for new appropriations of water, staff will use its WAMs. Therefore, when performing its balancing analysis, staff used these same WAMs. The WAM used for staff's balancing analysis is available on the TCEQ's public Web site on the Environmental Flows Rulemaking Web page. The model and the discussion of the model application in the Section by Section Discussion for §298.330 provide the

rational basis for staff's conclusions.

LCRA, NWF and Sierra Club-Lone Star requested that the commission revise proposed §298.330(a)(2), concerning Threshold Volume Bay and Estuary Freshwater Inflow Standards for Matagorda Bay Inflows to include specific language protecting a minimum monthly inflow quantity of 15,000 acre-feet to Matagorda Bay as part of the environmental flow standards. LCRA commented that the proposed rule indicates that the monthly threshold volume is a strategy for freshwater inflow standards for Matagorda Bay and LCRA also commented that the stakeholders intended the monthly threshold volume to be applied to all future water right permits. NWF and Sierra Club-Lone Star comment that the stakeholders unanimously recommended that new permits and amendments to increase the amount of water stored, taken, or diverted from the Colorado River Basin be subject to certain limits based on not further worsening attainment frequencies for certain inflow regimes, including not being allowed to divert during months that inflows from the Colorado River to Matagorda Bay were less than 15,000 acre-feet. NWF and Sierra Club-Lone Star requested that §298.330(a) be revised by including the following change: "(3) result in diversions during a month that a monthly inflow quantity of at least 15,000 acre-feet to Matagorda Bay from the Colorado River is not achieved." In addition, LCRA requests a conforming change to the definition of "Monthly strategy threshold inflow" in §298.305(13).

The commission agrees and in response to these comments the commission added new §298.330(a)(3) to include the monthly threshold requirement in the adopted rule and made conforming changes to the definition of "Monthly threshold inflow" in §298.305(13), to the figure located in §298.330(a)(2) and (b) and to the Section by Section Discussion for §298.330. The commission notes that it will apply this requirement as part of the water availability determination for new appropriations of water.

NWF and Sierra Club-Lone Star commented that generally the language of proposed §298.330(b) and (d) closely matches the stakeholders' recommendations. NWF and Sierra Club-Lone Star commented that the rule language could be read as indicating that improvements in inflows as a result of the implementation of strategies would only be protected if those improvements actually fully meet the freshwater inflow standards rather than if they merely incrementally help to get closer to meeting those standards. These commenters requested that subsection (b) and (d) be revised to add the word "help" to clarify both of these subsections.

The commission agrees and §298.330(b) and (d) were modified to include this change.

NWF and Sierra Club-Lone Star commented that proposed §298.330(d) includes the

term "inflow regime level" which does not appear in the figure located in §298.330(c) and no inflow regime levels are actually listed in the figure. NWF and Sierra Club-Lone Star requested that subsection (d) be revised to add the words "describe" and "frequency" and to delete the words "listed" and "level."

The commission agrees and §298.330(d) was modified to include this change.

TPWD commented that while most of the water in the Colorado River Basin is already appropriated, sufficient water exists in the Lavaca River Basin to provide an environmental set-aside. TPWD supports the stakeholder recommendation regarding set-asides. Even if the TCEQ ultimately decides against a set-aside, the rule package should include a technical analysis of the availability of water for a set-aside and analysis of the impacts of a set-aside.

The commission responds that it determined that the remaining unappropriated water in the Lavaca Basin before application of the adopted standards was only available approximately 40% of the time, as described in the Section by Section Discussion for §298.330. TWC, §11.1471(a)(2), qualifies the requirement for a set-aside as "to the maximum extent reasonable when considering human water needs." In the Lavaca Basin,

the commission has determined that set-asides are not reasonable because of water availability. Special conditions placed in a permit are a more effective method to protect flows in the stream when new appropriations of water are granted while providing water for future human needs. This is because if special conditions are used there are other sources of water in a stream that could be used to meet environmental flow requirements in a permit; for example, water appropriated to downstream water right holders, water appropriated to another but not used, or return flows. Additionally, set-asides require a water availability determination, and these sources would not be used to determine water availability because they would not be considered to be unappropriated water. The commission is only determining in this rule making to not establish set asides at this time for the Lavaca Basin. After gaining further experience with implementation of environmental flows standards, as part of the adaptive management process, the commission is willing to revisit the issue. The rule was not changed in response to this comment.

§298.335, Water Right Permit Conditions

NWF and Sierra Club-Lone Star commented that although it may often work out that "flow restriction special conditions" would be adequate to ensure compliance with the environmental flow standards, there is no need to constrain the commission's discretion

in this manner. NWF and Sierra Club-Lone Star commented that it simply is not possible now to predict precisely what types of permit applications the commission may be asked to consider in the future and the commission should retain flexibility to protect the flow standards using other types of permit conditions. These commenters requested that the commission remove the phrase "flow restriction" from §298.335(a) - (c).

The commission responds that the adopted flow standards in Chapter 298 will be included in permits for new appropriations of water as special conditions. Special conditions that protect environmental flow standards would be those special conditions that ensure compliance with the standards. The commission will implement these standards in each permit granted for a new appropriation of water. Applications for new appropriations of water currently receive flow restrictions based on their location and facts provided in the application. Similarly, an application for a new appropriation of water under these rules will receive streamflow restrictions as provided by the adopted rules. The rule was not changed in response to this comment.

LCRA, NWF and Sierra Club-Lone Star commented that the proposed rules do not include the stakeholders' pulse flow implementations approach. LCRA commented that the stakeholders' recommended a tiered approach for the pulse flows in the lower

Colorado River that tied the flows to diversion rates and storage volume and include cumulative impact provisions. LCRA commented that the proposed rule simplified this approach greatly, and in doing so, resulted in a loss of detail that was critically important to the BBASC consensus. LCRA requested that the commission revise proposed §298.335(b) to incorporate the specific proposals included in the stakeholder report. NWF and Sierra Club-Lone Star commented that if the commission includes additional levels of pulse flow protections, they would support inclusion in the flow standards of the stakeholders' pulse flow implementation approaches, which include cumulative impact provisions.

The commission agrees in part with the comment. The commission notes that the proposed rule included a number of the stakeholders' applicability recommendations. In response to these comments, the commission included additional applicability requirements for the one per 18-month pulse flow and the one per two-year pulse flow for locations on the Colorado River below Lake Travis in the adopted rule because pulse flows at those recurrence intervals are included in the adopted standards. The commission adds new §298.335(c) and (d) to reflect these modifications. The commission respectfully disagrees that the stakeholders' recommended cumulative impact provisions are needed. These cumulative impact provisions would change the application of standards in future permitting

once the commission begins to issue permits for new appropriations of water that are subject to the adopted rule. The commission did not include these provisions in the adopted rule in order to avoid an overly complicated rule. In addition, there is no need for these provisions because HB 3/SB 3 is an adaptive management process. Under SB 3's adaptive management provisions, further analyses and studies will be performed in the future to determine whether the adopted standards, once implemented, continue to protect the environment. Under HB 3/SB 3's adaptive management provisions, the stakeholders will have opportunities to re-evaluate the issue of balancing human and other competing needs for water in this bay and basin system at a time in the future when the stakeholders can include an assessment of the cumulative impacts of any new permits. When this re-evaluation occurs, changed conditions can be addressed.

Subchapter E: Guadalupe, San Antonio, Mission, and Aransas Rivers, and Mission, Copano, Aransas, and San Antonio Bays General Comments

USFWS, Audubon, Bexar Audubon, GEAA, CARD, SMRF, HCA, ACCC, and eight individuals requested that the TCEQ adopt the recommendations of the stakeholder committee. One of these individuals commented that TCEQ should defer to a science based decision making process. CARD and an individual commented that the TCEQ must adopt rules that are no less protective than the stakeholder recommendations,

which already included many compromises to balance human water supply needs with the environment. An individual commented that TCEQ should incorporate rules that more closely resemble the stakeholders' balanced considerations. USFWS commented that a science team and stakeholder group worked for over two years to get recommendations that generally balance water needs for the environmental and humans. USFWS requested that TCEQ adopt the stakeholder recommendations or something better and not step further away from environmental needs for the bay.

The commission respectfully disagrees that it had to adopt the stakeholder recommendations in their entirety because SB 3 clearly provides that the commission perform its own review of the stakeholders' recommendations. As provided in TWC, §11.02362(o), the stakeholders develop recommendations, not final environmental flow standards, and send their recommendations to the commission. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." The commission further responds the adopted standards are not based solely on scientific information. The commission followed its instructions in TWC, §11.1471, by balancing human and other competing needs for water with scientific recommendations. The commission also

notes that it adopted many of the stakeholders' recommendations. No change has been made in response to this comment. However, at the August 8, 2012 commission agenda, the commission added an additional level of pulse flows to measurement points in the Guadalupe River Basin and increased the base flow values for measurement points in the Guadalupe River Basin described in §298.380(c)(1) - (5) and (7).

UGRA commented that they support the proposed rules. The Region J plan has identified the need to develop additional water supplies to meet future demands in the next 50 years.

The commission acknowledges the comment.

GRTU, HCA, and two individuals comment that TCEQ ignored the science when developing the rule. GRTU comments that the justification for deviation from the stakeholder recommendations is not well supported and that the analysis performed by TCEQ is poorly documented and inferior to the analysis done by the BBEST (with guidance from the SAC) and BBASC. HCA and an individual commented that the proposed rules ignored hydrological and ecological conclusions and analyses provided by the science team. HCA commented that TCEQ has not provided adequate scientific justification for how the proposed rules protect a sound ecological environment. The

decision to reject the best available science in this case risks sufficient flow in the Guadalupe River to meet all known needs. An individual commented that the stakeholder recommendations were guided by scientific principles and other than water quality there is not mention of any specific scientific principles that were used in developing the rule, TCEQ only addresses hydrologic considerations.

The commission did not disregard any science team recommendations, the SAC's review of those recommendations, or the stakeholder recommendations, but considered all of them. However, the commission respectfully disagrees that it had to adopt the stakeholder recommendations in their entirety because SB 3 clearly provides that the commission perform its own review of the stakeholders' recommendations. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." The commission further responds the adopted standards are not based solely on scientific information. The commission followed its instructions in TWC, §11.1471, by balancing human and other competing needs for water with the scientific recommendations. The commission provided information and explanations of the modeling, science, and balancing in the proposal

preamble and also made this information available upon requests from interested parties. The commission also responds that the information used by the ED in performing his balancing analysis is available on the commission Web site. The commission does note that it has adopted many of the stakeholders' recommendations. The rule was not changed in response to this comment.

Audubon Texas commented that healthy bay systems are critical and the bases to any future success in stabilizing colonial water bird populations and other wildlife along the Texas coast. Audubon states the proposed TCEQ rules would not provide sufficient protection of water resources in the bays and estuaries and would work to undermine all other management efforts. Audubon expressed concern that stakeholders invested their time on the assumption that recommendations for stream flow would be honored by TCEQ, that TCEQ has no scientific basis in support of their proposed rules, and that TCEQ has failed to show that these rules will be adequate to protect a sound ecological environment in the bays and estuaries.

The commission first responds that it did not disregard any science team or stakeholder recommendations, but considered all of them. However, the commission respectfully disagrees that it had to adopt the recommendations in their entirety because SB 3 clearly provides that the

commission perform its own review of the stakeholders' recommendations. As provided in TWC, §11.02362(o), the stakeholders develop recommendations, not final environmental flow standards, and send their recommendations to the commission. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." In addition to reviewing the science team and stakeholder reports, the commission also performed water quality and water availability analyses of the adopted standards. The commission believes the adopted rules are protective of the environment because they include a flow regime consisting of subsistence flow, base flow, high flow pulses, and a freshwater inflow standard. The commission further responds that it is very aware of the dedication of time and money and the concern for maintaining healthy rivers and bays exhibited by the stakeholder committee. Neither the commission nor its staff takes this significant contribution lightly. The commission adopted many of the stakeholders' recommendations. The rule was not changed in response to this comment.

Bexar Audubon, GEAA, GRTU, SMRF, CARD, and nine individuals commented that TCEQ disregarded the stakeholders' recommendations. Bexar Audubon commented

that TCEQ's ruling negates the Legislature's 2007 flow process by disregarding several years work by the stakeholders. Bexar Audubon also commented that TCEQ sent a clear message to the citizens of Texas that they will not be heard and that their work is meaningless and can be set aside. GEAA commented that TCEQ disregarded the consensus agreement reached by the stakeholders and will undermine the efforts of stakeholders and the legislature to balance human water needs while protecting rivers and bays and the coastal economy. GEAA also commented that TCEQ rules give stakeholders a feeling that their efforts have been wasted and provide no incentive for future stakeholder participation. GRTU commented that it is concerned that the BBEST and BBASC work is not being given appropriate consideration and instead a less protective set of flow standards, than those recommended by the stakeholder committee, are being proposed for rule adoption. GRTU commented that TCEQ ignored the work of the BBEST and the recommendations of the BBASC, and violated the spirit of if not its directives in SB 3. CARD and an individual commented that TCEQ's rationale for weakening or ignoring the stakeholder recommendations is insufficient and lacks transparency to the public. One of these individuals commented that TCEQ's proposed rule has major inconsistencies sides with the minority of the BBASC on the most important issue of environmental flows and that now that BBASC is working on the "work plan" it will become more discouraging unless the majority decisions are respected and followed by TCEQ. SMRF and two individuals commented that TCEQ should listen to this regional solution and learn from it and not just permit water rights,

"the way we've always done them," as TCEQ staff told the stakeholders at a recent meeting. SMRF and three individuals commented on the amount of time and money spent and the hard work of the stakeholders in developing their recommendations. One of these individuals commented that TCEQ's proposed rules in the Guadalupe River Basin are contrary to the process outlined by the Governor's Environmental Flows Advisory Committee, authorized in 2005.

The commission did not disregard any science team or stakeholder recommendations, but considered all of them. However, the commission respectfully disagrees that it had to adopt the recommendations in their entirety because SB 3 clearly provides that the commission perform its own review of the stakeholders' recommendations. As provided in TWC, §11.02362(o), the stakeholders develop recommendations, not final environmental flow standards, and send their recommendations to the commission. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." The commission notes that it has adopted many of the stakeholders' recommendations.

The commission also responds that, at a meeting with the stakeholders

prior to the proposed rule, staff noted that water availability for new permits is determined based on the commission's water availability models. The commission follows its instructions in the TWC and its rules in determining whether a permit for a new appropriation can be granted. The commission acknowledges the importance of transparency and has made efforts to be transparent in the process of developing the adopted rules. Staff provided detailed information and explanations of the modeling, science, and balancing, at two separate meetings with interested stakeholders, including the BBASC. These meetings were held after the proposal to discuss the information included in the preamble in order to assist these groups with developing comments on the proposed rule and to listen to their concerns. In addition to these meetings, staff also responded to a number of individual requests for information and explanation, including requests from members of the BBEST and the consultant for the BBASC committee after proposal in order to provide further assistance.

The commission further responds that, as staff stated numerous times at both of the technical meetings held with stakeholders and other interested parties, the commission is very aware of the dedication of time and money and the concern for maintaining healthy rivers and bays exhibited by the stakeholder committee. Neither the commission nor its staff takes this

significant contribution lightly. The rule was not changed in response to this comment.

Cow Creek GCD and an individual commented on drought impacts. Cow Creek GCD commented that Texas saw the worst single-year drought in 2011 and that a repeat Drought of Record can only have devastating consequences for all concerns as the margins of error when accounting for surface water, and more importantly groundwater, availability within the entire Guadalupe River Basin have already been stretched beyond reasonable or sustainable limits.

The commission acknowledges the comment and responds that the purpose of this rulemaking is to establish environmental flow standards that will only apply to new appropriations of water and amendments that grant new appropriations of water after September 1, 2007. The commission notes that the adopted rules include subsistence flow levels that will limit diversions during extremely dry periods for permits to which this rule applies. The rule was not changed in response to this comment.

GBRA commented that SB 3 established a specific process for the development of environmental flow standards, one that would ideally include a consensus recommendation from stakeholders and that such a consensus was not reached during

the Guadalupe-San Antonio (GSA) stakeholder process. GBRA commented that out of 25 stakeholders, only the GBRA, City of New Braunfels, and the City of Victoria depend on water for current and future water supply, and that these entities rejected the majority recommendations of the stakeholder committee because these majority recommendations significantly impair future development of surface water supply in the Guadalupe River basin without a demonstrated commensurate environmental benefit.

The commission followed its instructions in TWC, §11.1471, to determine these flow standards. It considered all of the recommendations provided by the science team and the stakeholder groups and other relevant factors, including commission staff's water availability analyses, when drafting the adopted rules. The rule was not changed in response to this comment.

GBRA commented that the rule should also clarify that site-specific studies may represent a more accurate and better means of determining the environmental flows that are needed to support a sound ecological environment at a specific point in a basin. GBRA commented that the rules should include language accepting the submittal of site-specific studies from applicants as an alternative to the proposed standards so that project specific issues can be considered during the permitting process for a given project.

The commission respectfully disagrees with this comment. TWC, §11.147(e-3) expressly states: "Notwithstanding Subsections (b) - (e), for the purpose of determining the environmental flow conditions necessary to maintain freshwater inflows to an affected bay and estuary system, existing instream uses and water quality of a stream or river, or fish and wildlife habitats, the commission shall apply any applicable environmental flow standard, including any environmental flow set aside, adopted under §11.1471 instead of considering the factors specified by those subsections." Subsections (b) - (e) are the statutes regulating how the commission protected the environment prior to HB 3/SB 3. It is clear that the bill and TWC, §11.147(e-3), meant for the commission to place any environmental flow standards determined under TWC, §11.1471, in a permit for new water instead of using these other statutes and site-specific data.

The commission agrees that site-specific studies may be an important part of the adaptive management of environmental flows. Site-specific studies can be used by the science teams, stakeholders, and the commission when considering whether environmental standards in the rules should be revised according to the schedule in the adopted rule. The rule was not changed in response to this comment.

GBRA and Victoria commented that implementation of HB 3/SB 3 will be an evolutionary process. While this may be true, the commenters would submit that due consideration should be given to creating documents that clearly articulate how the ED will implement the rules in its water right permitting program. These commenters request that the ED develop some form of implementation procedures, for public review and comment, so that the regulated community has an opportunity to understand and contribute to how the ED will implement these rules, in more detail, once they are adopted.

The commission responds that staff is working on implementation and this document will be made available to the public when completed.

GSA BBASC members, ACCC, and three individuals commented on the differences in the stakeholder recommendations and models and the TCEQ's proposed rule and models. GSA BBASC members and an individual commented that the proposed rules released by TCEQ on March 9, 2012, included some of the GSA BBASC recommendations but did not include others. GSA BBASC commented that the most significant changes were on the instream flow recommendations on the Guadalupe River and the freshwater inflow recommendations to the bays and estuaries. GSA BBASC expressed concerns with the rulemaking process and the degree of justification provided by the TCEQ staff for the proposed rules. The commenting GSA BBASC members want

to know if the TCEQ had access to other information and what analysis they may have conducted to develop the proposed rules because the results of TCEQ's analysis resulted in different conclusions than the analysis performed by the GSA BBASC. GSA BBASC also comments that TCEQ staff did not provide explanation of the analysis or scientific justification for the proposed flow recommendations. GSA BBASC commented that TCEQ's response to their questions and concerns gave the impression to many BBASC members that their substantial personal dedication and involvement in this process was dismissed. GSA BBASC commented that this perception discourages the valuable participation of individuals in future stakeholder driven processes. GSA BBASC commented that TCEQ did not use the same models used by the GSA BBASC or GSA BBEST making an apples-to-apples comparison between the proposed rules and the GSA BBASC recommendations problematic. GSA BBASC commented that a more thorough explanation of the proposed rules and the associated TCEQ staff analysis would be beneficial. Two of these individuals commented that the computer model the TCEQ used should be compared to the model runs the stakeholders did and discussed openly.

The commission acknowledges the importance of transparency and has made efforts to be transparent in the process of developing the adopted rules. The commission also responds that it has been clear from the beginning of this process that it would use its water availability models that

it uses in permitting to perform its balancing. The SAC, in its discussion paper *Moving from Instream Flow Matrix Development to Environmental Flow Standard Recommendations* also notes that water availability models modified through the Regional Planning process to reflect implementation of future projects may not include the same assumptions for existing water rights and prior appropriation as the models used by the commission in its water availability determination for new permits. The commission's understanding is that the stakeholders used a model that does not appropriately subtract from availability existing water rights valued at their full authorization and included return flows. Such an analysis would therefore overestimate the likelihood that a project could be permitted. Staff provided detailed information and explanations of the modeling, science, and balancing included in the preamble as well as a discussion of the differences in the models that were used by the stakeholders and TCEQ. This information was also presented at two separate meetings with interested stakeholders, including the BBASC. These meetings were held after the proposal to discuss information included in the preamble in order to assist these groups with developing comments on the proposed rule and to list their concerns. In addition to these meetings, staff also responded to a number of individual requests for information and explanation, including requests from members of the BBEST and the consultant for the BBASC

committee in order to provide further assistance.

The commission further responds that, as staff stated numerous times at both of the technical meetings held with stakeholders and other interested parties, the commission is very aware of the dedication of time and money and the concern for maintaining healthy rivers and bays exhibited by the stakeholder committee. Neither the commission nor its staff takes this significant contribution lightly. The rule was not changed in response to this comment.

GSA BBASC and ACCC commented that consistent with the open scientific review process outlined in SB 3, TCEQ should promote more understanding and dialogue throughout the rulemaking process. GSA BBASC comments that region by region discussion and agreement with TCEQ on the models, technical tools, assumptions, and data to be used should be reached prior to the work of the BBEST, BBASC and TCEQ staff. GSA BBASC requests that TCEQ coordinate a workshop with the BBEST and the BBASC during its technical analysis phase to ensure understanding and interpretation of analysis presented in reports by the BBEST and BBASC to make the process much more transparent for stakeholders so they can understand the similarities and differences that may result from the TCEQ analysis.

The commission has followed the process provided in SB3/HB3. TCEQ staff was available to the stakeholders and science team and made presentations to both groups during the development of their recommendations. As noted before in this preamble, TCEQ staff also made multiple presentations to interested groups and individuals after this rule was proposed to discuss information included in the preamble in order to assist these groups with developing comments on the proposed rule and to listen to their concerns. Staff continues to be available to these groups. The commission welcomes the suggestions for process improvement and will carefully consider them.

GRTU, CARD, NWF and Sierra Club-Lone Star, GEAA, and an individual commented that the proposed rules are not adequate to support a sound ecological environment. GRTU commented that commission fails to provide a basis for the assertion that the proposed standards would be protective of a sound ecological environment. The sole reference to any analysis connected to the question of sound ecological environment is the reference in the proposed rules to a water quality analysis that the commission purportedly conducted. CARD commented that the rules fall unreasonably short of providing the environmental protections that the rivers and bays need to remain healthy and economically productive. Adoption of this proposal will worsen existing challenges these waterways face by allowing additional water withdrawals at times when the rivers and wildlife that depend on them most need sufficient flows. GEAA commented that

TCEQ's proposed rules do not provide adequate protections of rivers and bays and are not adequate to support the ecosystem that relies on instream flows. TCEQ failed to protect bays and estuaries and the birds and wildlife that rely on these habitats.

The commission responds that under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." The commission adopted many of the stakeholders' recommendations. The commission further responds that the adopted standards are not based solely on scientific information. The commission followed its instructions in TWC, §11.1471, by balancing human and other competing needs for water with the scientific recommendations. The adopted rules are protective because they include a flow regime consisting of subsistence flow, base flow, high flow pulses, and a freshwater inflow standard. The numerical values for these flow regime components are based on the stakeholders' recommendations. The commission also responds that the ED's water quality analysis was discussed in the preamble and has been available upon request. The rule was not changed in response to this comment.

An individual commented that the rule proposal will serve to maintain sound ecological

environments within the river basins and associated estuary systems based on the results of quantitative environmental flow analyses. Results of these analyses indicate that flow variability, water quality, high flow pulse frequency, and freshwater inflows to San Antonio Bay will be maintained and aquatic habitat will be available in comparable and often greater quantities and frequencies after considering the project used in the balancing.

The commission acknowledges the comment.

GRTU commented that the proposed standards create significant risks to flow for the trout fishery and other recreational uses of the Guadalupe River downstream of Canyon Dam, as well as the ecology needed for fish and wildlife habitat. GRTU comments that TCEQ's justification and analysis of the proposed standard does not evaluate the impacts on the trout fishery or the economic value of that fishery and other recreational uses downstream of Canyon Dam.

Much of the flow for trout fishery downstream of Canyon Dam is provided by releases of permitted water from Canyon Dam. Existing water rights will not be affected by the adopted environmental flow standards. The pulses provided for in the adopted rules will also provide some protection for flow for the trout fishery and other downstream recreational uses. The

commission balanced those interests in recreational use with other public interests in setting the final environmental flow standards. Recreation and wildlife needs are included in the streamflows protected by the adopted rule. No change has been made in response to this comment.

An individual commented that TCEQ staff explained in sufficient detail both their methodological approach and the analytical tools upon which the draft rules are based and that it is inaccurate and unfair to TCEQ and its employees to imply that they carried out their duties in an other than exemplary manner. The commenter noted that the GSA BBASC considered, and modeled, the impact of the simplified structure employed by TCEQ in the Trinity and Sabine bay and basins, producing results similar to those contained in the proposed rules. This analysis was the basis for GBRA's recommendations. The commenter states that GBRA asked that the simplified structure be included as a minority report, or be otherwise appended thereto and that this request was rejected by the majority of the stakeholders.

The commission acknowledges the comment.

ACND commented that the minimum inflows to San Antonio Bay recommended by the BBASC are not sufficient to sustain the health and ecological productivity of San Antonio Bay and surrounding bays, and that the TCEQ proposed rules for the

Guadalupe River fall far short of even the BBASC recommendations for inflows to San Antonio Bay. ACND commented that in moving from the stakeholder recommendations to the proposed rule language, TCEQ staff did not include major aspects of the recommended protections, particularly for the Guadalupe River. ACND states that seasonally-significant flow protections required to sustain and improve the health of the bay and estuary systems were not included in the proposed rules. ACND requests that TCEQ honor the stakeholder recommendations in the BBASC report and improves on the weak BBASC recommendations regarding inflows to San Antonio Bay.

The commission responds that it followed its instructions in TWC, §11.1471, by balancing human and other competing needs for water with the scientific recommendations in developing the adopted rule. It considered all of the recommendations provided by the science team and the stakeholder groups and other relevant factors when drafting the adopted rules. Among the factors the commission considers are the impacts of the adopted standards on future permitting, and this determination is basin specific. Using the stakeholder recommendations would not leave a water availability window for future permitting. The commission believes that the adopted rules are sufficiently protective of the environment because they include a flow regime consisting of subsistence flows, base flows, high pulse flows, and a freshwater inflow standard. Under SB 3's adaptive management

provisions, further analyses and studies will be performed in the future to determine whether the adopted standards, once implemented, continue to protect the environment. No change has been made in response to this comment.

SARA commented that the continued health of the coastal economy is dependent upon the health of bay and estuarine ecosystems and it appears the TCEQ's draft standards only considered the human needs (water resource projects) of the more populous upper basin potentially to the detriment of the human needs of the coastal economy. SARA believes "human needs" has a broader definition than simply water resource projects because the economy of coastal communities is directly dependent on sustainable ecological conditions. SARA also comments that increased diversions of freshwater flows may have an impact on salinity and habitat and such impacts, if any, require more study to understand how they actually will affect marine life.

The commission acknowledges that healthy bay systems are important for economic and ecological reasons. The commission included freshwater inflow standards in the adopted rule for the protection of bays and estuaries. The commission also responds that TWC, §11.1471, requires the commission to consider "the human and other competing water needs in the basin and bay system." Humans obtain water for their needs by

obtaining appropriations of water or taking water for exempt purposes.

Human needs for recreation and wildlife enjoyment are included in the streamflows protected by the adopted rule. The commission notes that the stakeholders included an economic analysis in their report, and this report was considered by the commission in drafting the adopted rules. Under SB 3's adaptive management provisions, further analyses and studies will be performed in the future to determine whether the adopted standards, once implemented, continue to protect the environment. No change was made in response to this comment.

ICF commented that by reducing the BBEST and BBASC flow recommendations on the Guadalupe River, which has historically provided a majority of flows into the San Antonio Bay System, a basin-wide approach has not been maintained.

The commission respectfully disagrees with this comment and responds that it did not disregard any science team or stakeholder recommendations, but considered all of them. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." The commission adopted many of the stakeholders' recommendations. The

commission did not adopt all of the BBASC recommendations in an effort to achieve what it considers to be the appropriate balance between environmental interests and other public interests and relevant factors. An explanation of the commission's analysis regarding preserving some unappropriated flows for future human needs is set out in more detail elsewhere in this preamble.

ICF commented that eliminating the environmental set-asides recommended by BBASC subjugates the conciliatory efforts to create incentives and promote involvement of water users to remediate the water shortages.

The commission respectfully disagrees. The commission appreciates the work of the BBEST and BBASC to develop flow recommendations. However, under TWC, §11.1471(a)(2), the requirement for a set-aside is qualified by the clause "to the maximum extent reasonable when considering human water needs." In the Guadalupe/San Antonio basin, the commission has determined that set-asides are not reasonable because of limited water availability. Special conditions placed in a permit are a more effective method to protect flows in the stream when new appropriations of water are granted while providing water for future human needs. This is because if special conditions are used there are other sources of water in a

stream that could be used to meet environmental flow requirements in a permit; for example, water appropriated to downstream water right holders, water appropriated to another but not used, or return flows. The rule was not changed in response to this comment.

USFWS, ICF, and an individual commented regarding the federally endangered whooping crane. ICF and an individual commented that what other basins do not have to consider is the responsibility of recovery of the federally endangered Whooping Crane. Freshwater inflow management is important to blue crab abundance, and Whooping Crane mortalities. Correlations between freshwater inflows and blue crab abundance and between blue crab abundance and Whooping Crane mortalities have been established. Allowing more river flow to reach whooping crane critical habitat would reduce harm to the whooping crane population. USFWS commented that they are concerned about outcomes of environmental flows for the rivers and bays because they sustain the ecosystem for the federally endangered whooping crane and its designated critical habitat. USFWS also commented that the crane's survival factors, diet of blue crabs, fresh water to drink and proper habitat configuration may be impacted by river flow regimes.

In developing the adopted rule, the commission considered among other documents, the report of the GSA BBEST. In its extensive review of the

scientific literature, the BBEST considered the articles referenced by ICF as well as many other studies. Under the state environmental flow process, as set out in TWC, §11.1471, the commission must adopt environmental flow standards that are "adequate to support a sound ecological environment to the maximum extent reasonable considering other public interests and other relevant factors." The commission is adopting standards today with the appropriate balance between those interests. The commission notes that in its standards for the Guadalupe/San Antonio Bay system, it is adopting freshwater inflow standards designed to protect the bay. The commission declines to make any specific changes as a result of this comment. However, some changes made in this final rule may provide additional freshwater inflow to the bay over and above what was contained in the proposed rule.

An individual requested that the commission withdraw the proposal then re-propose once the agency has considered the question of how much water San Antonio Bay needs. The individual commented that the commission used the "lowest flow numbers in the BBASC report," the subsistence flow at the Victoria and Goliad gages, and assumed that this subsistence flow needed to sustain the river ecosystem was sufficient to sustain the estuary and San Antonio Bay. The individual further commented that the proposed rule implicitly assumes that water passing the Victoria and Goliad gages actually reaches the

bay. This assumption ignores the presence of the Guadalupe River diversion Dam and Salt Water Barrier, an inflatable dam capable of impounding 600 acre-feet of water and diverting it to water users in the lower basin below the gages.

The commission respectfully disagrees with this comment. The adopted rule includes subsistence flows, base flows, and high flow pulses. SB 3 provided a process to develop environmental flow standards for use in water rights permitting for new appropriations of water. The Guadalupe River diversion Dam and Salt Water Barrier are authorized under existing certificates of adjudication and these authorizations are not subject to the adopted standards. The science team for this basin and bay system developed a recommended environmental flow regime, or schedule of flow quantities adequate to support a sound ecological environment. The stakeholders for this basin took the science team's recommendations and considered those recommendations in conjunction with other factors, including the present and future needs for water for other uses. The commission then followed its instructions in TWC, §11.1471, to determine these flow standards. It considered all of the recommendations provided by the science team and the stakeholder groups and other relevant factors, including commission staff's water availability analyses, when drafting the adopted rules. Therefore, the adopted standards are not based solely on

scientific information. The commission followed its instructions in TWC, §11.1471, by balancing human and other competing needs for water with the scientific recommendations. Under SB 3's adaptive management provisions, further analyses and studies will be performed in the future to refine and validate the adopted standards. No change has been made in response to this comment.

An individual commented that the proposed TCEQ water allocation for the Guadalupe and San Antonio Rivers that flow into San Antonio Bay is inadequate and will result in a "take" of whooping cranes under the Endangered Species Act. In order to comply with the Endangered Species Act, the TCEQ needs to write a Habitat Conservation Plan that will protect the whooping crane flock and needs to obtain a "take" permit from the USFWS for management of the Guadalupe and San Antonio rivers.

The commission notes that the TCEQ's actions relative to the administration of water rights on the Guadalupe and San Antonio Rivers and its effect on the whooping cranes is the subject of a lawsuit pending at the present time in federal court. The TCEQ's position in that lawsuit is that no "take" has occurred and that it is not liable under the Endangered Species Act. The commission declines to comment further on that pending litigation.

NWF and Sierra Club-Lone Star commented that the Guadalupe-San Antonio BBEST report illustrates that with the full utilization of existing water rights, inflows to San Antonio Bay will not meet the inflow criteria recommended to maintain a sound ecological environment.

The commission responds that it included freshwater inflow standards in the adopted rule for the protection of bays and estuaries. The commission also notes that these rules are intended to apply to new appropriations of water. The commission's finding of a sound ecological environment is in keeping with the science team finding. The science team's finding and that of the commission reference the conditions that exist today. HB 3/SB 3 is an adaptive management process. As such, the determination of whether a sound ecological environment exists at some future date is a topic that can be considered by future science team and stakeholder groups when considering recommendations for revisions to the adopted rules. No change has been made in response to this comment.

One individual commented that the stretches below Victoria on the Guadalupe and especially below Goliad on the San Antonio are somewhat neglected in general because flows in those stretches are often extrapolated using upstream data. The commenter

stated that effects of the riparian areas on flows as well as the effect of flows on those areas deserve greater consideration.

The commission responds that HB 3/SB 3 added TWC, §11.02362(p), which recognized the importance of adaptive management and provided that after submitting its recommendations regarding environmental flow standards and strategies to meet the environmental flow standards to the commission, each stakeholder committee prepare and submit a work plan. The work plan is to establish a periodic review of the basin and bay environmental flow analyses and environmental flow regime recommendations, environmental flow standards, and strategies, prescribe specific monitoring, studies, and activities; and establish a schedule for continuing the validation or refinement of the basin and bay environmental flow analyses and environmental flow regime recommendations, the environmental flow standards adopted by the commission, and the strategies to achieve those standards. Issues related to flows in these reaches and the interaction with riparian areas can be considered by the stakeholders in their development of a work plan. The rule was not changed in response to this comment.

One individual commented that the work plan and adaptive management process

established by SB 3 that is presently being developed by the stakeholders allows the opportunity to monitor the effectiveness of the instream criteria in maintaining the ecological soundness of San Antonio Bay and allows continued consideration of the necessary components of the freshwater inflow regime and their associated frequencies of occurrence.

The commission acknowledges the comment.

ICF commented that the stakeholder recommendations were conservative, and that given more information, the amount and timing of environmental flows to maintain a sound ecological environment would be increased.

The commission acknowledges that further analyses and studies may need to be performed in the future to determine whether the adopted standards, once implemented, are protective. HB 3/SB 3 contemplate that this data and new studies can be considered through adaptive management via the work plan for this basin and bay system. To the extent that additional information becomes available through monitoring and studies undertaken under the work plan, the science team could consider that information in future deliberations. The rule was not changed in response to this comment.

An individual commented that it is not true that the bays and estuaries will be imperiled by the adoption of these rules. The environmental community should be satisfied and recognize that about 90% of the recommendations were adopted. The individual also commented that it's also irresponsible to place the entire burden for meeting future needs on groundwater. The risk of overbalancing for the environment is not to protect the environment, but rather it is when a crisis of an emergency arises to throw out the environmental protections that TCEQ's rules suitably modified.

The commission acknowledges the comment.

An individual requested that TCEQ also consider approving further study of the impact of Groundwater Management Area 9's proposed 30' Desired Future Condition or drawdown of the Trinity Aquifer. This decline will cause decreased spring flows in the Guadalupe River Basin and has not been calculated in the current modeling. The TCEQ should consider rules that address the groundwater surface water interface and the decreased spring flows that will result from drawing down the Trinity Aquifer an additional 30 feet. The groundwater study should be fully funded and included in the work plan for the Guadalupe River Environmental Flows Team.

The commission acknowledges the comment and responds that the adopted

rule applies to environmental flow standards for new applications to store, divert, or take state surface water. HB 3/SB 3 also added TWC, §11.02362(p), which recognized the importance of adaptive management and provided that after submitting its recommendations regarding environmental flow standards and strategies to meet the environmental flow standards to the commission, each stakeholder committee prepare and submit a work plan. The work plan is to establish a periodic review of the basin and bay environmental flow analyses and environmental flow regime recommendations, environmental flow standards, and strategies, prescribe specific monitoring, studies, and activities; and, establish a schedule for continuing the validation or refinement of the basin and bay environmental flow analyses and environmental flow regime recommendations, the environmental flow standards adopted by the commission, and the strategies to achieve those standards. Issues related to groundwater surface water interaction can be considered by the stakeholders in their development of a work plan. The rule was not changed in response to this comment.

§298.355, Definitions

NWF and Sierra Club-Lone Star commented that the definition of "Average condition" should reflect that the 50% of time being referred is intended to refer to times that are

neither dry nor wet. The commenters requested that §298.355(1) be revised to include the phrase, "and that is intended to represent periods that are neither wet nor dry."

The commission agrees and §298.355(1) has been changed in response to this comment.

NWF and Sierra Club-Lone Star commented that the definition of "Dry condition" should reflect that the 25% of time being referenced is intended to represent times that are dry, not just any 25% of time. The commenters requested that §298.355(2) be revised to include the phrase, "and that is intended to represent the driest periods."

The commission agrees and §298.355(2) has been changed in response to this comment.

NWF and Sierra Club-Lone Star commented that because the term "spring" is used to refer to a different time period for instream flow standards than for freshwater inflow standards, the applicability of the definition should be limited to the instream flow measurement points. The commenters requested that §298.355(6) be revised to include the phrase, "for the measurement points listed in §298.330(c)."

The commission agrees and §298.355(6) has been changed in response to

this comment.

NWF and Sierra Club-Lone Star commented that because the term "summer" is used to refer to a different time period for instream flow standards than for freshwater inflow standards, the applicability of the definition should be limited to the instream flow measurement points. The commenters requested that §298.355(9) be revised to include the phrase, "for the measurement points listed in §298.330(c)."

The commission agrees and §298.355(9) has been changed in response to this comment.

NWF and Sierra Club-Lone Star commented that the definition of "Wet condition" should reflect that the 25% of time being referenced is intended to represent times that are wet, not just any 25% of time. The commenters requested that §298.355(10) be revised to include the phrase, "and that is intended to represent the wettest periods."

The commission agrees and existing §298.355(10) has been changed in response to this comment.

NWF and Sierra Club-Lone Star request that the commission add a definition for "Time-period." The term "time-period" is used in describing certain short-duration high flow

pulses at four specific measurement points. Those time-periods do not conform to the seasons used in defining other pulses. Because occurrence frequency for those pulses is defined by time-period rather than a particular season, a defined term is needed to help describe how pulse flow compliance for those pulses will be determined. "Time-period-- for certain measurement points in the San Antonio River Basin. The period of time specifically listed in the column labeled "time-period" in Figures: 30 TAC §§298.380(c)(12)(B), (13)(B), (14)(B), and (15)(B). Each time-period listed in those figures is considered independently in assessing high flow pulse requirements even if there are overlapping months."

The commission agrees that a definition of time period would clarify the adopted rules. A new §298.355(10) was added in response to this comment. The commission also agrees that the adopted rule should specify application of these time periods. Adopted §298.375(d)(4) has been modified in response to this comment.

§298.360, Findings

SARA commented that TCEQ stated in the draft standards that, "the Guadalupe, San Antonio, Mission, and Aransas Rivers and their associated tributaries, Mission, Copano, Aransas, and San Antonio Bays, and the associated estuaries are substantially sound ecological environments." The GSA BBEST finding was based upon current levels of

return flows and water rights permit usage and they further qualified their finding of "soundness" by noting: By sound we mean that the measures of the status of native communities and habitats have been generally good and that no obvious long-term losses of function or undue impairment of important biologic, physical, or chemical processes are evident. Exceptions include communities and habitats directly affected by anthropogenic modifications in localized areas (i.e., within and immediately downstream of reservoirs or highly urbanized areas). It is important to note the GSA BBEST did not say that flows resulting from full permitted use of water will result in a sound ecological environment. Rough estimates depending on base flow levels suggest that approximately 40% - 45% of the permitted water in the basin is actually diverted / used today. As the region's population grows, that usage rate of currently permitted water is projected to increase. Regarding the bays and estuaries the GSA BBEST utilized "several lines of evidence" available to them in addition to professional judgment to determine "that a sound ecological environment has existed and currently exists in the Guadalupe and Mission - Aransas Estuaries." What science, if any, did the TCEQ rely on to determine that its recommended inflow standards would maintain a sound ecological environment within the bay and estuary under the full usage of existing water rights?

The commission responds that it did not find that its recommended inflow standards would maintain a sound ecological environment under full usage of existing water rights. The commission also responds that its finding of a

sound ecological environment is in keeping with the science team finding.

The science team's finding and that of the commission reference the conditions that exist today, under current water use conditions. HB 3/SB 3 is an adaptive management process. As such, the determination of whether a sound ecological environment exists at some future date is a topic that can be considered by future science team and stakeholder groups when considering recommendations for revisions to the adopted rules. No changes were made in response to this comment.

NWF and Sierra Club-Lone Star commented that year-to-year variation in flows as a result of changes in rainfall is not an adequate mechanism for protecting a flow regime and a sound ecological environment. The proposed rules do not incorporate multiple levels of base flows for locations in the Guadalupe Basin and, accordingly, do not provide for reasonable levels of year-to-year variations. A single base flow level, as is proposed for the Guadalupe River locations, is not sufficient to meet the statutory standard of protecting a sound ecological environment to the maximum extent reasonable considering other relevant interests. It does not account for fluctuations in flow levels based on year-to-year changes reflecting wet and dry conditions. SB 3 directs the development of an environmental flow regime, which "means a schedule of flow quantities that reflects seasonal and yearly fluctuations that typically would vary geographically, by specific location in a watershed, and that are shown to be adequate to

support a sound ecological environment and to maintain the productivity, extent, and persistence of key aquatic habitats in and along the affected water bodies." Thus, yearly fluctuations are intended to be incorporated in order to protect a sound ecological environment. The commenters requested that §298.360(b) be revised to include references to multiple levels of base flows, multiple levels of high flow pulses, overbank flows and hydrologic conditions.

The commission respectfully disagrees that multiple levels of base flows with hydrologic conditions are the only method that can achieve flow variability. The commission responds that although the adopted rules for the Guadalupe River Basin do include a single base flow standard, flow variability would be maintained by only allowing water right permits subject to the adopted rules to divert 50% of the flow between subsistence and wet base flow. In addition, the commission included flow standards for high flow pulses in the adopted rule and high flow pulses vary seasonally and annually. Therefore, the amount of water a water right subject to this subchapter could divert would vary depending on rainfall. Rainfall varies seasonally and annually. Therefore, once the standards are implemented in a water right permit, the remaining flows after diversion would vary by season and by year, depending on rainfall. The commission further responds that the adopted standards are protective of the environment

because they include a flow regime of subsistence flow, base flow, and high flow pulses. The numerical values for these flow components are based on the stakeholders' recommendations. Subsistence flows, base flows, and high flow pulses are components of a flow regime for a sound ecological environment and this is reflected in the adopted rule. Therefore, the requested revision to §298.360(b) is not necessary and the rule was not changed in response to this comment.

NWF and Sierra Club-Lone Star commented that the provision related to sound ecological environment in the bays and estuaries should acknowledge the importance of targets for implementation of strategies to increase inflows above levels expected with full exercise of existing water rights. The commenters recommend the following revisions to §298.360(c): "(c) For Mission, Copano, Aransas, and San Antonio Bays, the commission finds that the sound ecological environment of these bays can best be maintained by a set of freshwater inflow standards that include freshwater inflow quantities that vary by season and from year to year for certain selected seasons and that rely on quantities of flow protected by instream flow standards consisting of subsistence flows, three levels of base flows, and multiple levels of high flow pulse flows during the remaining seasons. The commission also finds that the freshwater inflow standards should incorporate targets for implementing strategies to increase inflow regime level achievement above the frequencies expected with full exercise of existing water rights."

The commission agrees, in part, and §298.360(c) has been modified to reflect this comment. However, with respect to adding a provision related to future conditions, the commission notes that its finding of a sound ecological environment is in keeping with the science team finding. The science team's finding and that of the commission reference the conditions that exist today. HB 3/SB 3 is an adaptive management process. As such, the determination of whether a sound ecological environment exists at some future date is a topic that can be considered by future science team and stakeholder groups when considering recommendations for revisions to the adopted rules.

§298.370, Calculation of Hydrologic Conditions

NWF and Sierra Club-Lone Star commented that they support, consistent with the recommendation of the GSA BBASC, creating a mechanism to have a preliminary assessment of hydrologic condition(s) throughout the river basin posted for the upcoming season (five) days in advance of the first day of the season to allow for operational planning and adjustments. The commenters also recommended that §298.370(a) - (c) be revised to include hydrologic conditions for measurement points in the Guadalupe River Basin.

The commission responds that based on balancing human and other competing needs for water it does not adopt multiple levels of base flow for measurement points on the Guadalupe River. Therefore, hydrologic conditions are not necessary for these measurement points. In addition, the commission respectfully disagrees that hydrologic conditions are the only method that can achieve flow variability. Flow variability will be maintained for measurement point in the Guadalupe River Basin because water right permits subject to the adopted rules can only divert 50% of the flow between subsistence and wet base flow. With respect to implementation of hydrologic conditions in permits that are subject to this rule, and to which hydrologic conditions are applicable, including posting these conditions prior to the start of the season, the commission sees implementation of HB 3/SB 3 as an evolutionary process. The commission wishes to maintain flexibility in permit special conditions as it gains experience implementing the environmental flow standards. No change has been made in response to this comment.

§298.375, Schedule of Flow Quantities

An individual commented that in the Guadalupe Basin, we're fortunate to have more science, and given present planning in this basin, that science has been shown to support the use of a simpler flow regime with a single level of subsistence, a single level

of base and a single level of pulse flows consistent with the simple regime proposed by the TCEQ staff, and the simpler regime supported by GBRA. The work of the stakeholders' technical consultants demonstrates that a simplified framework for instream criteria is protective of the San Antonio Bay system, as the simplified framework yields almost exactly the freshwater inflow regime as the full stakeholder recommendations.

The commission acknowledges the comment.

GBRA commented that they support the ED's proposed framework for instream flow standards for the Guadalupe River Basin, specifying a flow regime framework comprised of individual levels of seasonal subsistence, base, and pulse criteria, as it has been demonstrated during the stakeholder process that such flows maintain a sound ecological environment while having a less significant impact on future development of water supply.

The commission acknowledges the comment. At the August 8, 2012 commission agenda, the commission added an additional level of pulse flows to measurement points in the Guadalupe River Basin and increased the base flow values for measurement points in the Guadalupe River Basin described in §298.380(c)(1) - (5) and (7).

UGRA commented that a simplified instream flow regime of one tier of subsistence flows, one tier of base flows, and one tier of pulse flows is sufficient to provide and protect a sound ecological environment in the Guadalupe River Basin.

The commission agrees that the instream flow regime in the adopted rule is protective because it includes a flow regime consisting of subsistence flows, base flows, high flow pulses, and a freshwater inflow standard. At the August 8, 2012 commission agenda, the commission added an additional level of pulse flows to measurement points in the Guadalupe River Basin and increased the base flow values for measurement points in the Guadalupe River basin described in §298.380(c)(1) - (5) and (7).

ICF and two individuals expressed concerns that the proposed rule does not include overbank flows. ICF commented that by not including any overbank flows in the rules, TCEQ inhibits efforts to maintain hydrologic balance and support and removes all environmental considerations. One of these individuals commented that leaving out overbank or flushing flows is also disturbing even though TCEQ considers them to be a component of a flow regime for a sound ecological environment. The commenter stated that high flow pulses are important for delivering sediments and nutrients to the bays. These components are shown to be needed for a sound ecological environment by the

National Academy of Sciences and the San Antonio River SB 2 studies. One of these individuals commented that TCEQ relied on a broad concept that overbank flows result from large rainfall events and a more proactive approach is needed. Sediment transfers are better affected by surges and large influxes of freshwater, have benefits, and deserve specific protections.

The commission acknowledges that overbank flows and flushing flows are a component of a flow regime for a sound ecological environment. However, these flows have the potential to inundate low-lying areas. The flows the commission is protecting in the adopted rule are not calculated to result in water flowing out of the banks of the river. As noted elsewhere in this preamble, overbank flows are the result of naturally occurring large rainfall events which will likely continue to occur. The rule was not changed in response to this comment.

CARD and three individuals commented that high flow pulses are needed for the environment. CARD and one individual commented that the stakeholders met for over two years and submitted significant scientific evidence that rivers and bays require high flow pulses to be sustainable. Two individuals commented that the diverse stakeholders of this region agreed on protecting a certain amount of high flows that come during very wet periods, and these recommendations were left out of TCEQ's proposed rules. Rivers

and bays need some high flow pulses, and TCEQ is ignoring this need, as well as the very basic need to protect bays from being cut off from all river flows during dry times.

The commission acknowledges that high flow pulses are a component of a flow regime for a sound ecological environment. The commission also acknowledges that healthy bays are important. The adopted rules include both high flow pulses and a freshwater inflow standard. The commission believes that the adopted rules are protective because they include these flow components as well as subsistence flows and base flows. The rule was not changed in response to this comment.

Victoria commented that it also supports TCEQ's use of a single level of seasonal base flow. Studies done for the GSA BBASC show that additional levels of base flow are not needed. TCEQ has proposed that the wet base flows from the Hydrology-Based Environmental Flow Regime (HEFR) analysis be used for the spring and summer season base flows. Victoria believes that the environmental flow analyses performed for the stakeholder committee show that the dry base flows from the HEFR analysis for spring and summer are equally, if not more protective and would allow a little more water for water supply.

The commission responds that based on information in the science team

report and additional scientific information developed by the stakeholders, it appears that a flow regime consisting of only a dry base flow and a subsistence flow would be less protective. The commission acknowledges that more water could be diverted if the environmental flow standards are lower. However, the commission's balancing analysis demonstrates that the standards in the adopted rule also allow for some water to be available for future permits. The rule was not changed in response to this comment.

Three individuals commented on using one level of base flows for measurement points on the Guadalupe River. One of these individuals commented that the environmental flows recommended by the BBASC consider seasonal variations as well as dry, average, and wet hydrologic cycles, the TCEQ proposed rule is inconsistent in this regard. This approach does not provide protections in line with what naturally occurs and the rule makes more water available for diversion by new water rights applicants at the expense of the environment. One of these individuals commented that the instream flow study on the San Antonio helped the stakeholders realize the advisability of three tiers of base flow. This is more complex than TCEQ's rules and should be included in future permits. One of these individuals commented that three tiers of base flows are needed to recognize conditions of dry, average, and wet. The most significant and damaging changes in TCEQ's rules were made on instream flow recommendations on the Guadalupe River.

The commission considered all of the recommendations provided by the science team and the stakeholder groups and other relevant factors, including the commission's water availability analyses, when drafting the adopted rules. The adopted standards are not based solely on scientific information. The commission followed its instructions in TWC, §11.1471, by balancing human and other competing needs for water with scientific recommendations. The commission further responds that the adopted rules are protective of the environment because they include a flow regime consisting of subsistence flows, base flows, high flow pulses, and a freshwater inflow standard. Adopted §298.375(b) prohibits a permit that is subject to the adopted rules from diverting more than 50% of the difference between the applicable subsistence flow and the applicable base flow requirement. This provision will maintain variability in streamflows. No change has been made in response to this comment.

SARA commented that the best available science derived from the GSA BBEST, Dr. Hardy's continuing work in support of the GSA BBASC deliberations, and the SB 2 study on the San Antonio River all suggested multiple tiers of base flows are necessary to maintain the soundness of the ecological environment. What science or research relied upon by TCEQ suggested a single tier of base flow would maintain the presently found

sound ecological environment? SARA recommended that until an SB 2 study is completed on the Guadalupe River, and the results of such study suggest otherwise, the TCEQ should adopt the GSA BBASC recommendations as presented and then if more scientific information becomes available that supports that a single-tiered base flow is not harmful to maintaining a diverse riverine ecosystem, then the flow recommendations can be modified.

The commission responds that although the adopted rules do include a single base flow standard, flow variability would be maintained by only allowing water right permits subject to the adopted rules to divert 50% of the flow between subsistence and wet base flow. Therefore, once the standards are implemented in a water right permit, the remaining flows after diversion would be variable. Using multiple levels of base flow and hydrologic conditions to maintain flow variability would likely have the effect of allowing a water right holder subject to the standards to divert all of the remaining water in the river down to the standard. This would likely result in less flow variability. The commission also responds that the adopted standards are not based solely on scientific information. The commission followed its instructions in TWC, §11.1471, by balancing human and other competing needs for water with the scientific recommendations. Staff provided information and explanations of the modeling, science, and

balancing in the proposal preamble and also made this information available upon requests from interested parties. The commission also responds that the information used by the ED in performing his balancing analysis is available on the commission Web site.

The commission has adopted many of the stakeholders' recommendations. The commission believes that the adopted rules are sufficiently protective of the environment because they include a flow regime consisting of subsistence flows, base flows, high flow pulses, and a freshwater inflow standard. Under SB 3's adaptive management provisions, further analyses and studies will be performed in the future to determine whether the adopted standards, once implemented, continue to protect the environment. No change has been made in response to this comment.

HCA and GEAA commented that science shows that in order to maintain a sound ecological environment, rivers require multiple tiers of baseflows, high flow pulses, and overbank flows. Both the BBEST and BBASC recommendations called for protection of these flows. However, TCEQ proposed rules have eliminated the multi-tiered baseflows, several of the high flow pulses, and all overbank flows. TCEQ has not provided adequate justification for how their proposed rules will protect a sound ecological environment.

The commission agrees that flow variability is important. The adopted rules for both basin and bay systems include provisions that ensure flow variability. The commission also acknowledges that overbank flows are a component of a flow regime for a sound ecological environment. However, these flows have the potential to inundate low-lying areas. The flows the commission is protecting in the adopted rule are not calculated to result in water flowing out of the banks of the river. As noted elsewhere in this preamble, overbank flows are the result of naturally occurring large rainfall events which will likely continue to occur. The commission also responds that it did not disregard the science team recommendations, the SAC's review of those recommendations, or the stakeholder recommendations, but considered all of them. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." The rule was not changed in response to this comment. However, at the August 8, 2012 commission agenda, the commission added an additional level of pulse flows to measurement points in the Guadalupe River Basin and increased the base flow values for measurement points in the Guadalupe River Basin described in §298.380(c)(1) - (5) and (7).

NWF and Sierra Club-Lone Star commented that the rationale in the proposed rule for reducing protections from three levels of base flows to one level of base flow in the Guadalupe River Basin is insufficient. The BBEST report notes, a single base-flow regime could result in the complete loss of a specific component of the aquatic community because there is no longer the necessary variability.

The commission responds that although the adopted rules do include a single base flow standard, flow variability would be maintained by only allowing water right permits subject to the rules to divert 50% of the flow between subsistence and wet base flow. Therefore, once the standards are implemented in a water right permit, the remaining flows after diversion would be variable. Using multiple levels of base flow and hydrologic conditions to maintain flow variability would likely have the effect of allowing a water right holder subject to the standards to divert all of the remaining water in the river down to the standard. This would likely result in less flow variability. The rule was not changed in response to this comment.

NWF and Sierra Club-Lone Star commented that the proposed rule removes critical bay and estuary protection for the fall and winter seasons by not including three tiers of base flows on the Guadalupe River and by not protecting high flow pulses and overbank

pulses for the whole basin. There is inadequate justification in the rule for dropping these critical pieces from the flow regimes recommended by stakeholders.

The commission acknowledges that overbank flows are a component of a flow regime for a sound ecological environment. However, these flows have the potential to inundate low-lying areas. The flows the commission is protecting in the adopted rule are not calculated to result in water flowing out of the banks of the river. As noted elsewhere in this preamble, overbank flows are the result of naturally occurring large rainfall events which will likely continue to occur. The commission agrees that healthy bay systems are important. The commission included freshwater inflow standards in the adopted rule for the protection of bays and estuaries. In response to other comments, the commission modified §298.380(a) to clarify application of the freshwater inflow standards for use in water availability determinations for new water rights or amendments subject to this subchapter. The commission followed its instructions in TWC, §11.1471, to determine these flow standards. It considered all of the recommendations provided by the basin science team and the basin stakeholder group and other relevant factors, including commission staff's water availability analyses, comments on the proposed rule and basin specific information when drafting the adopted rules. The rule was not

changed in response to this comment. However, at the August 8, 2012 commission agenda, the commission added an additional level of pulse flows to measurement points in the Guadalupe River Basin and increased the base flow values for measurement points in the Guadalupe River Basin described in §298.380(c)(1) - (5) and (7).

GBRA commented that they can support the adoption of the 50% Rule in the Guadalupe River Basin as specified in §298.375(b). Analyses for the GSA BBASC and by TCEQ and GBRA have demonstrated that the 50% Rule helps to ensure base flow variability while limiting unnecessary impacts on water supply and operational complexity associated with three tiers of base flow.

The commission agrees and acknowledges the comment.

Victoria commented that it supports the subsistence flow implementation rule found in proposed §298.375(b) and the high flow pulses implementation rule found in proposed §298.385(b). It is Victoria's understanding that these implementation methods were adopted unchanged from the GSA BBASC report.

The commission acknowledges the comment but notes that although the 50% rule in the adopted Subchapter E does provide a limitation on

diversions between the adopted base and subsistence flow standards, the stakeholders recommendation applied the 50% rule only to diversions between subsistence flow and dry base flow. The rule was not changed in response to this comment.

GBRA commented that they support the adoption of the Pulse Exemption Rule as specified in §298.385(b). Analyses for the GSA BBASC and by TCEQ and GBRA have demonstrated the flow regimes resulting from example run-of-river diversion project development with implementation of standards including the Pulse Exemption Rule eliminate unnecessary impact on water supply while maintaining high flow pulse magnitudes and frequencies adequate to support the geomorphological characteristics of the streams and sound ecological environments.

The commission agrees and acknowledges the comment.

SARA commented that with the 20% pulse rate diversion in the rules, the overbank flows will not impede most water projects from development, but would provide critical protection if an on-channel reservoir were ever to be proposed for permitting. Given the significant investment of time and financial resources by SARA and the state agencies participating in the SB 2 Instream Flow study, what scientific and analytical information does TCEQ have that justifies the removal of the overbank flow requirement from the

San Antonio River environment flow recommendations? Additionally, another benefit that will occur from maintaining the overbank flows in the environmental flow standards, subject to the GSA BBASC's 20% diversion rate rule, is protection of inflows to the bay and estuary in those months where the instream flow standards are the bay and estuary requirement in the absence of specific frequency attainment targets.

The commission acknowledges that overbank flows are a component of a flow regime for a sound ecological environment. However, these flows have the potential to inundate low-lying areas. The flows the commission is protecting in the adopted rule are not calculated to result in water flowing out of the banks of the river. As noted elsewhere in this preamble, overbank flows are the result of naturally occurring large rainfall events which will likely continue to occur. The commission notes that the 2011 Region L Water Plan did not include any on-channel water supply projects in the basin and bay systems covered by the adopted rules that would impact overbank flows. Under SB 3's adaptive management provisions, further analyses and studies will be performed in the future to determine whether the adopted standards, once implemented, continue to protect the environment. No change has been made in response to this comment.

NWF and Sierra Club-Lone Star commented that the stakeholders intended the 50%

rule to apply between the single level of base flow and the subsistence level without regard to hydrologic condition for the three measurement points on the lower Guadalupe River only as part of a total package that provided offsetting protections. The effect of applying the 50% rule in this way is to allow additional diversions during those two seasons than could otherwise occur with three levels of base flows. Accordingly, subject to the qualification above about use of the 50% rule for single-season base flows, the commenters recommend that §298.375(b) and (c) be revised to reflect hydrologic conditions for two seasons for three measurement points on the Guadalupe River and for all seasons for the remaining measurement points in the Guadalupe River Basin.

The commission respectfully disagrees that it had to adopt the stakeholders' recommendations in their entirety because SB 3 clearly provides that the commission perform its own review of the stakeholders' recommendations. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." The commission notes that application of the 50% rule, as set out in the adopted standards would maintain flow variability without the need for hydrologic conditions and leave some water available for future permitting. Hydrologic conditions are

not included in the adopted rule for measurement points on the Guadalupe River. Therefore this revision is not necessary. No change has been made in response to this comment.

NWF and Sierra Club-Lone Star commented that the exclusion of pulse flows with durations of greater than 30 days has not been justified. For smaller pulses, up through the one-per-year pulse, these commenters recommended limiting the duration to 30 days as a step towards simplification. However, those pulses do need to be protected. In addition, larger pulse flows are needed to support a sound ecological environment and should be protected, even with a duration of longer than 30 days. In addition to playing key functions in riverine ecosystems, protection of large pulse flows is essential for protecting freshwater inflows to estuaries, especially during the two seasons for which no specific freshwater inflow standards are proposed. The levels of protection recommended by the stakeholders should be incorporated, including application of multiple levels of pulse flows for the Guadalupe Basin and protection of the full suite of pulse flows recommended by the GSA BBASC. For purposes of high flow pulse engagement, the reference to flows being above the applicable base flow standard is inapposite. Pulse flow requirements are not dependent on hydrological condition and are applicable whenever the trigger level flow has been satisfied. By definition, those trigger levels are higher than the base flow levels. Additional description is needed about when pulse flow diversion restrictions apply and end. That is particularly

important for the short-duration (two day) pulses at certain locations in the San Antonio River Basin because satisfaction of pulse flow requirements is measured in a more rigorous manner. The commenters requested that §298.375(d) be revised to include additional levels of high flow pulses in all river basins, to add the following phrase to §298.375(d)(4), ". . .and each time-period is independent of each other time-period with respect to high flow pulse frequency regardless of overlapping months, except as otherwise provided in subsection (7) of this section." to reference hydrologic conditions for all measurement points, and to include applicability requirements for additional pulse levels and for large pulses at measurement points specified in §298.380(c)(12) - (15).

The commission agrees that the adopted rule should specify application of the time period for large pulses described in §298.380(c)(12) - (15). In response to this and other comments adopted §298.375(d)(4) has been modified to reflect that time periods are independent of other time periods with respect to pulse flow frequency. The commission also agrees that pulse flows are independent of hydrologic conditions and §298.375(d)(1) was modified in response to this comment.

The commission respectfully disagrees that references to hydrologic conditions for all measurement points are needed because the adopted rule

does not include hydrologic conditions for the Guadalupe River basin. The commission respectfully disagrees that additional applicability requirements are needed for large seasonal pulses at measurement points described in §298.380(c)(12) - (15) because the rule adequately describes application of the small and large pulse flow requirements in adopted §298.380(c)(12) - (15).

The commission also respectfully disagrees that additional applicability requirements are needed for once per year or larger pulse flows because the adopted rule does not include these high flow pulses. The commission reviewed information from the science team, including the hydrographic separation which formed the basis for the science team's recommendations. In many instances, these large pulses appear to be comprised of one or more pulses connected by intervening periods of high base flows. This creates uncertainty regarding the calculation of these pulses because the identified pulses likely represent more than one pulse flow event. Further analyses and studies may need to be performed in the future to determine appropriate magnitudes, volumes, and durations of these larger pulse events. HB 3/SB 3 contemplate that these types of studies can be considered through adaptive management via the work plan for this basin and bay system. To the extent that additional information becomes

available through monitoring and studies undertaken under the work plan, the science team could consider that information in future deliberations. The rule was not changed in response to this comment. However, at the August 8, 2012 commission agenda, the commission added an additional level of pulse flows to measurement points in the Guadalupe River Basin and increased the base flow values for measurement points in the Guadalupe River Basin described in §298.380(c)(1) - (5) and (7).

§298.380, Environmental Flow Standards

Balancing analysis

One individual commented that the balancing occurred towards additional flows for the environment. Whether you apply the east Texas structure, whether you apply TCEQ's rules or the data that was elucidated by the BBEST, the impacts in environmental flows are the same. And what is not -- what is different, however, is the impact on human needs. The population of Texas continues to grow. Limits on population aren't on the horizon. The commenter stated that the three entities that depend upon surface water for future supply voted against the recommendations of the BBASC because they are charged with the responsibility of providing for human needs. It is simply irresponsible to consign surface water entirely to the environment without taking account for human needs.

The commission followed its instructions in the statute when drafting the adopted rules. Under TWC § 11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." The commission has adopted many of the stakeholders' recommendations. The commission followed its instructions in TWC, §11.1471, by balancing human and other competing needs for water with scientific recommendations. The rule was not changed in response to this comment.

CCCC commented that the stakeholder's recommendations failed to meet SB3's balancing requirements and would jeopardize the economy of the region. CCCC further commented that TCEQ's proposed rules properly balance water supply needs with environmental needs and requests that TCEQ adopt the proposed rules.

The commission acknowledges the comment. At the August 8, 2012 commission agenda, the commission added an additional level of pulse flows to measurement points in the Guadalupe River Basin and increased the base flow values for measurement points in the Guadalupe River Basin described in §298.380(c)(1) - (5) and (7).

One individual commented that the quantitative results of scientific instream flow studies, as well as other quantitative analyses by TCEQ staff, GSA BBASC and others, have been used to evaluate flow regimes resulting from the implementation of a range of potentially feasible example projects operated in accordance with a range of potential environmental flow standards. Results of these evaluations indicate that flow variability, water quality, high-flow pulse frequency and freshwater inflows to San Antonio Bay will be maintained, and aquatic habitat will be available in comparable and often greater quantities and frequencies than without the example projects. For these reasons, it is the commenter's opinion that the adoption of the environmental flow standards as proposed by TCEQ staff will maintain sound ecological environments in these basins.

The commission acknowledges the comment. At the August 8, 2012 commission agenda, the commission added an additional level of pulse flows to measurement points in the Guadalupe River Basin and increased the base flow values for measurement points in the Guadalupe River Basin described in §298.380(c)(1) - (5) and (7).

One individual commented that inspection of the results from the ED's balancing analysis suggests that implementation of the instream criteria maintains almost all of the proposed frequencies of occurrence of freshwater inflow regime components that

were specified by the stakeholders for the San Antonio Bay system.

The commission acknowledges the comment.

UGRA commented that that TCEQ's proposed rules properly balance water supply development with environmental needs.

The commission acknowledges the comment. At the August 8, 2012 commission agenda, the commission added an additional level of pulse flows to measurement points in the Guadalupe River Basin and increased the base flow values for measurement points in the Guadalupe River Basin described in §298.380(c)(1) - (5) and (7).

Four individuals commented that TCEQ should balance the needs of humans and the environment. One of these individuals commented that the recommendations submitted by the stakeholder committee very effectively balanced the needs to keep sufficient freshwater available for the bays and estuaries with opportunities to extract water by way of new permits. One of these individuals commented that the stakeholder recommendations already include many compromises that were carefully forged and agreed upon to balance human water supply needs with those of the environment. One of these individuals commented that TCEQ's balancing favored projects for special

interest groups over the environment.

The commission followed its instructions in the statute when drafting the adopted rules. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." The commission has adopted many of the stakeholders' recommendations. The commission followed its instructions in TWC, §11.1471, by balancing human and other competing needs for water with the scientific recommendations. The commission believes that the adopted rules are sufficiently protective of the environment because they include a flow regime consisting of subsistence flows, base flows, high flow pulses, and a freshwater inflow standard. The adopted rules also allow for some future permitting. The rule was not changed in response to this comment.

One individual commented that the scenario used by TCEQ to develop the proposed rule uses a much higher new project yield of 135,000 acre-feet to account for the balancing of environmental and future consumptive water needs. The BBASC used a new project yielding 40,000 acre-feet and is based on the work of the Regional Planning Group in providing for future water demands. The TCEQ's much larger project is not

documented. It is obvious that TCEQ's approach is skewed toward wringing as much water as possible from what little unappropriated water that remains in the system.

The commission acknowledges that the stakeholders performed an analysis of the impacts of the proposed standards on future water supply needs and considered the results of these analyses in their recommendations. The ED also performed an analysis to address the issue of balancing human and other competing needs for water in the basin and bay system and discussed that analysis in the proposal preamble. The ED's selected scenario for the balancing analysis is based on a hypothetical diversion of an amount of water greater than the amount considered by the stakeholders but less than the amount identified in the Regional Water Plan as necessary for future human water needs. The commission notes that the stakeholders balancing analysis required a diversion of more than 40,000 acre-feet of water from the river in order to achieve the project yield. The ED's analysis was not intended as a finding that water is available for a specific project. However, the ED's analysis does address the question of whether new projects could be permitted. When applications for projects are evaluated, water availability is based on specific facts in those applications. No change has been made in response to this comment.

One individual commented that the GSA BBASC group did do modeling to look at a simplified structure and found it would make more water available for diversion for future projects, but it does not recognize or protect all aspects of the flow regime that science says is needed. The commenter believes that one of the tipping points for the stakeholders was that project yield could be obtained with the BBASC recommendations of 22,800 acre-feet per year. That came very close to the 25,000 acre-feet per year yield called for in the Regional Water Plan. So, for pennies on the dollar, the group found a way to protect these key pieces of the flow regime while also allowing for human water supply development with only a very slight increase in the cost to the project. Therefore, to the group, that seemed like a reasonable balancing of needs.

The commission acknowledges that the stakeholders performed an analysis of the impacts of the proposed standards on future water supply needs and considered the results of these analyses in their recommendations. The SAC, in its discussion paper *Moving from Instream Flow Matrix Development to Environmental Flow Standard Recommendations* also notes that WAMs modified through the Regional Planning process to reflect implementation of future projects may not include the same assumptions for existing water rights and prior appropriation as the models used by the commission in its water availability determination for new permits. The commission's understanding is that the stakeholders used a model that

does not appropriately subtract from availability existing water rights valued at their full authorization and included return flows. Such an analysis would therefore overestimate the likelihood that a project could be permitted. The ED also performed an analysis to address the issue of balancing human and other competing needs for water in the basin and bay system using his permitting model, and discussed that analysis in the proposal preamble. The ED's selected scenario for the balancing analysis is based on a hypothetical diversion of an amount of water greater than the amount considered by the stakeholders but less than the amount identified in the Regional Water Plan as necessary for future human water needs. The ED's analysis was not intended as a finding that water is available for a specific project; however, the ED's analysis does address the likelihood that a new project could be permitted. When applications for projects are evaluated, water availability is based on specific facts in those applications. No change has been made in response to this comment.

CCA commented that TCEQ states in conclusory fashion that the ED "performed his own analysis to address the issue of balancing human and other competing needs for water in the basin," but the rule proposal contains no detailed description, no explanation, and no rational basis for that analysis or its conclusions. CCA commented that no interested person can comment meaningfully on a proposal that rests on such

unidentified factual bases. CCA notes that this fatal flaw attends the TCEQ's comments on modeling by the ED for purposes of proposed §298.380 in the Guadalupe/San Antonio River Basin and bay system.

The balancing analysis performed by commission staff is detailed in the preamble to this adopted rule. The statute requires the commission to adopt rules that will apply to the evaluation of new applications for new appropriations of water. When applying the adopted standards in determining availability for applications for new appropriations of water, staff will use its WAMs. Therefore, when performing its balancing analysis, staff used these same WAMs. The WAM used for staff's balancing analysis is available on the TCEQ's public Web site on the Environmental Flows Rulemaking Web page. The model and the discussion of the model application in the Section by Section Discussion for §298.380 provide the rational basis for staff's conclusions.

GBRA commented that in the development of the commission's proposed rule, the ED's balancing analysis considers the impacts of applications of various environmental flow criteria on the annual availability of a single synthetic scenario, specifically a run-of-river diversion in the Guadalupe River Basin. While the ED's analysis focuses upon the potential impact on annual availability of unappropriated flow, consideration of the

monthly availabilities suggests the proposed instream rules have almost a 50% greater impact on the monthly availability of unappropriated flow over comparable results when the Lyons method is applied, and 66% greater impact on monthly availability than if no environmental flow criteria are applied. In the context of water availability, there are significant impacts from the proposed rules when viewed in a monthly context.

The commission acknowledges the comment and responds that its adopted rules are protective of the environment and also leave some water available for future permitting. The commission also responds that in response to this and other comments the Section by Section Discussion for §298.380 has been modified to further discuss the results of its balancing analysis.

GBRA commented that it understands the need for the ED to avoid the suggestion of a finding that water is available for specific projects. Yet it must be further recognized that the evaluation, development, and planning of future water supply is based heavily upon the yield of potential projects. GBRA commented that analysis of the ED's proposed standards suggests a significant impact upon firm yield with no scientifically demonstrated commensurate benefit to the environment. GBRA commented that adoption of a simplified framework with a single level of seasonal subsistence flows, a single level of seasonal "dry" base flows, and the seasonal 2/season pulse amounts identified by the GSA BBEST limit the impacts on water supply while maintaining a

sound ecological environment.

The commission responds that based on information in the science team report and additional scientific information developed by the stakeholders, it appears that a flow regime consisting of only a dry base flow and a subsistence flow would be less protective. The commission acknowledges that more water could be diverted if the environmental flow standards are lower. However, the commission's balancing analysis demonstrates that the standards in the adopted rule also allow for some water to be available for future permits. The rule was not changed in response to this comment.

GRTU commented that with regard to the analysis of balancing, or meeting the environmental flow recommendations to the "maximum extent reasonable considering other public interests and other relevant factors," the commission's justification for the proposed rule is deficient. Though the BBASC represents a wide array of interests they were able to reach consensus on 17 out of 28 of the major issues facing them and an overwhelming majority (better than 19-3) on the rest. They contracted with experts in water resource and ecological science to support their analysis, considered several realistic proposals for future water supply, clearly documented their rationale in the rare instances when they differed from the recommendations of their BBEST and developed innovative approaches to balance the needs of the environment with the needs of people

including a Pulse Exemption Rule and 10% dedication of future projects to the environment. The product of their work was a 130-page report including a 900-page appendix. In contrast, the commission conducted a firm yield analysis of a single hypothetical project, almost certainly not reflective of any project that would realistically be proposed in this basin. For this analysis the commission provided the WAM input files and reported "annual availabilities" (a term not defined but presumably indicating the percent of years in the period of record when 100% of the firm demand is available for diversion).

The commission considered all of the recommendations provided by the science team and the stakeholder groups and other relevant factors, including commission staff's water availability and water quality analyses, when drafting the adopted rules. The ED's analysis was not intended to be a firm yield analysis. It was an analysis of the impacts of the adopted standards on the amount of water a future permit could divert from the river. The annual availability is a calculation of the number of years in the period of record that 135,000 acre-feet of water could be diverted from the river under the specified conditions. The percentage of time that a water right can divert its full amount is the major factor in the determination of whether staff can recommend that a permit be granted.

The commission did not disregard any science team or stakeholder recommendations, but considered all of them and adopted many of the stakeholders' recommendations. The commission further responds that the adopted standards are not based solely on scientific information. No change has been made in response to this comment.

SARA commented that it ran additional analysis on TCEQ's draft standards to determine the impact they would have on the inflows to the bays and estuaries. SARA's analysis showed the TCEQ draft standards would allow water resource project storage facilities to refill faster than they would be allowed to under the GSA BBASC recommendation. The more rapid refilling of storage under the TCEQ proposed standards however came at the expense of inflows to the bays and estuaries in the most critical seasons, Spring and Summer, and would be most damaging as the lower inflows would prolong a drought's impacts.

The commission agrees that a future water rights permit would likely be able to divert more water under the adopted rules than under the stakeholders' recommendations. This is reflected in the results of the ED's balancing analysis presented in the Section by Section Discussion in §298.380, which has been modified in response to other comments. The commission notes that the adopted rules include subsistence flow levels

that will limit diversion during extremely dry periods for permits to which this rule applies. Under SB 3's adaptive management provisions, further analyses and studies will be performed in the future to determine whether the adopted standards, once implemented, continue to protect the environment. The rule was not changed in response to this comment.

SMRF and two individuals commented that one site that TCEQ modeled is in the San Marcos River which makes no sense since there is not enough unpermitted water left in this river to be granting permits to withdraw it. SMRF believes there are many errors in the TCEQ models they used to set up their new proposed rules. Either that or TCEQ is seeing the modeled changes in flows to the bays and ignoring the damage that this will cause, prolonging drought way beyond what the bays can safely be assumed to be able to recover from.

The commission responds that the ED's modeling analysis for the proposed rules did not model a location on the San Marcos River but instead modeled a location on the Guadalupe River upstream of the confluence with the San Marcos River. The ED intended the analysis to be a conservative assessment of the impacts of the adopted standards on water availability. However, in response to other comments, the ED revised the analysis to include a location consistent with that used by the stakeholders, although

the results of the analysis at the new point do not differ from the results of the analysis at the original point. The results of the modeling analysis are included in the Section by Section Discussion for §298.380. The commission responds that it also included freshwater inflow standards in the adopted rule. The rule was not changed in response to this comment.

NWF and Sierra Club-Lone Star commented that there was a mismatch in the spatial location of the theoretical diversion itself and the location of the evaluation of the environmental flow impacts of the diversion under each condition. The theoretical diversion used in the ED's balancing analysis, as was revealed within the WAM files and via communication with staff, is located at a site commonly known as H-5 on the Guadalupe River. Neither the GSA BBEST nor BBASC recommended environmental flow criteria at this site. The nearest site with recommendations by both the BBEST and BBASC, is several miles downstream at Gonzales, below the confluence with the San Marcos River, a major tributary of the Guadalupe River. Thus, flows at the H-5 site do not include contributions from the extensive San Marcos River drainage, which are reflected in the flows at the Gonzales site. However, the environmental flow parameters in the "proposed environmental flow standard" condition and the "stakeholder recommendations" condition were evaluated by the ED by simply taking the values proposed / recommended for the Gonzales site and applying them to the diversion site with no adjustments. The inevitable effect is that a reasonably protective flow standard

recommended by the BBASC for the Gonzales site is unfairly portrayed as being unduly restrictive for water supply at the H-5 location because of an inappropriate modeling assumption. By contrast, because the ED apparently developed a proposed standard for the Gonzales site that would result in a more acceptable annual availability at the H-5 location, the mismatch inevitably forced the proposed standard downward to less protective levels.

The commission responds that it reviewed all of the model files and spreadsheets submitted by these commenters. The commission notes that simply moving the modeled location of the environmental flow standards to the downstream gage would not be an appropriate adjustment to account for the spatial mismatch identified in this comment. However, in response to this and other comments, the ED performed an additional balancing analysis with both the diversion and the environmental flow standards modeled at the point used by the stakeholders. That analysis demonstrates that irrespective of the location where the balancing analysis is performed, the outcome is the same. There would be a higher impact on water available for future permitting under the stakeholders' recommendations. The Section by Section Discussion for §298.380 has been modified to include this additional analysis. The rule was not changed in response to this comment.

NWF and Sierra Club-Lone Star, and Victoria commented that in the ED's evaluation of the condition described as "proposed environmental flow standard," the base flow values utilized in the WAM analyses do not match the base flows listed for the Spring and Summer seasons as "Base" in the proposed rule. TCEQ may have inadvertently used the average HEFR base flows for spring and summer in its impact analysis. NWF and Sierra Club-Lone Star comment that their analysis indicates that application of the stakeholders' recommendations would result in an annual availability of 7% instead of 5% as reported in the proposed rule. Victoria commented that the TCEQ analysis of the impact of the proposed instream flow regime may be understated.

The commission agrees and responds that the ED's balancing analysis was adjusted to reflect this comment. The results of the analysis using the WAM, adjusted to correct the base flow value, indicate that the annual availability with application of the adopted standards would be 25%. The commission also responds that this modification to the WAM used in the balancing analysis did not change the results of the analysis, application of the stakeholders' recommendations result in a greater impact on water available for future permitting. The commission reviewed the models and spreadsheets submitted in support of this comment. The commission notes that the annual availability resulting from application of the stakeholders'

recommendation, using both the WAM files on the commission's Web site and the WAM files submitted in support of this comment is 5%. The Section by Section Discussion for §298.380 was revised to reflect the corrected annual availability of 25%.

NWF and Sierra Club-Lone Star commented that the ED's modeling analyses to balance environmental water needs and other human water supply needs were performed with no storage feature associated with the theoretical diversion. While this is not an irregular modeling approach in the WAM itself, it is incongruous with other efforts to achieve a balance between water supply and other needs for water in the Guadalupe River Basin. It differs from the balancing performed by the stakeholders in which that group examined water supply available with an off-channel reservoir of approximately 105,000 acre-feet capacity. The BBASC devoted a lot of time and financial resources to evaluating impacts of its recommendations on reasonably representative potential water supply projects. Additionally, many of the potential water supply projects in the Regional Plan covering the Guadalupe River Basin, indeed all large diversion options, envision a storage component because of the scarcity of reliable flows during drier times. Such off-channel reservoirs range in size from approximately 105,000 - 190,000 acre-feet. A reasonable balancing analysis must consider variations in potential water supply projects that can efficiently develop water supply in compliance with reasonably protective environmental flow standards. These commenters state that the BBASC had

already reduced the BBEST recommendations when they performed their balancing and the TCEQ should not have reduced it further. The theoretical project as evaluated by the ED does not present a reasonable basis for analysis, and attempting, as the ED appears to have done, to come up with sufficiently weakened proposed standards to increase the annual availability value for the ill-suited hypothetical project up to about the same level as for the Default Methodology is not a reasonable approach.

The commission responds that it did not intend for its balancing analysis to be a finding that water was available for a specific project. The ED did not include a storage component in the modeling to support the balancing analysis because simply adding storage does not increase the amount of water a water right could divert from the river or the reliability of that diversion. Permitting decisions for an off-channel project would be based on the amount of water an applicant could divert from the river and there would need to be a reasonable amount of water available in the river that meets the criteria in the commission's statutes and rules. If the reliability of the river diversion is low, it could be difficult to recommend granting a permit. The commission notes that it has adopted many of the stakeholders' recommendations. Further, the commission believes that the adopted rules are sufficiently protective of the environment because they include a flow regime consisting of subsistence flows, base flows, high flow

pulses, and a freshwater inflow standard. The rule was not changed in response to this comment.

Victoria and two individuals commented on the WAMs used in the ED's balancing analysis. Victoria is concerned with using a WAM based on monthly data to forecast the impact of the proposed environmental flow regime on water supply when it appears that future projects will be based on daily diversions from the streams rather than impoundments on the streams. Victoria believes this may substantially overstate water availability, because water will be counted as available that is not actually available when realistic daily diversion capabilities and daily instream flow criteria are taken into account.

The commission responds that it has been clear from the beginning of this process that it would use its WAMs to perform its balancing. At a meeting with the stakeholders staff noted that water availability determinations for new permits are based on the commission's WAMs. The commission respectfully disagrees that using a monthly model overstates water availability because a major factor that determines whether a new permit can be issued is if there is sufficient water available for the application after the needs of all senior water rights are satisfied. The rule was not changed in response to this comment.

NWF commented that it does not feel that there is adequate justification for the changes that were made. There just simply isn't the rationale there that indicates what was behind it. It was not clear that there were environmental assessments done to analyze what effect these changes would have on the environment, and that's very concerning. The BBASC really worked hard to do the balancing, and we're very concerned that there were some questionable positions made in the analysis to determine what the yield would be, and that there really is a large portion of the flow that's ignored and that isn't recognized, and that's concerning as well.

The commission has made efforts to be transparent in the process of developing the adopted rules. The commission considered information in the science team report, the SAC's review of this report, the stakeholder reports, comments on the proposed rules and supporting information for those comments, and performed water quality and water availability analyses. Staff provided detailed information and explanations of the modeling, science, and balancing, including a discussion of the differences in the models that were used by the stakeholders and TCEQ. This information was presented at two separate meetings with interested stakeholders, including the BBASC. These meetings were held after the proposal to discuss the information included in the preamble in order to

assist these groups with developing comments on the proposed rule and to listen to their concerns. In addition to these meetings, staff also responded to a number of individual requests for information and explanation, including requests from members of the BBEST and the consultant for the BBASC committee after the proposal in order to provide further assistance. The commission acknowledges that the stakeholders performed an analysis of the impacts of the proposed standards on future water supply needs and considered the results of these analyses in their recommendations. The ED also performed an analysis to address the issue of balancing human and other competing needs for water in the basin and bay system and discussed that analysis in the proposal preamble. The commission did not disregard any science team or stakeholder recommendations, but considered all of them. However, the commission respectfully disagrees that it had to adopt the recommendations in their entirety because SB 3 clearly provides that the commission perform its own review of the stakeholders' recommendations. As provided in TWC, §11.02362(o), the stakeholders develop recommendations not final environmental flow standards, and send their recommendations to the commission. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant

factors." The rule was not changed in response to this comment.

§298.380(a) and (b), Environmental Flow Standards (Freshwater Inflows)

UGRA commented that additional rules for the bays and estuaries are not needed since compliance with instream environmental flow standards will maintain a sound estuarine ecological environment.

The commission responds that maintaining healthy bay systems is important. Therefore, the commission included freshwater inflow standards in the adopted rule for the protection of bays and estuaries. No change was made in response to this comment.

GBRA commented that in §298.380(a)(1), and (2), and (b), the ED has proposed a detailed regime of 18 freshwater inflow criteria for the San Antonio Bay System for the Spring and Summer Seasons (although GRBA recognizes that several of these components are utilized to describe requirements of joint probabilities). The preamble of the proposed rule states, "{t}he commission agrees with the stakeholders that, for months where there is no freshwater inflow standard in the proposed rule, application of the proposed instream flow standards to water right applications subject to this subchapter should provide sufficient flow to the bays and estuaries." While true for the winter and fall, this fact is also true for the spring and summer as well. Given present

surface water planning in Region L, the work of the stakeholders' technical consultants demonstrates that the simplified framework for instream criteria are protective of the San Antonio Bay System, as the simplified framework yields almost exactly the same freshwater inflow regime as the full stakeholder recommendations (specifically, there is a difference of a single year of flows out of a 49-year period). Inspection of the results from the ED's balancing analysis suggest that implementation of the instream criteria maintain almost all of the proposed frequencies of occurrence' specified for the San Antonio Bay System.

The commission agrees that its adopted standards are protective of instream flows and freshwater inflows.

GBRA commented that significant uncertainties exist in the salinity zonation analyses utilized in the development of the proposed standards, yet these uncertainties have not been quantified. Recognizing that the ED must work with information available, it must be noted that the science does not support the level of detail in the majority recommendations, nor in the proposed standards.

The commission responds that healthy bay systems are important. The commission reviewed the science team and stakeholder reports and based on information in these reports, the commission included freshwater

inflow standards in the adopted rule for the protection of bays and estuaries. The commission acknowledges that further analyses and studies may need to be performed in the future to determine whether the adopted standards, once implemented, are protective. HB 3/SB 3 contemplate that this data and new studies can be considered through adaptive management via the work plan for this basin and bay system. To the extent that additional information becomes available through monitoring and studies undertaken under the work plan, the science team could consider that information in future deliberations. The rule was not modified in response to this comment.

One individual commented that San Antonio Bay is, without a doubt, an extremely important component of the basin: environmentally, economically and recreationally. The proposed standards for the San Antonio Bay System create difficulties that gain nothing in terms of environmental flow protection that the simplified instream criteria themselves, if those are used, do not already achieve. For these reasons, explicit standards should not be included for the San Antonio Bay System, rather just utilize the instream flow criteria.

The commission responds that healthy bay systems are important. The commission reviewed the science team and stakeholder reports and based

on information in these reports, the commission included freshwater inflow standards in the adopted rule for the protection of bays and estuaries. The commission acknowledges that further analyses and studies may need to be performed in the future to determine whether the adopted standards, once implemented, are protective. HB 3/SB 3 contemplate that this data and new studies can be considered through adaptive management via the work plan for this basin and bay system. To the extent that additional information becomes available through monitoring and studies undertaken under the work plan, the science team could consider that information in future deliberations. The rule was not changed in response to this comment.

GEAA and TPWD commented on the impacts of reduced instream requirements on the bays. TPWD commented that, as drafted, the TCEQ's reduced instream pulse flow requirements will reduce inflows to the San Antonio Bay System. Reduced freshwater inflows will have negative consequences for the bay system by prolonging high salinities during dry conditions, among other things. For example, reduced freshwater inflows during 2011 led to record high salinities in Texas estuaries that contributed to a coast-wide red tide harmful algal bloom event. Fish mortality associated with this red tide event is estimated to be 4.4 million. In addition, the commercial oyster season was closed and fishery disaster declarations issued, resulting in estimated economic losses

exceeding \$7.5 million. TPWD recommends that the rules use the San Antonio Bay freshwater inflows recommended by the GSA BBASC. GEAA commented that the stakeholder recommendations for protecting bays and estuaries are based in part on the assumption that the stakeholder recommendations for streamflow would be honored by TCEQ.

The commission responds that maintaining healthy bay systems is important. Therefore, the commission included freshwater inflow standards in the adopted rule for the protection of bays and estuaries. The commission notes that the adopted rules include subsistence flow levels that will limit diversions during extremely dry periods for permits to which this rule applies. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." The commission followed its instructions in TWC, §11.1471, to determine these flow standards. It considered all of the recommendations provided by the science team and the stakeholder groups and other relevant factors, including balancing human and other competing needs for water, when drafting the adopted rules. Among the factors it considers are the impacts of the adopted standards on future permitting, and this determination is

basin specific. Using the stakeholder recommendations would not leave a water availability window for future permitting. Therefore, the commission proposed up to a 10% change in attainment frequencies to be applied during the water availability determination for new appropriations to allow for some potential future permitting. In response to this and other comments, the commission modified §298.380(a) to reduce the 10% allowable impairment, where possible, to 5% or 8% depending on the specific inflow regime and to clarify how the allowable impairment will be calculated and applied in water availability determinations for new water rights or amendments subject to this subchapter. Under SB 3's adaptive management provisions, further analyses and studies will be performed in the future to determine whether the adopted standards, once implemented, continue to protect the environment. The commission believes that the adopted rules are sufficiently protective of the environment.

ICF and two individuals expressed concerns about the impact of the proposed rules on bays and estuaries. ICF commented that the reduction of freshwater inflows into our Texas bays has already impacted commercial fisheries and overall productivity. It is TCEQ's directive to provide water for people while maintaining a sound ecological environment. One of these individuals commented that the rules will cause a great economic and ecological disaster in a large segment of South Texas.

The commission agrees that healthy bay systems are important for economic and ecological reasons. The commission included freshwater inflow standards in the adopted rule for the protection of bays and estuaries. The commission balanced human and other competing needs for water in developing these standards. Applications for new appropriations will be evaluated to ensure that the volumes and frequencies in the adopted standards are not impaired while still leaving some water available for future permitting. No changes were made in response to this comment.

NWF and Sierra Club-Lone Star commented that each of the potential impacts to a sound ecological environment noted by the Estuary Subcommittee are offset by the assumption that the full BBEST recommended criteria are in place and that high inflow events will continue to offset the deleterious impact of low flow periods. However with the proposed TCEQ rules, these assumptions are not valid and there is no evidence presented by TCEQ that a sound ecological environment would be supported, as potential adverse impacts to water quality, habitat suitability and availability, indices of biologic integrity, estuarine salinity patterns, sediment transport, nutrient delivery and species occurrence, abundance, endangered species, diversity are not protected against with these proposed rules. TCEQ in their proposed rules argue that high inflow events, such as overbank flows, "result from naturally occurring large rainfall events, which will

likely continue to occur." However, as the proposed rules provide only limited protection for high flow pulses and no protection for overbank flows, such assumptions are not justified.

The commission acknowledges that overbank flows are a component of a flow regime for a sound ecological environment. However, these flows have the potential to inundate low-lying areas. The flows the commission is protecting in the adopted rule are not calculated to result in water flowing out of the banks of the river. As noted elsewhere in the preamble, overbank flows are the result of naturally occurring large rainfall events which will likely continue to occur. The commission also notes that high rainfall events should continue to produce these flow levels. Review of the Regional Water Plans did not identify future large on-channel reservoir projects that would impair high flow pulses or overbank flows. The commission has adopted many of the stakeholders' recommendations. Further, the commission believes that the adopted rules are sufficiently protective of the environment because they include a flow regime consisting of subsistence flows, base flows, high flow pulses, and a freshwater inflow standard. Under SB 3's adaptive management provisions, further analyses and studies will be performed in the future to determine whether the adopted standards, once implemented, continue to protect the environment. The

rule was not changed in response to this comment.

GBRA commented that the ED's attempt to consider an appropriate "balancing" of environmental flow needs and other human uses is commendable, as such consideration of these human needs by the stakeholder committee has been sorely lacking (particularly with regard to important economic considerations). However, there exists significant uncertainty regarding the determination of "impairment" to the frequency of achieving estuarine criteria. The frequencies for the standard have not been specified, and are proposed to be established by 10% impairment from the baseline values in the commission's WAMs in effect at the time the first application for a water right permit or amendment subject to this subchapter is considered. In essence, frequencies that have not been identified yet are being proposed as a standard. Further, how this 10% impairment is to be assessed remains unclear, and would require that §298.380(a) be clarified such that: 1) the 10% impairment to the identified frequencies is to be applied individually to each freshwater inflow component (e.g., Spring 1, Spring 2) for which a frequency is identified; and 2) the 10% impairment is derived via addition or subtraction to each individual frequency criterion rather than by multiplication to the frequency criterion (i.e., if a frequency of no less than 30% is identified, than application of the 10% impairment would result in a standard target frequency of no less than 20%).

The commission responds that the WAM to be used for a specific

application will be available to applicants and other entities who request the model at the time the application is processed. In response to other comments, the commission modified §298.380(a) to reduce the 10% allowable impairment, where possible, to 5% or 8% depending on the specific inflow regime. In response to this and other comments, the commission modified §298.380(a) to clarify how the allowable impairment will be calculated and applied in water availability determinations for new water rights or amendments subject to this subchapter.

NWF and Sierra Club-Lone Star commented that the assessment approaches to be used for the specific inflow regimes are not stated in the current figures or elsewhere in the proposed rules. Some explanation is required for how the assessment will be undertaken and for whether an increase in value is to be avoided or a decrease in value. For example, as explained in the BBASC Report for some inflow regimes, the value to be assessed is the ratio of years with certain inflow levels, which is a subset of the total category, to the total number of years in the category. NWF and Sierra Club-Lone Star recommend that the figures in §298.380(a)(1) and (2) be revised to specify whether an increase or decrease is to be avoided and clarify calculation of the values for certain inflow levels.

The commission agrees that how impairment of the inflow regime will be

calculated during the water availability determination for new appropriations of water could be clarified. In response to this and other comments, the commission modified §298.380(a) to provide this clarification.

GBRA and Victoria commented that the proposed "strategy target frequencies" present additional issues that warrant further consideration. GBRA commented that the ED's specification of such "strategy target frequencies" exceeds the mandate of SB 3 as specified in TWC, §11.1471(b)(4), which states the commission shall consider, "the recommendations developed by the applicable basin and bay area stakeholders committee under §11.02362(0) regarding environmental flow standards and strategies to meet the flow standards." The "strategy target frequencies" enumerated within the proposed rule do not reflect "strategies to meet the standards," but rather establish a target higher than the standard which permitted strategies should strive to achieve. While GBRA supports that any strategies to meet the standards should be voluntary, these targets introduce further ambiguity and uncertainty into the proposed rule. The "strategy target frequency" for "Spring 4 and Spring 5 combined" is vague, as the interpretation could be either "Spring 5 should occur in less than 67% of the total occurrences of Spring 4 and Spring 5 combined," or "Spring 4 and Spring 5 combined should occur less than 67% of the total occurrences of conditions."

The commission respectfully disagrees that the "strategy target frequencies" cannot be included in the commission's rules. These frequencies would provide a benchmark for future permit amendments for the purpose of providing additional freshwater inflows to the bays and estuaries.

Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." TWC, §11.002(17), defines "environmental flow standards" as "those requirements adopted by the commission under Section 11.1471."

Additionally, the science teams are required to develop "a recommended environmental flow regime" for the system. "Environmental flow regime" is defined as a "schedule of flow quantities that reflects seasonal and yearly fluctuations that typically would vary geographically, by specific location in a watershed, and that are shown to be adequate to support a sound ecological environment and maintain the productivity, extent, and persistence of key aquatic habitats in and along affected water bodies."

TWC, §11.1471(b)(4), providing that "the recommendations developed by the applicable basin and bay area stakeholders committee under Section 11.02362(0) regarding environmental flow standards and strategies to meet the flow standards," does not conflict with the inclusion of strategy target frequencies in the adopted rule. The adopted rule also provides protections for voluntary strategies to meet the standards that are included in water rights permits. In response to this and other comments, the commission modified §298.380(a) to reduce the 10% allowable impairment, where possible, to 5% or 8% depending on the specific inflow regime and to clarify how the allowable impairment will be calculated and applied in water availability determinations for new water rights or amendments subject to this subchapter.

Victoria commented that San Antonio Bay is without a doubt an extremely important component of the region from an environmental, economical, and recreational standpoint. The instream criteria have been repeatedly shown by stakeholders' and the ED's analyses to be adequate to support the environmental needs of the San Antonio Bay System given present surface water planning. Assessment of the 18 estuarine criteria adds additional unnecessary complexity to the permitting process, and requires additional labor for evaluation. In addition, significant uncertainty comes from the proposed estuarine standard being contingent on a model scenario that is yet to exist

and that presently lacks a specification of required frequencies. Victoria is uncertain whether the bay and estuary matrices are necessary. It is Victoria's understanding that, based on the analysis of the hypothetical projects that have been examined to date, satisfaction of the proposed instream flow regime results in freshwater inflows that the BBEST and the BBASC believed were protective of the San Antonio Bay system. Victoria finds the use of the proposed matrices overly complicated and confusing. Based on Victoria's understanding of the analyses that have been performed, the ED should not include explicit standards for the San Antonio Bay System, and should withdraw §298.380(a) and (b) and §298.355(4), (5), and (8).

The commission responds that healthy bay systems are important. The commission reviewed the science team and stakeholder reports based on information in these reports, the commission included freshwater inflow standards in the adopted rule for the protection of bays and estuaries. In response to this and other comments, the commission modified §298.380(a) to reduce the 10% allowable impairment, where possible, to 5% or 8% depending on the specific inflow regime and to clarify how the allowable impairment will be calculated and applied in water availability determinations for new water rights or amendments subject to this subchapter.

The commission acknowledges that further analyses and studies may need to be performed in the future to determine whether the adopted standards, once implemented, are protective. HB 3/SB 3 contemplate that this data and new studies can be considered through adaptive management via the work plan for this basin and bay system. To the extent that additional information becomes available through monitoring and studies undertaken under the work plan, the science team could consider that information in future deliberations. The rule was not modified in response to this comment.

GBRA and Victoria commented that the proposed standards for the San Antonio Bay System create an operational dilemma that gains nothing in terms of environmental flow protection. These commenters request that the ED not include explicit standards for the San Antonio Bay System, and should withdraw §298.380(a) and (b) and §298.355(4), (5), and (8). The work plan and adaptive management process established by SB 3 and presently under development by the stakeholders allows the opportunity to monitor the effectiveness of these instream criteria, and continued consideration of the necessary components of the freshwater inflow regime and their associated frequencies of occurrence.

The commission responds that healthy bay systems are important. The

commission reviewed the science team and stakeholder reports and based on the information in these reports, the commission included freshwater inflow standards in the adopted rule for the protection of bays and estuaries. Adopted §298.380(a) specifies that these standards would be applied during the water availability determinations for new appropriations of water and therefore could not impact operation of any permit to which the standards apply. The commission acknowledges that further analyses and studies may need to be performed in the future to determine whether the adopted standards, once implemented, are protective. HB 3/SB 3 contemplate that this data and new studies can be considered through adaptive management via the work plan for this basin and bay system. To the extent that additional information becomes available through monitoring and studies undertaken under the work plan, the science team could consider that information in future deliberations. The rule was not modified in response to this comment.

CCA commented that one critical component of environmental flow standards is bay and estuary inflow standards and a critical component of these standards is the frequency at which they will be met. CCA commented that the commission can reduce science-based environmental flow standards developed by the BBEST on the ground that the BBEST's science is wrong but must provide a reasoned justification showing in what respect and

to what extent the BBEST's science is wrong. The April 13, 2012, notice contains no such explanation. The TCEQ may also reduce environmental flow standards below the science even if it does not dispute the science. But to do so, TCEQ must explain why the particular reduction it proposes below the science is "the maximum extent reasonable considering other public interests and other relevant factors." And to make that explanation satisfy the reasoned justification requirements, the TCEQ must specify each such other public interest and other relevant factor that makes its choice of its specific below-science based flow standards the "maximum extent reasonable," and the relevant facts, and show that that factor makes the reduced environmental flow standard the maximum extent reasonable. The April 13, 2012, notice contains no such explanation. TCEQ cannot just point to a BBASC recommendation because it alone has the authority to adopt appropriate environmental flow standards, and to make the decision that non-science factors require a specific reduction below the science. The fact that a BBASC has recommended a reduction in the science-based standards based on its view of the maximum extent it would be reasonable to follow the science is not, in itself, any reasoned justification whatsoever for the TCEQ to adopt that reduction. The BBASC recommendation for freshwater inflows to San Antonio Bay provides no reasoned justification for the specific recommendation of 18% summer season non-attainment instead of the science based 6%. TCEQ's proposed 10% additional departure even from the BBASC recommendation requires its own justification in terms of the specific non-science factors, and as to each factor, the specific facts that makes this additional

departure from science reasonable. The April 13, 2012, contains no such explanation.

The commission respectfully disagrees that this level of detail is required, or even reasonable for this rulemaking. The science team for this basin and bay system developed a recommended environmental flow regime, or schedule of flow quantities adequate to support a sound ecological environment. The stakeholders for this basin took the science team's recommendations and considered those recommendations in conjunction with other factors, including the present and future needs for water for other uses. The commission considered all of the recommendations provided by the science team and the stakeholder groups and other relevant factors, including commission staff's water availability analyses, when drafting the adopted rules. Therefore, the adopted standards are not based solely on scientific information. The commission followed its instructions in TWC, §11.1471, by balancing human and other competing needs for water with the scientific recommendations.

The commission takes very seriously its charge from the legislature to provide to the extent practicable for freshwater inflows and instream flows necessary to maintain the viability of the state's streams, rivers, and bay and estuary systems. The legislature has recognized that these

environmental interests must be balanced by the commission with "all other public interests." It is not possible or practicable to catalog a precise weighing of countervailing interests that went into the commission's decision and is not required by statute. However, as explained elsewhere in this preamble, one of the important factors for the commission was to preserve the ability to permit at least some future surface water projects for human needs. The commission has provided a more complete explanation of its decision in this preamble. In addition, the information used by the ED in performing his balancing analysis is available on the commission Web site. The rule was not changed in response to this comment.

NWF and Sierra Club-Lone Star commented that there is no justification provided in the proposed rule for the proposed reduction in the GSA bay and estuary freshwater inflow protections by 10% below the levels recommended by the GSA BBASC. There is nothing in the proposed rule that indicates using the BBASC freshwater inflow attainment frequencies would result in an unreasonable adverse impact to other public interests. The inflow regimes included in the proposed rules incorporate, for the drier period regimes, much lower protections, even without the 10% relaxation, than those indicated by the GSA BBEST as being adequate to support a sound ecological environment. The GSA BBASC undertook a balancing exercise and determined the reasonable water supply development could occur with the inflow regimes recommended by the BBASC.

Additional weakening of those protections below the levels recommended by the BBASC are not justified. Accordingly, the commenting parties recommend that subsection (a) be revised as follows: "(a) A water right application in the Guadalupe and San Antonio River Basins and the San Antonio-Nueces Coastal Basin, which increases the amount of water authorized to be stored, taken, or diverted as described in §298.10 of this title (relating to Applicability), shall not cause or contribute to an impairment of the inflow regimes as described in the figures in this subsection. Impairment of the inflow regime shall be evaluated as part of the water availability determination for a new water right or amendment that is subject to this subchapter. For purposes of this subsection, impairment would occur if the application, when considered in combination with any authorizations subject to this subchapter, which were issued prior to this application, would impair the modeled permitting frequency of any inflow regime."

The commission respectfully disagrees that it had to adopt the stakeholders' recommendations in their entirety because SB 3 clearly provides that the commission perform its own review of the stakeholders' recommendations. As provided in TWC, §11.02362(o), the stakeholders develop recommendations, not final environmental flow standards, and send their recommendations to the commission. The commission considered all of the recommendations provided by the science team and the stakeholder groups and other relevant factors, including balancing human and other

competing needs for water, when drafting the adopted rules. Among the factors it considers are the impacts of the adopted standards on future permitting, and this determination is basin specific. Using the stakeholder recommendations would not leave a water availability window for future permitting. In addition to providing an availability window for future permitting, the allowable impairment recognizes that the WAMs for these basins could change prior to consideration of the first application for a new appropriation subject to these rules. Therefore, the commission proposed up to a 10% change in attainment frequencies to be applied during the water availability determination for new appropriations to allow for some potential future permitting. In response to this and other comments, the commission modified §298.380(a) to reduce the 10% allowable impairment, where possible, to 5% or 8% depending on the specific inflow regime and to clarify how the allowable impairment will be calculated and applied in water availability determinations for new water rights or amendments subject to this subchapter.

One individual expressed concern that the bay system will not survive under the proposed rule, which would decimate a very valuable economy in Texas. While the BBASC adopted attainment frequencies for freshwater inflow protections, are a "make it no worse" approach, the proposed rule allows for a 10% reduction to those numbers.

The proposed rule also omits the 10% dedication that stakeholders recommended as well as not protecting instream pulses larger than seasonal pulses that are critical to bay and estuary health. Yet the proposed rule boldly claims that somehow it would be protective of a sound ecological environment.

The commission agrees that healthy bay systems are important. The commission included freshwater inflow standards in the adopted rule for the protection of bays and estuaries. In response to this and other comments, the commission modified §298.380(a) to reduce the 10% allowable impairment, where possible, to 5% or 8% depending on the specific inflow regime and to clarify how the allowable impairment will be calculated and applied in water availability determinations for new water rights or amendments subject to this subchapter.

The commission notes that these rules are intended to apply to new appropriations of water. The commission is unable to require a 10% dedication of water to the environment by applicants for new appropriations. TWC, §11.0235(d), states "The legislature has not expressly authorized granting water rights exclusively for: (1) instream flows dedicated to environmental needs or inflows to the state's bay and estuary systems; or (2) other similar beneficial uses."

Further, the commission believes that requiring this dedication would encourage applicants for new appropriations to request more water than they need. The rule was not changed to include the 10% dedication.

ICF, SMRF, and three individuals commented on the stakeholders' recommendation of a 10% dedication. ICF commented that the minimal recommendations sent forward by the BBEST and BBASC had been significantly reduced by resulting TCEQ proposed rules. ICF recommended that TCEQ rethink the proposed rules and amend them to include the recommendations from the BBASC concerning 10% return flow incentives in conjunction with the flow recommendations put forward by the BBEST. SMRF commented that the stakeholders saw the 10% dedication as following the process that was used in Corpus Christi where there is a stakeholder group that works out the details of how wastewater might be dedicated to helping recover the bay and estuary system. SMRF saw this as a type of committee that could exist in the future, that would be regional and locally based, that could help make recommendations as scientific information came in so that some water could be dedicated to make up for the fact that already so much water has been dedicated in this basin that the bays and estuaries are in trouble. SMRF also commented that this 10% dedication was not to be the kind of thing where people would apply for more water than they needed, but rather, find innovative strategies to perhaps dedicate a portion of their wastewater flows or other strategies that

would allow this 10% dedication to help. Two of these individuals commented that the 10% dedication recommended by the stakeholders was an effort to improve the condition of our rivers and bays gradually, and is a step toward finding ways to get some wastewater discharges planned to actually continue to be discharged in the future, for the benefit of rivers and bays, or to get people to donate old senior water rights to keeping rivers flowing, which could have a huge impact if people knew the water would stay in the rivers. TCEQ is not listening to the stakeholders about enacting this very important 10% dedication item.

The commission respectfully disagrees that this dedication can be required because these rules are intended to apply to new appropriations of water. The commission is unable to require a 10% dedication of new water to the environment by applicants for new appropriations. TWC, §11.0235(d), states "The legislature has not expressly authorized granting water rights exclusively for: (1) instream flows dedicated to environmental needs or inflows to the state's bay and estuary systems; or (2) other similar beneficial uses."

Further, the commission believes that requiring this dedication would encourage applicants for new appropriations to request more water than they need. In addition, some strategies, for example those for return flows,

would require a water right permit for the water to be protected and as discussed above the commission is unable to grant new water rights for environmental uses. No change has been made in response to this comment.

SARA requested that the commission include the GSA BBASC recommended dedication of water to the environment from new permits or amendments equal to 10% of the yield of the permit or amendment. Since the publishing of the draft standards, TCEQ has on several occasions mischaracterized the GSA BBASC's 10% dedication of water for the environment as requiring water right applicants to request an additional 10% over and above their actual needs. The recommended 10% dedication was proposed by the GSA BBASC as a way to catalyze the use of the Recommendation Report outlined strategies as well as others that may become viable. Thus the 10% dedication can be met by any number of strategies included in the BBASC Recommendation Report and Work Plan for Adaptive Management and would not require applicants to request 10% additional water beyond their needs.

The commission respectfully disagrees that it can require this dedication because these rules are intended to apply to new appropriations of water. The commission is unable to require a 10% dedication of water to the environment by applicants for new appropriations. TWC, §11.0235(d),

states "The legislature has not expressly authorized granting water rights exclusively for: (1) instream flows dedicated to environmental needs or inflows to the state's bay and estuary systems; or (2) other similar beneficial uses." Further, the commission believes that requiring this dedication would encourage applicants for new appropriations to request more water than they need. The rule was not changed in response to this comment.

NWF and Sierra Club-Lone Star commented that the rationale in the proposed rule for deleting the GSA BBASC 10% dedication to the bay and estuary system is unfounded. The stated justifications for not including the 10% dedication to the bay and estuary are that the proposed flow standards are protective of the environment without the 10% dedication. The rule also states that requiring the dedication would encourage applicants to request more water than needed. NWF and Sierra Club-Lone Star were unable to find any support for the statement that the proposed standards are protective without the 10% dedication. To our knowledge, no environmental assessment of the proposed standard was conducted and, certainly, no such assessment is referenced in the proposed rule package. As noted previously, there is no clear basis for contending that the full suite of BBASC recommendations is adequate to support a sound ecological environment. Considering the proposed rule strips away three additional key pieces of the GSA bay and estuary protections: 1) omission of large pulse flow protections that

would protect delivery of water to the bay: overbank pulses as well as all large pulses in the Guadalupe Basin; 2) three tiers of base flows that reflect hydrologic conditions (in the Guadalupe); and 3) a 10% reduction to freshwater inflow attainment frequencies- this is more than a stretch. Concerning the second statement about encouraging requests for more water, it has always been our understanding that TCEQ is charged with evaluating the reasonableness of all applications and with only granting the amount needed. However, more fundamentally, the stakeholder committee's recommendations are clear in supporting flexibility for meeting the equivalent of a 10% dedication, including through methods like dedicating a portion of return flows produced as a result of the new project.

The commission agrees that healthy bay systems are important. The commission reviewed the science team and stakeholder reports and based on information in these reports, the commission included freshwater inflow standards in the adopted rule for the protection of bays and estuaries. However, these rules are intended to apply to new appropriations of water. The commission is unable to require a 10% dedication of water to the environment by applicants for new appropriations. TWC, §11.0235(d), states "The legislature has not expressly authorized granting water rights exclusively for: (1) instream flows dedicated to environmental needs or inflows to the state's bay and estuary

systems; or (2) other similar beneficial uses." Further, the commission believes that requiring this dedication would encourage applicants for new appropriations to request more water than they need. In addition, some strategies, for example those for return flows, would require a water right permit for the water to be protected and the commission is unable to grant new water rights for environmental uses.

The commission acknowledges that overbank flows and flushing flows are a component of a flow regime for a sound ecological environment. However, these flows have the potential to inundate low-lying areas. The flows the commission is protecting in the adopted rule are not calculated to result in water flowing out of the banks of the river. As noted elsewhere in this preamble, overbank flows are the result of naturally occurring large rainfall events which will likely continue to occur. The commission further responds that, as discussed in more detail elsewhere in this response, its adopted rules maintain flow variability in the Guadalupe River after diversions by water rights which are subject to these standards. Finally, in response to other comments, the commission modified §298.380(a) to reduce the 10% allowable impairment, where possible, to 5% or 8% depending on the specific inflow regime and to clarify how the allowable impairment will be calculated and applied in water availability

determinations for new water rights or amendments subject to this subchapter. The commission believes the adoptive standards are protective of the environment and allow for some future permitting.

NWF and Sierra Club-Lone Star commented that the 10% dedication requirement for new appropriations, as recommended by the GSA BBASC, is a necessary component of a package to contribute towards protecting a sound ecological environment. New appropriations, even when subject to other aspects of the flow standards, will reduce inflows to the bay system. Neither the BBASC recommended flow standards nor the proposed rules would be adequate to achieve the inflow levels recommended by the GSA BBEST as being adequate to support a sound ecological environment. In order to help offset those reduced inflows to some degree in order to get closer to supporting a sound ecological environment, the BBASC included the 10% dedication concept. The concept incorporates a flexible approach that would allow a permit holder to pursue alternate means of achieving the 10% amount without necessarily releasing water from the project. This type of permit condition is not unprecedented and is not inconsistent with SB 3. These commenters recommended that a new §298.385(c) be added to include the 10% dedication in the adopted rule and require the commission to ensure that dedicated water is legally protected from diversions and flows to the bay.

The commission responds that these rules are intended to apply to new

appropriations of water. The commission is unable to require a 10% dedication of water to the environment by applicants for new appropriations. TWC, §11.0235(d), states "The legislature has not expressly authorized granting water rights exclusively for: (1) instream flows dedicated to environmental needs or inflows to the state's bay and estuary systems; or (2) other similar beneficial uses."

Some strategies, for example those for return flows, would require a water right permit for the water to be protected and the commission is unable to grant new water rights for environmental uses. Regarding protection of water dedicated from a new appropriation, water rights are administered in accordance with the prior appropriation doctrine where senior water rights can divert before more junior water rights. Once water passes the diversion point of a water right subject to this subchapter, that water is available for diversion by senior water rights located downstream in accordance with their priority date.

Under §298.380(a), the determination of impairment would be part of the water availability determination for new appropriations of water. The commission does not intend for this determination to result in special conditions in new water rights subject to this subchapter. However, the

commission's adopted §298.380(d) provides that applications for new appropriations of water not be allowed to reduce the modeled permitting frequency below the levels that would occur with voluntary permitted strategies in place. The rule was not changed to include the 10% dedication.

OPIC commented that the proposal also argues that a 10% dedication, as proposed by the stakeholder committee for the GSA BBASC, would simply encourage applicants to request more water than necessary. Water rights are dependent upon the amount of water the right holder has beneficially used under TWC, §11.025 and §11.026. Any water above that amount or for a different purpose is not considered appropriated or perfected. If applicants for valuable water rights can so easily obtain an amount 10% above what they beneficially use, whether the 10% dedication creates an additional incentive is rather beside the point.

The commission agrees that an applicant cannot easily obtain an amount of water over 10% of what it needs. However, an applicant could be able to show that it can beneficially use a certain amount, and that it could beneficially use another higher amount, both of which are possibly available. The applicant may choose to request the upper amount in order to obtain enough water to provide the 10% dedication, not because they want or need that amount at the present time. In addition, the commission

notes that these rules are intended to apply to new appropriations of water. TWC, §11.0235(d), states "The legislature has not expressly authorized granting water rights exclusively for: (1) instream flows dedicated to environmental needs or inflows to the state's bay and estuary systems; or (2) other similar beneficial uses." Therefore, the commission is unable to require a 10% dedication of water to the environment by applicants for new appropriations. The rule was not changed in response to this comment.

NWF and Sierra Club-Lone Star commented that the language of proposed §298.380(b) closely matches the GSA BBASC recommendations. However, one aspect of that language is problematic. As drafted, the language could be read as indicating that improvements in inflows as a result of the implementation of strategies would only be protected if those improvements actually fully meet the freshwater inflow standards rather than if they merely incrementally help to get closer to meeting those standards. The commenters hope that TCEQ's intent is to protect incremental improvements along the path to meeting the standard because proceeding in incremental steps will be essential. That certainly is what the commenters understand that the GSA BBASC intended. The commenters requested that §298.380(b) be revised to add the word "help."

The commission agrees and §298.380(b) has been modified to include this

change.

NWF and Sierra Club-Lone Star commented that the needed freshwater inflow protections cannot be achieved solely through the freshwater inflow standards because, among other things, those inflow protections only cover two seasons. During the remaining months, inflow protections are dependent on protections provided through instream flow criteria. Best available science indicates that at least the levels of instream flow protections recommended by the GSA BBEST are needed in order to provide adequate inflows during those remaining months to protect a sound ecological environment. The GSA BBASC recommended, as a result of its balancing exercise, some relaxation of those instream flow protections. There certainly is not an adequate basis to support a statement that a sound ecological environment in the bays can be maintained without including instream flow standards at least as protective as those recommended by GSA BBASC and even those recommended by the BBEST. The commission has not provided adequate support for this contention.

The commission considered all of the recommendations provided by the science team and the stakeholder groups and other relevant factors, including balancing human and other competing needs for water, when drafting the adopted rules. Among the factors it considers are the impacts of the adopted standards on future permitting, and this determination is

basin specific. Using the stakeholder recommendations would not leave a water availability window for future permitting. Therefore, the commission proposed up to a 10% change in attainment frequencies to be applied during the water availability determination for new appropriations to allow for some potential future permitting. In response to this and other comments, the commission modified §298.380(a) to reduce the 10% allowable impairment, where possible, to 5% or 8% depending on the specific inflow regime and to clarify how the allowable impairment will be calculated and applied in water availability determinations for new water rights or amendments subject to this subchapter. Under SB 3's adaptive management provisions, further analyses and studies will be performed in the future to determine whether the adopted standards, once implemented, continue to protect the environment. The commission believes that the adopted rules are sufficiently protective of the environment because they include a flow regime consisting of subsistence flow, base flow, high flow pulses, and a freshwater inflow standard. The numerical values for the flow regime components are those recommended by the stakeholders.

§298.380(c), Environmental Flow Standards (Instream Flows)

GBRA commented that for three of the measurement points in the Guadalupe Basin (i.e., Guadalupe River at Gonzales, Guadalupe River at Cuero, and the Guadalupe River

at Victoria) the base flow criteria utilized are the base flows occurring in "wet" conditions, while other gages in the basin are based upon "average" conditions. They comment that the ED should not require these "wet" base flows, but rather the "dry" base flows for all gages in the Guadalupe River Basin as identified by the GSA BBEST, as the analyses performed during the stakeholder process demonstrate that if the flow at the applicable measurement point is above the subsistence flow standard but below the applicable "dry" base flow standard, and 50% of the difference between measured streamflow and the applicable subsistence flow is allowed to pass the measurement point, an adequate flow regime is produced that provides the magnitudes and variability in flows necessary for greater habitat quantity and quality.

The commission agrees that the 50% rule supports variability. However, using only dry base flow in the adopted standards would limit the range within which the remaining flows after diversion by a water right subject to this subchapter would be variable. The commission also responds that it reviewed the habitat information included in the science team and stakeholder reports, as well as the information provided in support of this comment. Based on its review, the commission believes its adopted rules would maintain habitat conditions in the Guadalupe River after diversions by water rights subject to this subchapter and are therefore protective of the environment. The rule was not changed in response to this comment.

GBRA and Victoria commented that the recommended summer pulse criteria for the three locations on the Guadalupe River would require a pulse that has previously occurred on the average once a summer to be provided twice per summer, should such pulses occur. These flow criteria are based on a long-term average, and the commenters are unaware of any science suggesting an environmental need for this additional level of protection in the summer at these three locations. The commenters stated that for the summer pulse requirements at these three measurement locations the ED should use the specific historically observed pulse magnitudes, volumes, and durations associated with the two-per season historical frequencies. GBRA commented that if the two-per-season summer pulse is not significantly greater than the selected seasonal base flow, TCEQ should exclude the summer pulse requirement. Victoria commented that it appears that using the once per season high flow pulse target for a two-per-season high flow pulse requirement does not substantially reduce the amount of water for water supply or substantially increase the amount of instream flow available for the environment, given application of the proposed 20% rule.

The commission respectfully disagrees because the frequencies referred to in the comment are derived from a HEFR-processed hydrographic separation. Review of historical gage records indicates that qualifying pulses, as determined in accordance with the proposed rule, did in fact

occur twice per season in some of the wetter periods. The commission notes that if one of these larger pulses occurs, a new water right permit would need to pass that pulse and if two of these pulses occur, a water right holder would need to pass two of these pulses. This would provide additional protection during wetter periods with little impact on water availability for future permits. The commission agrees that the stakeholders' recommended two-per-season pulse is not significantly greater than the seasonal base flow in the adopted rule but respectfully disagrees that this supports removing the summer pulse requirement. The commission reviewed whether adding a larger pulse requirement in the summer could provide additional freshwater inflows without large impacts on remaining unappropriated water and found that adding this larger pulse requirement did not significantly impact the remaining unappropriated water. The rule was not changed in response to this comment. However, at the August 8, 2012 commission agenda, the commission added an additional level of pulse flows to measurement points in the Guadalupe River Basin and increased the base flow values for measurement points in the Guadalupe River Basin described in §298.380(c)(1) - (5) and (7).

SARA commented that TCEQ has dramatically altered the GSA BBASC's recommendations without considering the guidance provided by the SAC, which was

created to provide scientific advice on the SB 3 process. The SAC recommended the same structure used in the SB 2 TIFP in order to maximize consistency in the framework of environmental flow recommendations in Texas. SARA recommended that TCEQ adhere to the scientific recommendations of the SAC and GSA BBEST and include multiple levels of base flow and high pulse flows in the standards or provide the scientific justification why such multiple levels of base and pulse flows are not necessary. The TCEQ refers to the single-tiered base flow and minimized high flow pulse structure as a "simplified structure." It is not evident in reviewing the intent of the SB 3 legislation that simplicity was a goal. As water management in Texas is not simple, why do the proposed rules reflect a "simplified structure" that is not supported by any of the most recent guidance or recommendations from noted scientists in the state and throughout the nation?

The commission did not disregard the science team recommendations, the SAC's review of those recommendations, or the stakeholder recommendations, but considered all of them. However, the commission respectfully disagrees that it had to adopt the stakeholder recommendations in their entirety because SB 3 clearly provides that the commission perform its own review of the stakeholders' recommendations. As provided in TWC, §11.02362(o), the stakeholders develop recommendations, not final environmental flow standards, and send their

recommendations to the commission. Under TWC, §11.1471, the commission is to adopt appropriate environmental flow standards "that are adequate to support a sound ecological environment, to the maximum extent reasonable considering other public interests and other relevant factors." The commission notes that it has adopted many of the stakeholders' recommendations.

The commission further responds that although the adopted rules do include a single base flow standard for some locations, flow variability would be maintained by only allowing water right permits subject to the adopted rules to divert 50% of the flow between subsistence and wet base flow. Therefore, once the standards are implemented in a water right permit, the remaining base flows after diversion would be variable.

Regarding the simplified structure, the commission responds the adopted standards are not based solely on scientific information. The SAC, in its discussion paper *Moving from Instream Flow Matrix Development to Environmental Flow Standard Recommendations* notes that recommendations for environmental flow requirements that replicate historical flow parameters could be considered as the maximum flows needed to support a sound ecological environment. The SAC further states that components of the overall flow matrix could perhaps be significantly

altered and still be protective of a sound ecological environment. The commission followed its instructions in TWC, §11.1471, by balancing human and other competing needs for water with the scientific recommendations.

Staff provided detailed information and explanations of the modeling, science, and balancing and also made this information available upon requests from interested parties. The commission also responds that the information used by the ED in performing his balancing analysis is available on the commission Web site. The rule was not changed in response to this comment.

SARA commented that the stakeholder recommendations included a typographical error for the Fall dry base flow for the San Antonio River at Goliad gage and that this error was carried forward into the proposed rule. The lowest tier base flow for the Fall currently states 367 however it should read 167.

The commission agrees and the rule has been modified to change this value.

SMRF commented that without specifically protecting the stakeholders' recommended pulses and base flows, the water permitting process is wide open for large dams that could capture the high pulses. It is not good enough to say, "there's no plans for a dam

right now."

The adopted rules include both base and pulse flows. The commission notes that the 2011 Region L Water Plan did not include any large on-channel water supply projects in the basin and bay systems covered by the adopted rules. The commission believes that the adopted rules are sufficiently protective of the environment because they include a flow regime consisting of subsistence flows, base flows, high flow pulses, and a freshwater inflow standard. Under SB 3's adaptive management provisions, further analyses and studies will be performed in the future to determine whether the adopted standards, once implemented, continue to protect the environment. The rule was not changed in response to this comment.

NWF and Sierra Club-Lone Star commented that the low levels of flow protection in proposed §298.380(c)(1) - (c)(9) for the Guadalupe River are not justified as being adequate to support a sound ecological environment or as being needed to avoid an unreasonable adverse impact on other public interests. Accordingly, the figures should be revised to include the components recommended by the stakeholders. As an additional basis for the recommended revisions, the commenters noted that the proposed rules appear to have substituted the pulse size of the summer one-per-season

pulse for the summer two-per-season pulse at three locations: Guadalupe River at Gonzales, Guadalupe River at Cuero, and Guadalupe River at Victoria. The larger pulse is still called for in the proposed rules with a frequency of twice per season. Although the substitution may have been intended to provide for an increased level of protection, it is far from clear that it would accomplish that goal. It actually is quite unlikely that the larger pulse would occur twice in any season. Historical statistics indicate that it would not. As a result, the intended protection likely would prove to be illusory because the smaller-sized pulses, which would be expected to occur twice per season, would not be protected and could be diverted. By contrast, the second of the larger-sized pulses which is "protected" under the proposed rule is unlikely to occur and so would not actually deliver any environmental benefit. For purposes of simplification, durations of one-per-year pulses and seasonal pulses have been limited to no more than 30 days, durations of one-per-two-year pulses have been limited to no more than 60 days, and durations of one-per-five-year pulses have been limited to no more than 90 days. The specific requested values are included in the comment.

The commission respectfully disagrees with the comment regarding the frequency at which the larger pulse would occur during the summer season. The frequencies referred to in the comment are derived from a HEFR-processed hydrographic separation. Review of historical gage records indicates that qualifying pulses, as determined in accordance with the

proposed rule, did occur twice per season, or more often, in some of the wetter periods. The commission notes that if one of these larger pulses occurs, a new water right permit would need to pass that pulse and if two of these pulses occur, a water right holder would need to pass two of these pulses. This would provide additional protection during wetter periods. The commission also notes that the stakeholders' recommended two-per-season pulse is not significantly greater than the seasonal base flow in the adopted rule and would likely provide limited additional protection. At the August 8, 2012 commission agenda, the commission added an additional level of pulse flows to measurement points in the Guadalupe River Basin and increased the base flow values for measurement points in the Guadalupe River Basin described in §298.380(c)(1) - (5) and (7).

The commission is not including pulses with frequencies greater than one-per-season in the adopted rule. The commission reviewed information from the science team, including the hydrographic separation which formed the basis for the science team's recommendations. In many instances, these large pulses appear to be comprised of one or more pulses connected by intervening periods of high base flows. This creates uncertainty regarding the calculation of these pulses because the identified pulses likely represent more than one pulse flow event. Further analyses

and studies may need to be performed in the future to determine appropriate magnitudes, volumes and durations of these larger pulse events. HB 3/SB 3 contemplate that these types of studies can be considered through adaptive management via the work plan for this basin and bay system. To the extent that additional information becomes available through monitoring and studies undertaken under the work plan, the science team could consider that information in future deliberations. The rule was not modified in response to this comment.

NWF and Sierra Club-Lone Star commented that the low levels of pulse flow protection in proposed §298.380(c)(10) - (16) are not justified as being adequate to support a sound ecological environment or as being needed to avoid an unreasonable adverse impact on other public interests. Accordingly, the referenced figures should be revised to include the stakeholders' recommendations. For purposes of simplification, durations of one-per-year pulses and seasonal pulses have been limited to no more than 30 days, durations of one-per-two-year pulses have been limited to no more than 60 days, and durations of one-per-five-year pulses have been limited to no more than 90 days.

The commission is not including pulses with frequencies greater than one-per-season in the adopted rule. The commission reviewed information

from the science team, including the hydrographic separation which formed the basis for the science team's recommendations. In many instances, these large pulses appear to be comprised of one or more pulses connected by intervening periods of high base flows. This creates uncertainty regarding the calculation of these pulses because the identified pulses likely represent more than one pulse flow event. Further analyses and studies may need to be performed in the future to determine appropriate magnitudes, volumes, and durations of these larger pulse events. HB 3/SB 3 contemplate that these types of studies can be considered through adaptive management via the work plan for this basin and bay system. To the extent that additional information becomes available through monitoring and studies undertaken under the work plan, the science team could consider that information in future deliberations. The rule was not modified in response to this comment.

Water Right Permit Conditions

NWF and Sierra Club-Lone Star commented that although it may often work out that "flow restriction special conditions" would be adequate to ensure compliance with the environmental flow standards, there is no need to constrain the commission's discretion in this manner. It simply is not possible now to predict precisely what types of permit applications the commission may be asked to consider in the future and the commission

should retain flexibility to protect the flow standards. For example, consider the case of a proposed permit that, because of flow restriction special conditions, would comply with instream flow requirements but would slightly impair an applicable freshwater inflow requirement. TCEQ should retain the flexibility to include some other type of permit condition, besides a flow restriction, that would be sufficient to address the impairment if using that other type of condition would be the most efficient way to proceed. Nothing in SB 3 purports to limit the types of permit conditions to be used in protecting environmental flows. TCEQ should not unduly limit its options in this respect. The commenters recommended that §298.385(a) - (b) be revised to remove the phrase, "flow restriction."

The commission responds that freshwater inflow standards are included in adopted §298.380(a). The provisions of adopted §298.380(a) would not allow a permit or amendment for a new appropriation of water to impair the freshwater inflow standards beyond the allowable impairment in the adopted rule. Adopted §298.380(a) includes provisions specifying how the freshwater inflow standards will be protected in the determination of water availability for a new application to store take or divert water. The adopted instream flow standards in Chapter 298 will be included in permits for new appropriations of water as special conditions. Special conditions that protect environmental flow standards would be those special conditions

that ensure compliance with the standards. The commission will implement these standards in each permit granted for a new appropriation of water. The commission also responds that applications for new appropriations of water currently receive flow restrictions based on their location and facts provided in the application. Similarly, an application for a new appropriation of water under these rules will receive streamflow restrictions as provided by the adopted rules. The rule was not changed in response to this comment.

SUBCHAPTER C: SABINE AND NECHES RIVERS, AND SABINE LAKE BAY

§298.290

Statutory Authority

The amended section is adopted under Texas Water Code (TWC), §5.102, concerning General Powers; TWC, §5.103, concerning Rules; and TWC, §5.105 concerning General Policy, which authorize the commission to adopt rules as necessary to carry out its power and duties under the TWC. The amended section is also adopted under TWC, TWC, §11.0235, concerning Policy Regarding Waters of the State; TWC, §11.02362(p) and (q) concerning Development of Environmental Flow Regime Recommendations; TWC, §11.147, concerning Effects of Permit on Bays and Estuaries and Instream Uses; and TWC, §11.1471, concerning Environmental Flow Standards and Set-Asides.

The adopted amended section implements TWC, §§11.0235, 11.0236(p) and (q), 11.147, and 11.1471.

§298.290. Schedule for Revision of Standards.

The adopted environmental flow standards or environmental flow set-asides for the Sabine and Neches Rivers, their associated tributaries, and Sabine Lake Bay may be revised by the commission through the rulemaking process. The Sabine and Neches basin and bay area stakeholder committee shall submit their review of the adopted

environmental flow standards by September 1, 2013, and every five years thereafter. If the stakeholder committee recommends revisions to the adopted environmental flow standards, or, if the commission determines that revisions to the adopted environmental flow standards are appropriate at the time of the periodic review, the rulemaking process shall be undertaken in conjunction with the periodic review. Any final revised rules arising from a rulemaking undertaken in conjunction with any such periodic review shall be effective within one year after the deadline for the review of the adopted environmental flow standards. The rulemaking process shall include participation by a balanced representation of stakeholders having interests in the Sabine and Neches Rivers, their associated tributaries, and Sabine Lake Bay.

**SUBCHAPTER D: COLORADO AND LAVACA RIVERS, AND MATAGORDA
AND LAVACA BAYS**

**§§298.300, 298.305, 298.310, 298.315, 298.320, 298.325, 298.330, 298.335,
298.340**

Statutory Authority

The new sections are adopted under Texas Water Code (TWC), §5.102, concerning General Powers; TWC, §5.103, concerning Rules; and TWC, §5.105 concerning General Policy, which authorize the commission to adopt rules as necessary to carry out its power and duties under the TWC. The new sections are also adopted under TWC, §11.0235, concerning Policy Regarding Waters of the State; TWC, §11.147, concerning Effects of Permit on Bays and Estuaries and Instream Uses; and TWC, §11.1471, concerning Environmental Flow Standards and Set-Asides.

The adopted new sections implement TWC, §§11.0235, 11.147, and 11.1471.

§298.300. Applicability and Purpose.

This subchapter contains the environmental flow standards for the Colorado and Lavaca Rivers, and Matagorda and Lavaca Bays. The provisions of this subchapter have control over any provisions of Subchapter A of this chapter (relating to General

Provisions) that are inconsistent with this subchapter relating to environmental flow standards and regulation in the Colorado and Lavaca Rivers, and Matagorda and Lavaca Bays.

§298.305. Definitions.

The following words or phrases have the following meanings in this subchapter unless the context clearly indicates otherwise:

(1) Annual average inflow--the long-term average annual volume of freshwater inflows at the most downstream point in the Colorado River Basin.

(2) Annual strategy frequency--the frequencies at which specific levels of freshwater inflows occur and which are used for the sole purpose of providing additional freshwater inflows to Matagorda and Lavaca Bays through voluntary strategies.

(3) Average condition--for all measurement points, the hydrologic condition that would occur approximately 50% of the time.

(4) Dry condition--for all measurement points except those measurement points on the Colorado River below Lake Travis, the hydrologic condition that would occur approximately 20% of the time and represents periods when conditions are dry but not severe. For all measurement points on the Colorado River below Lake Travis, the hydrologic condition that would occur approximately 45% of the time and that is intended to represent periods when conditions are drier than average conditions but not severe.

(5) Fall--for the measurement points on the Colorado River and its tributaries above Lake Travis, the period of time September through October, inclusive, and for all other measurement points, the period of time September through November, inclusive.

(6) Fall inflow quantity--during any individual calendar year, the maximum freshwater inflow quantity, at the most downstream point in the Lavaca River Basin and at the most downstream point on Garcitas Creek in the Lavaca-Guadalupe Coastal Basin, occurring during any period of three consecutive months beginning in the months of August, September, or October.

(7) Fall season quantity--the maximum freshwater inflow quantity, at the most downstream point in the Colorado River Basin, occurring during any three consecutive months during the period from August through December, inclusive.

(8) Intervening inflow quantity--the quantity of freshwater inflows, at the most downstream point in the Lavaca River Basin and at the most downstream point on Garcitas Creek in the Lavaca-Guadalupe Coastal Basin, occurring during the remaining six months of the calendar year, that were not included in the Fall Inflow or Spring Inflow for that calendar year.

(9) Intervening season quantity--the quantity of freshwater inflows, at the most downstream point in the Colorado River Basin, occurring during the six months of the calendar year that are not counted towards the fall season quantity or the spring season quantity for that year.

(10) Inflow regime level--one of the annual freshwater inflow patterns, at the most downstream point in the Colorado River Basin for Matagorda Bay, that includes a spring season quantity, a fall season quantity, and an intervening season quantity as described in Figure: 30 TAC §298.330(a)(2) of this title (relating to Environmental Flow Standards), or at the most downstream point in the Lavaca River Basin and the most downstream point on Garcitas Creek in the Lavaca-Guadalupe

Coastal Basin for Lavaca Bay, that includes a spring inflow quantity, a fall inflow quantity, and an intervening inflow quantity as described in Figure 30: TAC §298.330(c) of this title.

(11) Long-Term annual strategy quantity--the annual average volume of freshwater inflows, which is used for the sole purpose of providing additional freshwater inflows to Matagorda Bay through voluntary strategies.

(12) Modeled annual frequency--the frequency at which specific levels of freshwater inflows occur in the commission's water availability models for the Colorado and Lavaca river basins and the Colorado-Lavaca and Lavaca-Guadalupe coastal basins at the time the first water right application subject to this subchapter is processed.

(13) Monthly threshold inflow--the total volume of freshwater inflows, at the most downstream point in the Colorado River Basin, in any calendar month.

(14) Severe condition--for all measurement points, the hydrologic condition that would occur approximately 5% of the time and that is intended to represent the driest periods.

(15) Spring--the period of time March through June, inclusive.

(16) Spring inflow quantity--during any individual calendar year, the maximum freshwater inflow quantity, at the most downstream point in the Lavaca River Basin and at the most downstream point on Garcitas Creek in the Lavaca-Guadalupe Coastal Basin, occurring during any period of three consecutive months beginning in the months of February, March, April, or May.

(17) Spring season quantity--during any individual calendar year, the maximum freshwater inflow quantity, at the most downstream point in the Colorado River Basin, occurring during any three consecutive months during the period from January through July, inclusive.

(18) Sound ecological environment--characterized by flow regimes that support existing biological communities in rivers, riparian, bay, and estuary habitats.

(19) Summer--the period of time July through August, inclusive.

(20) Wet condition--for all measurement points except those measurement points on the Colorado River below Lake Travis, the hydrologic condition that would occur approximately 25% of the time and that is intended to represent the wettest conditions.

(21) Winter--for the measurement points on the Colorado River above Lake Travis, the period of time November through February, inclusive, and for all other measurement points, the period of time December through February, inclusive.

§298.310. Findings.

(a) The Colorado and Lavaca Rivers and their associated tributaries and Matagorda and Lavaca Bays and their associated estuaries are healthy and sound ecological environments.

(b) For the Colorado and Lavaca Rivers, and their associated tributaries, the commission finds that these sound ecological environments can best be maintained by a set of flow standards that implement a schedule of flow quantities that contain subsistence flow, base flow, and high flow pulses at defined measurement points. Minimum flow levels for these components will vary by season and by year since the amount of precipitation and, therefore, whether a system is in subsistence or base flow conditions, will vary from year to year and within a year from season to season, and the number of pulses protected will also vary with the amount of precipitation.

(c) For Matagorda and Lavaca Bays, the commission finds that the sound

ecological environment of Matagorda and Lavaca Bays can best be maintained by a set of freshwater inflow standards that include variable freshwater inflow quantities and that incorporate inflow and frequency targets at which specific levels of freshwater inflows occur, which are used for the sole purpose of providing additional freshwater inflows to Matagorda and Lavaca Bays through voluntary strategies.

(d) For East Matagorda Bay, the commission does not adopt environmental flow standards but finds that the sound ecological environment of East Matagorda Bay can be maintained by avoiding further reduction of freshwater inflows, to the extent those reductions can be avoided, and that strategies to provide additional freshwater inflows to East Matagorda Bay should be pursued.

§298.315. Set-Asides and Standards Priority Date.

The priority date for the environmental flow standards and set-asides established by this subchapter is March 1, 2011. The priority date for the environmental flow standards will be used in the water availability determination for a new appropriation or for an amendment to an existing water right that increases the amount of water authorized to be stored, taken, or diverted, and has no other purpose.

§298.320. Calculation of Hydrologic Conditions.

(a) For new water right authorizations which increase the amount of water authorized to be stored, taken, or diverted as described in §298.10 of this title (relating to Applicability), the determination of the hydrologic condition for a particular season shall be determined once per season. The conditions present on the last day of the month of the preceding season will determine the hydrologic condition for the following season. For each measurement point specified in this section, either cumulative streamflow for the previous 12 months, combined storage in major reservoirs, or reservoir elevation will determine the hydrologic condition, as described in subsections (b) - (d) of this section.

(b) For measurement points located on the Colorado River above Lake Travis and tributaries of the Colorado River, and in the Colorado-Lavaca and the Lavaca-Guadalupe Coastal Basins, cumulative streamflow for the preceding 12 months and the corresponding hydrologic conditions are:

Figure: 30 TAC §298.320(b)

Cumulative Streamflow for Calculating Hydrologic Conditions for Measurement Points on the Colorado River above Lake Travis and tributaries of the Colorado River, and in the Colorado-Lavaca and the Lavaca-Guadalupe Coastal Basins

BASIN	MEASUREMENT POINT	Cumulative Streamflow (acre-feet)			
		SEVERE	DRY	AVERAGE	WET

COLORADO	Colorado River above Silver	less than 4,090	4,090 - 16,600	16,600 - 57,490	greater than 57,490
COLORADO	Colorado River near Ballinger	less than 3,120	3,120 - 11,150	11,150 - 67,700	greater than 67,700
COLORADO	Elm Creek at Ballinger	less than 820	820 - 4,990	4,990 - 46,560	greater than 46,560
COLORADO	South Concho River at Christoval	less than 5,270	5,270 - 7,380	7,380 - 21,660	greater than 21,660
COLORADO	Concho River at Paint Rock	less than 7,110	7,110 - 17,000	17,000 - 49,900	greater than 49,900
COLORADO	Pecan Bayou near Mullin	less than 11,860	11,860 - 26,700	26,700 - 187,740	greater than 187,740
COLORADO	San Saba River at San Saba	less than 40,550	40,550 - 61,100	61,100 - 149,890	greater than 149,890
COLORADO	Colorado River near San Saba	less than 80,510	80,510 - 205,110	205,110 - 568,970	greater than 568,970
COLORADO	Llano River at Llano	less than 90,810	90,810 - 145,660	145,660 - 364,540	greater than 364,540
COLORADO	Pedernales River near Johnson City	less than 27,710	27,710 - 70,210	70,210 - 222,700	greater than 222,700

COLORADO	Onion Creek near Driftwood	less than 810	810 - 10,460	10,460 - 59,610	greater than 59,610
COLORADO-LAVACA	Tres Palacios Creek near Midfield	less than 31,940	31,940 - 62,920	62,920 - 158,630	greater than 158,630
LAVACA-GUADALUPE	Garcitas Creek near Inez	less than 1,880	1,880 - 10,790	10,790 - 62,460	greater than 62,460

(c) For measurement points located on the Colorado River below Lake Travis, the combined reservoir storage in Lakes Travis and Buchanan and the corresponding hydrologic conditions are:

Figure: 30 TAC §298.320(c)

Combined Reservoir Storage for Calculating Hydrologic Conditions for Measurement Points on the Colorado River below Lake Travis

BASIN	MEASUREMENT POINTS	Combined Reservoir Storage in Lakes Travis and Buchanan (acre-feet)		
		SEVERE	DRY	AVERAGE
COLORADO	Colorado River at Bastrop, Colorado River at Columbus, Colorado River at Wharton	less than 1,103,700	1,103,700 - 1,737,460	greater than 1,737,460

(d) For measurement points located in the Lavaca River Basin, the reservoir elevation of Lake Texana and the corresponding hydrologic conditions are:

Figure: 30 TAC §298.320(d)

Reservoir Elevation for Calculating Hydrologic Conditions for Measurement Points in the Lavaca River Basin

BASIN	MEASUREMENT POINTS	Reservoir Elevation of Lake Texana (msl)			
		SEVERE	DRY	AVERAGE	WET
LAVACA	West Mustang Creek near Ganado, East Mustang Creek near Louise, Navidad River near Edna, Sandy Creek near Ganado, Lavaca River near Edna	less than 39.95	39.95 - 43.00	43.00 - 44.00	greater than 44.00

msl = mean sea level

(e) For purposes of water availability determinations, for measurement points on the Colorado River above Lake Travis and tributaries of the Colorado River, and in the Lavaca River Basin and the Colorado-Lavaca and Lavaca-Guadalupe Coastal Basins, hydrologic conditions used in the commission's water availability models shall be calculated such that severe conditions occur approximately 5% of the time, dry conditions occur approximately 20% of the time, average conditions occur approximately 50% of the time, and wet conditions occur approximately 25% of the time.

(f) For purposes of water availability determinations, for measurement points on the Colorado River below Lake Travis, hydrologic conditions used in the commission's

water availability models shall be calculated such that severe conditions occur approximately 5% of the time, dry conditions occur approximately 45% of the time, and average conditions occur approximately 50% of the time.

(g) The hydrologic condition indicators set out in subsections (b) - (d) of this section govern the operations of permits subject to this subchapter during the initial period, of not longer than ten years, until the environmental flow standards in this subchapter are reevaluated. Those indicators were calculated to achieve compliance with the percentages of time stated in subsections (e) and (f) of this section. The hydrologic condition indicators set out in subsections (b) - (d) of this section will be recalculated, no less frequently than once every ten years, in order to achieve, to the greatest extent possible, compliance with the percentages of time stated in subsections (e) and (f) of this section.

§298.325. Schedule of Flow Quantities.

(a) Schedule of flow quantities. The environmental flow standards adopted by this subchapter constitute a schedule of flow quantities made up of subsistence flow, base flow, and high flow pulses. Environmental flow standards are established at 21 separate measurement locations in §298.330 of this title (relating to Environmental Flow Standards).

(b) Subsistence flow. The applicable subsistence flow standard varies depending on the seasons as described in §298.305 of this title (relating to Definitions). For a water right holder to which an environmental flow standard applies, at a measurement point that applies to the water right, the water right holder may not store or divert water under severe hydrologic conditions, unless the flow at the measurement point is above the applicable subsistence flow standard for that point. During severe hydrologic conditions, if the flow at the measurement point is above the subsistence flow standard but below the applicable dry condition base flow standard, then the water right holder may divert or store water according to its permit, subject to senior and superior water rights, as long as the flow at the measurement point does not fall below the applicable subsistence flow standard.

(c) Base flow. The applicable base flow level varies depending on the seasons as described in §298.305 of this title and the hydrologic condition described in §298.320 of this title (relating to Calculation of Hydrologic Conditions). For a water right holder to which an environmental flow standard applies, at a measurement point that applies to the water right, the water right holder is subject to the base flow standard for the hydrologic condition prevailing at that time. For all measurement points except those on the Colorado River below Lake Travis, the water right will be subject to one of the following: a dry, an average, or a wet base flow standard. For all measurement points on

the Colorado River below Lake Travis, the water right will be subject to either a dry or an average base flow standard. For all measurement points, the dry base flow standard applies during severe hydrologic conditions. For a water right holder to which an environmental flow standard applies, at a measurement point that applies to the water right, when the flow at the applicable measurement point is above the applicable base flow standard, but below any applicable high flow pulse levels, the water right holder may store or divert water according to its permit, subject to senior and superior water rights, as long as the flow at the applicable measurement point does not fall below the applicable base flow standard for that hydrologic condition.

(d) High flow pulses. High flow pulses are relatively short-duration, high flows within the watercourse that occur during or immediately following a storm event.

(1) For measurement points on the Colorado River below Lake Travis, two pulses per season, one pulse per 18 months, and one pulse per two years are to be passed (i.e., no storage or diversion by an applicable water right holder), if applicable, and as described in §298.330 of this title, if streamflows are above the applicable subsistence or base flow standard, and if the applicable high flow pulse trigger level is met at the applicable measurement point. The water right holder shall not divert or store water until the daily average flow at the applicable measurement point equals at least the high flow pulse trigger level on consecutive days equaling the duration time except during

times that streamflow at the applicable measurement point exceeds the applicable high flow pulse trigger level.

(2) For measurement points on the Colorado River above Lake Travis, tributaries of the Colorado River, and in the Lavaca River Basin and the Colorado-Lavaca and Lavaca-Guadalupe Coastal Basins, one or two pulses per season and one pulse per year are to be passed (i.e., no storage or diversion by an applicable water right holder), if applicable, and as described in §298.330 of this title, if streamflows are above the applicable subsistence or base flow standard, and if the applicable high flow pulse trigger level is met at the applicable measurement point. The water right holder shall not divert or store water until either the applicable volume amount has passed the applicable measurement point or the duration time has passed since the high flow pulse trigger level occurred except during times that streamflow at the applicable measurement point exceeds the applicable high flow pulse trigger level.

(3) If the applicable high flow pulse trigger level does not occur in a season, then the water right holder need not stop storing or diverting water to produce a high flow pulse. The water right holder is not required to release water lawfully stored to produce a high flow pulse.

(4) Each season is independent of the preceding and subsequent seasons with respect to high flow pulse frequency.

(5) High flow pulses are independent of the hydrologic conditions set out in §298.320 of this title.

(6) If a high flow pulse requirement for a one-per-season pulse is satisfied for a particular season, one of the two-per-season pulse requirements is also considered to be satisfied. When a pulse flow requirement for an annual pulse is satisfied in a particular season, the one-per-season pulse requirement and one of the two-per-season pulse requirements are also considered to be satisfied.

(e) Stored water. A water right owner that has stored water in accordance with the terms and conditions of its water right, including any applicable environmental flow requirement in effect at the time the water was stored, may divert, release, or use this water, even if the applicable environmental flow requirement is not met at the time of the subsequent diversion, release, or use of that stored water.

§298.330. Environmental Flow Standards.

(a) A water right application in the Colorado River Basin which increases the

amount of water authorized to be stored, taken or diverted as described in §298.10 of this title (relating to Applicability) shall not cause or contribute to an impairment of the inflow regimes as described in the figure in this subsection. Impairment of the inflow regime shall be evaluated as part of the water availability determination for a new water right or amendment that is subject to this subchapter. For purposes of this subsection, impairment would occur if the application, when considered in combination with any authorizations subject to this subchapter, which were issued prior to this application, would:

(1) decrease the annual average freshwater inflow, at the most downstream point in the Colorado River Basin, below 60% of the long-term annual strategy quantity listed in Figure: 30 TAC §298.330(a)(2);

(2) decrease the modeled annual frequency of any inflow regime; or,

Figure: 30 TAC §298.330(a)(2)

Bay and Estuary Freshwater Inflow Standards for Matagorda Bay Inflows from the Colorado River Basin

Inflow Regime	Monthly Minimum Quantity (af)	Spring Season Quantity (af)	Fall Season Quantity (af)	Intervening Season Quantity (af)	Long-Term Annual Strategy Quantity (af)	Annual Strategy Frequency
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Monthly Threshold Inflow	15,000	N/A	N/A	N/A	N/A	100%
Level 1	N/A	114,000	81,000	105,000	N/A	90%
Level 2	N/A	168,700	119,900	155,400	N/A	75%
Level 3	N/A	246,200	175,000	226,800	N/A	60%
Level 4	N/A	433,200	307,800	399,000	N/A	35%
Annual Average	N/A	N/A	N/A	N/A	1,400,000	N/A

af = acre-feet
 N/A = not applicable

(3) decrease the monthly inflow quantity to Matagorda Bay below 15,000 acre-feet per month.

(b) To the extent that strategies are implemented through a water right permit or amendment to help meet the freshwater inflow standards for Matagorda Bay, a water right application in the Colorado River Basin which increases the amount of water authorized to be stored, taken, or diverted as described in §298.10 of this title shall not reduce the long-term annual strategy quantity, the modeled annual frequency, or the monthly threshold inflow for any inflow regime level listed in Figure: 30 TAC §298.330(a)(2) below the long term annual strategy quantity, modeled annual frequency, or the monthly threshold inflow that would occur in the commission's water availability model with the permitted strategy or strategies in place.

(c) A water right application in the Lavaca River basin, or Garcitas Creek located

in the Lavaca-Guadalupe Coastal Basin, which increases the amount of water authorized to be stored, taken or diverted as described in §298.10 of this title, shall not cause or contribute to an impairment of the inflow regimes as described in the figure in this subsection. Impairment of the inflow regime shall be evaluated as part of the water availability determination for a new water right or amendment that is subject to this subchapter. For purposes of this subsection, impairment would occur if the application, when considered in combination with any prior authorizations subject to this subchapter, would decrease the modeled annual frequency of any inflow regime level.

Figure: 30 TAC §298.330(c)

Bay and Estuary Freshwater Inflow Standards for the Lavaca Bay System

Inflow Regime	Spring Inflow Quantity (af)	Fall Inflow Quantity (af)	Intervening Inflow Quantity (af)	Annual Strategy Frequency
Subsistence	13,500	9,600	6,900	96%
Base Dry	55,080	39,168	28,152	82%
Base Average	127,980	91,080	65,412	46%
Base Wet	223,650	158,976	114,264	28%

af=acre feet

(d) To the extent that strategies are implemented through a water right permit or amendment to help meet the freshwater inflow standards for Lavaca Bay, a water right application in the Lavaca River Basin, or on Garcitas Creek in the Lavaca-Guadalupe Coastal Basin, which increases the amount of water authorized to be stored, taken, or

diverted as described in §298.10 of this title, shall not reduce the modeled annual frequency in the commission's water availability model for any inflow regime level described in Figure: 30 TAC §298.330(c) below the frequency that would occur with the permitted strategy or strategies in place.

(e) The following environmental flow standards are established for the following described measurement points:

(1) Colorado River above Silver, Texas, generally described as United States Geological Survey (USGS) gage 08123850, and more specifically described as Latitude 32 degrees, 03 minutes, 13 seconds; Longitude 100 degrees, 45 minutes, 42 seconds.

Figure: 30 TAC §298.330(e)(1)

United States Geological Survey Gage 08123850, Colorado River above Silver

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)	Annual Pulse
Winter	Severe	1 cfs	2 cfs	Trigger: 18 cfs Volume: 120 af Duration: 13 days	Trigger: 42 cfs Volume: 300 af Duration: 15 days	Trigger: 3,000 cfs Volume: 13,600 af Duration: 17 days
Winter	Dry	N/A	2 cfs			
Winter	Average	N/A	4 cfs			
Winter	Wet	N/A	7 cfs			

Spring	Severe	1 cfs	2 cfs	Trigger: 600 cfs Volume: 2,500 af Duration: 9 days	Trigger: 1,800 cfs Volume: 7,900 af Duration: 11 days
Spring	Dry	N/A	2 cfs		
Spring	Average	N/A	5 cfs		
Spring	Wet	N/A	12 cfs		
Summer	Severe	1 cfs	1 cfs	Trigger: 100 cfs Volume: 350 af Duration: 6 days	Trigger: 330 cfs Volume: 1,400 af Duration: 9 days
Summer	Dry	N/A	1 cfs		
Summer	Average	N/A	3 cfs		
Summer	Wet	N/A	8 cfs		
Fall	Severe	1 cfs	1 cfs	Trigger: 100 cfs Volume: 400 af Duration: 6 days	Trigger: 430 cfs Volume: 1,800 af Duration: 9 days
Fall	Dry	N/A	1 cfs		
Fall	Average	N/A	4 cfs		
Fall	Wet	N/A	10 cfs		

cfs = cubic feet per second
 af = acre-feet
 N/A = not applicable

(2) Colorado River near Ballinger, Texas, generally described as USGS gage 08126380, and more specifically described as Latitude 31 degrees, 42 minutes, 55 seconds; Longitude 100 degrees, 01 minutes, 34 seconds.

Figure: 30 TAC §298.330(e)(2)

United States Geological Survey Gage 08126380, Colorado River near Ballinger

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)	Annual Pulse
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Winter	Severe	1 cfs	4 cfs	Trigger: 27 cfs Volume: 180 af Duration: 11 days	Trigger: 96 cfs Volume: 660 af Duration: 17 days	Trigger: 3,200 cfs Volume: 13,700 af Duration: 10 days
Winter	Dry	N/A	4 cfs			
Winter	Average	N/A	9 cfs			
Winter	Wet	N/A	14 cfs			
Spring	Severe	1 cfs	3 cfs	Trigger: 1,300 cfs Volume: 5,300 af Duration: 9 days	Trigger: 3,200 cfs Volume: 13,700 af Duration: 10 days	
Spring	Dry	N/A	3 cfs			
Spring	Average	N/A	9 cfs			
Spring	Wet	N/A	19 cfs			
Summer	Severe	1 cfs	2 cfs	Trigger: 130 cfs Volume: 490 af Duration: 6 days	Trigger: 630 cfs Volume: 2,600 af Duration: 9 days	
Summer	Dry	N/A	2 cfs			
Summer	Average	N/A	6 cfs			
Summer	Wet	N/A	14 cfs			
Fall	Severe	1 cfs	4 cfs	Trigger: 250 cfs Volume: 950 af Duration: 8 days	Trigger: 1,500 cfs Volume: 5,700 af Duration: 10 days	
Fall	Dry	N/A	4 cfs			
Fall	Average	N/A	9 cfs			
Fall	Wet	N/A	17 cfs			

cfs = cubic feet per second

af = acre-feet

N/A = not applicable

(3) Colorado River near San Saba, Texas, generally described as USGS gage 08147000, and more specifically described as Latitude 31 degrees, 13 minutes, 04 seconds; Longitude 98 degrees, 33 minutes, 51 seconds.

Figure: 30 TAC §298.330(e)(3)

United States Geological Survey Gage 08147000, Colorado River near San Saba

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)	Annual Pulse
Winter	Severe	50 cfs	95 cfs	Trigger: 520 cfs Volume: 3,100 af Duration: 9 days	Trigger: 1,600 cfs Volume: 11,100 af Duration: 15 days	Trigger: 18,900 cfs Volume: 129,100 af Duration: 23 days
Winter	Dry	N/A	95 cfs			
Winter	Average	N/A	150 cfs			
Winter	Wet	N/A	210 cfs			
Spring	Severe	50 cfs	120 cfs	Trigger: 5,800 cfs Volume: 31,300 af Duration: 9 days	Trigger: 11,000 cfs Volume: 70,200 af Duration: 13 days	
Spring	Dry	N/A	120 cfs			
Spring	Average	N/A	190 cfs			
Spring	Wet	N/A	360 cfs			
Summer	Severe	30 cfs	72 cfs	Trigger: 510 cfs Volume: 1,900 af Duration: 4 days	Trigger: 1,400 cfs Volume: 6,500 af Duration: 7 days	
Summer	Dry	N/A	72 cfs			
Summer	Average	N/A	120 cfs			
Summer	Wet	N/A	210 cfs			
Fall	Severe	30 cfs	95 cfs	Trigger: 890 cfs Volume: 3,500 af Duration: 6 days	Trigger: 3,800 cfs Volume: 19,200 af Duration: 12 days	
Fall	Dry	N/A	95 cfs			
Fall	Average	N/A	150 cfs			
Fall	Wet	N/A	210 cfs			

cfs = cubic feet per second
 af = acre-feet
 N/A = not applicable

(4) Elm Creek at Ballinger, Texas, generally described as USGS gage 08127000, and more specifically described as Latitude 31 degrees, 44 minutes, 57 seconds; Longitude 99 degrees, 56 minutes, 51 seconds.

Figure: 30 TAC §298.330(e)(4)

United States Geological Survey Gage 08127000, Elm Creek at Ballinger

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)	Annual Pulse
Winter	Severe	1 cfs	1 cfs	Trigger: 10 cfs Volume: 71 af Duration: 10 days	Trigger: 40 cfs Volume: 270 af Duration: 1 day	Trigger: 1,900 cfs Volume: 7,200 af Duration: 18 days
Winter	Dry	N/A	1 cfs			
Winter	Average	N/A	1 cfs			
Winter	Wet	N/A	4 cfs			
Spring	Severe	1 cfs	1 cfs	Trigger: 380 cfs Volume: 1,400 af Duration: 10 days	Trigger: 1,000 cfs Volume: 3,800 af Duration: 12 days	
Spring	Dry	N/A	1 cfs			
Spring	Average	N/A	1 cfs			
Spring	Wet	N/A	5 cfs			
Summer	Severe	1 cfs	1 cfs	Trigger: 6 cfs Volume: 25 af Duration: 6 days	Trigger: 74 cfs Volume: 300 af Duration: 9 days	
Summer	Dry	N/A	1 cfs			
Summer	Average	N/A	1 cfs			
Summer	Wet	N/A	1 cfs			
Fall	Severe	1 cfs	1 cfs	Trigger: 10 cfs Volume: 46 af Duration: 9 days	Trigger: 190 cfs Volume: 850 af Duration: 15 days	
Fall	Dry	N/A	1 cfs			
Fall	Average	N/A	1 cfs			
Fall	Wet	N/A	1 cfs			

cfs = cubic feet per second

af = acre-feet

N/A = not applicable

(5) Concho River at Paint Rock, Texas, generally described as USGS gage 08136500, and more specifically described as Latitude 31 degrees, 30 minutes, 57 seconds; Longitude 99 degrees, 55 minutes, 09 seconds.

Figure: 30 TAC §298.330(e)(5)

United States Geological Survey Gage 08136500, Concho River at Paint Rock

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)	Annual Pulse
Winter	Severe	1 cfs	8 cfs	Trigger: 61 cfs Volume: 400 af Duration: 10 days	Trigger: 160 cfs Volume: 1,200 af Duration: 16 days	Trigger: 3,000 cfs Volume: 13,500 af Duration: 19 days
Winter	Dry	N/A	8 cfs			
Winter	Average	N/A	20 cfs			
Winter	Wet	N/A	36 cfs			
Spring	Severe	1 cfs	4 cfs	Trigger: 500 cfs Volume: 2,000 af Duration: 8 days	Trigger: 1,400 cfs Volume: 5,700 af Duration: 11 days	
Spring	Dry	N/A	4 cfs			
Spring	Average	N/A	14 cfs			
Spring	Wet	N/A	27 cfs			
Summer	Severe	1 cfs	1 cfs	Trigger: 32 cfs Volume: 140 af Duration: 6 days	Trigger: 110 cfs Volume: 520 af Duration: 8 days	
Summer	Dry	N/A	1 cfs			
Summer	Average	N/A	4 cfs			
Summer	Wet	N/A	12 cfs			
Fall	Severe	1 cfs	5 cfs	Trigger: 74 cfs Volume: 330 af Duration: 7 days	Trigger: 300 cfs Volume: 1,300 af Duration: 10 days	
Fall	Dry	N/A	5 cfs			
Fall	Average	N/A	16 cfs			
Fall	Wet	N/A	29 cfs			

cfs = cubic feet per second
 af = acre-feet
 N/A = not applicable

(6) South Concho River at Christoval, Texas, generally described as USGS gage 08128000, and more specifically described as Latitude 31 degrees, 11 minutes, 13 seconds; Longitude 100 degrees, 30 minutes, 06 seconds.

Figure: 30 TAC §298.330(e)(6)

United States Geological Survey Gage 08128000, South Concho River at Christoval

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)	Annual Pulse
Winter	Severe	2 cfs	9 cfs	N/A	N/A	Trigger: 420 cfs Volume: 1,400 af Duration: 9 days
Winter	Dry	N/A	9 cfs			
Winter	Average	N/A	15 cfs			
Winter	Wet	N/A	22 cfs			
Spring	Severe	3 cfs	9 cfs	N/A	N/A	
Spring	Dry	N/A	9 cfs			
Spring	Average	N/A	15 cfs			
Spring	Wet	N/A	22 cfs			
Summer	Severe	2 cfs	7 cfs	N/A	N/A	
Summer	Dry	N/A	7 cfs			
Summer	Average	N/A	12 cfs			
Summer	Wet	N/A	22 cfs			

Fall	Severe	2 cfs	7 cfs	N/A	Trigger: 45 cfs Volume: 190 af Duration: 7 days	
Fall	Dry	N/A	7 cfs			
Fall	Average	N/A	12 cfs			
Fall	Wet	N/A	22 cfs			

cfs = cubic feet per second
 af = acre-feet
 N/A = not applicable

(7) Pecan Bayou near Mullin, Texas, generally described as USGS gage 08143600, and more specifically described as Latitude 31 degrees, 31 minutes, 02 seconds; Longitude 98 degrees, 44 minutes, 25 seconds.

Figure: 30 TAC §298.330(e)(7)

United States Geological Survey Gage 08143600, Pecan Bayou near Mullin

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)	Annual Pulse
Winter	Severe	1 cfs	3 cfs	Trigger: 52 cfs Volume: 230 af Duration: 7 days	Trigger: 250 cfs Volume: 1,500 af Duration: 14 days	Trigger: 3,500 cfs Volume: 25,800 af Duration: 26 days
Winter	Dry	N/A	3 cfs			
Winter	Average	N/A	7 cfs			
Winter	Wet	N/A	12 cfs			
Spring	Severe	1 cfs	3 cfs	Trigger: 710 cfs Volume: 3,600 af Duration: 10 days	Trigger: 2,100 cfs Volume: 13,200 af Duration: 17 days	
Spring	Dry	N/A	3 cfs			
Spring	Average	N/A	9 cfs			
Spring	Wet	N/A	19 cfs			

Summer	Severe	1 cfs	2 cfs	Trigger: 21 cfs Volume: 73 af Duration: 4 days	Trigger: 100 cfs Volume: 440 af Duration: 7 days
Summer	Dry	N/A	2 cfs		
Summer	Average	N/A	4 cfs		
Summer	Wet	N/A	8 cfs		
Fall	Severe	1 cfs	3 cfs	Trigger: 36 cfs Volume: 110 af Duration: 3 days	Trigger: 250 cfs Volume: 1,200 af Duration: 9 days
Fall	Dry	N/A	3 cfs		
Fall	Average	N/A	7 cfs		
Fall	Wet	N/A	12 cfs		

cfs = cubic feet per second
 af = acre-feet
 N/A = not applicable

(8) San Saba River at San Saba, Texas, generally described as USGS gage 08146000, and more specifically described as Latitude 31 degrees, 12 minutes, 47 seconds; Longitude 98 degrees, 43 minutes, 09 seconds.

Figure: 30 TAC §298.330(e)(8)

United States Geological Survey Gage 08146000, San Saba River at San Saba

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)	Annual Pulse
Winter	Severe	29 cfs	56 cfs	Trigger: 150 cfs Volume: 980 af Duration: 14 days	Trigger: 330 cfs Volume: 2,300 af Duration: 18 days	Trigger: 5,500 cfs Volume: 27,400 af Duration: 21 days
Winter	Dry	N/A	56 cfs			
Winter	Average	N/A	81 cfs			
Winter	Wet	N/A	110 cfs			

Spring	Severe	22 cfs	56 cfs	Trigger: 810 cfs Volume: 3,600 af Duration: 9 days	Trigger: 2,000 cfs Volume: 9,200 af Duration: 12 days
Spring	Dry	N/A	56 cfs		
Spring	Average	N/A	81 cfs		
Spring	Wet	N/A	110 cfs		
Summer	Severe	3 cfs	32 cfs	N/A	Trigger: 210 cfs Volume: 1,100 af Duration: 9 days
Summer	Dry	N/A	32 cfs		
Summer	Average	N/A	46 cfs		
Summer	Wet	N/A	62 cfs		
Fall	Severe	13 cfs	40 cfs	Trigger: 150 cfs Volume: 600 af Duration: 8 days	Trigger: 500 cfs Volume: 2,300 af Duration: 12 days
Fall	Dry	N/A	40 cfs		
Fall	Average	N/A	64 cfs		
Fall	Wet	N/A	87 cfs		

cfs = cubic feet per second
 af = acre-feet
 N/A = not applicable

(9) Llano River at Llano, Texas, generally described as USGS gage 08151500, and more specifically described as Latitude 30 degrees, 45 minutes, 04 seconds; Longitude 98 degrees, 40 minutes, 10 seconds.

Figure: 30 TAC §298.330(e)(9)

United States Geological Survey Gage 08151500, Llano River at Llano

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)	Annual Pulse
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Winter	Severe	44 cfs	100 cfs	Trigger: 390 cfs Volume: 2,500 af Duration: 13 days	Trigger: 1,100 cfs Volume: 6,800 af Duration: 16 days	Trigger: 9,100 cfs Volume: 46,100 af Duration: 18 days
Winter	Dry	N/A	100 cfs			
Winter	Average	N/A	150 cfs			
Winter	Wet	N/A	190 cfs			
Spring	Severe	35 cfs	100 cfs	Trigger: 1,800 cfs Volume: 8,500 af Duration: 10 days	Trigger: 4,800 cfs Volume: 23,200 af Duration: 13 days	
Spring	Dry	N/A	100 cfs			
Spring	Average	N/A	150 cfs			
Spring	Wet	N/A	190 cfs			
Summer	Severe	3 cfs	67 cfs	N/A	Trigger: 560 cfs Volume: 2,600 af Duration: 9 days	
Summer	Dry	N/A	67 cfs			
Summer	Average	N/A	92 cfs			
Summer	Wet	N/A	130 cfs			
Fall	Severe	20 cfs	87 cfs	Trigger: 370 cfs Volume: 1,600 af Duration: 8 days	Trigger: 1,400 cfs Volume: 6,300 af Duration: 11 days	
Fall	Dry	N/A	87 cfs			
Fall	Average	N/A	120 cfs			
Fall	Wet	N/A	190 cfs			

cfs = cubic feet per second

af = acre-feet

N/A = not applicable

(10) Pedernales River near Johnson City, Texas, generally described as USGS gage 08153500, and more specifically described as Latitude 30 degrees, 17 minutes, 30 seconds; Longitude 98 degrees, 23 minutes, 57 seconds.

Figure: 30 TAC §298.330(e)(10)

United States Geological Survey Gage 08153500, Pedernales River near Johnson City

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)	Annual Pulse
Winter	Severe	7 cfs	23 cfs	Trigger: 270 cfs Volume: 1,300 af Duration: 9 days	Trigger: 860 cfs Volume: 4,700 af Duration: 15 days	Trigger: 6,980 cfs Volume: 28,320 af Duration: 15 days
Winter	Dry	N/A	23 cfs			
Winter	Average	N/A	45 cfs			
Winter	Wet	N/A	80 cfs			
Spring	Severe	4 cfs	29 cfs	Trigger: 1,700 cfs Volume: 6,300 af Duration: 8 days	Trigger: 3,700 cfs Volume: 14,400 af Duration: 10 days	
Spring	Dry	N/A	29 cfs			
Spring	Average	N/A	60 cfs			
Spring	Wet	N/A	110 cfs			
Summer	Severe	1 cfs	16 cfs	N/A	Trigger: 290 cfs Volume: 1,100 af Duration: 7 days	
Summer	Dry	N/A	16 cfs			
Summer	Average	N/A	29 cfs			
Summer	Wet	N/A	49 cfs			
Fall	Severe	1 cfs	16 cfs	Trigger: 160 cfs Volume: 620 af Duration: 6 days	Trigger: 860 cfs Volume: 3,000 af Duration: 8 days	
Fall	Dry	N/A	16 cfs			
Fall	Average	N/A	29 cfs			
Fall	Wet	N/A	49 cfs			

cfs = cubic feet per second
 af = acre-feet
 N/A = not applicable

(11) Onion Creek near Driftwood, Texas, generally described as USGS gage 08158700, and more specifically described as Latitude 30 degrees, 04 minutes, 58 seconds; Longitude 98 degrees, 00 minutes, 27 seconds.

Figure: 30 TAC §298.330(e)(11)

United States Geological Survey Gage 08158700, Onion Creek near Driftwood

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)	Annual Pulse
Winter	Severe	1 cfs	2 cfs	N/A	Trigger: 170 cfs Volume: 1,900 af Duration: 20 days	Trigger: 1,200 cfs Volume: 8,700 af Duration: 34 days
Winter	Dry	N/A	2 cfs			
Winter	Average	N/A	6 cfs			
Winter	Wet	N/A	26 cfs			
Spring	Severe	1 cfs	4 cfs	Trigger: 200 cfs Volume: 1,100 af Duration: 11 days	Trigger: 620 cfs Volume: 3,700 af Duration: 19 days	
Spring	Dry	N/A	4 cfs			
Spring	Average	N/A	12 cfs			
Spring	Wet	N/A	34 cfs			
Summer	Severe	1 cfs	1 cfs	N/A	N/A	
Summer	Dry	N/A	1 cfs			
Summer	Average	N/A	3 cfs			
Summer	Wet	N/A	7 cfs			
Fall	Severe	1 cfs	1 cfs	Trigger: 18 cfs Volume: 70 af Duration:	Trigger: 120 cfs Volume: 560 af Duration:	
Fall	Dry	N/A	1 cfs			
Fall	Average	N/A	3 cfs			

Fall	Wet	N/A	7 cfs	5 days	11 days	
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cfs = cubic feet per second
 af = acre-feet
 N/A = not applicable

(12) Colorado River at Bastrop, Texas, generally described as USGS gage 08159200, and more specifically described as Latitude 30 degrees, 06 minutes, 16 seconds; Longitude 97 degrees, 19 minutes, 09 seconds.

(A) United States Geological Survey Gage 08159200, Colorado River at Bastrop.

Figure: 30 TAC §298.330(e)(12)(A)

United States Geological Survey Gage 08159200, Colorado River at Bastrop

Season	Month	Hydrologic Condition	Subsistence	Base	Seasonal Pulse (2 per season)
Winter	December	Severe	186 cfs	311 cfs	Magnitude: 3,000 cfs Duration: 4 days
	December	Dry	N/A	311 cfs	
	December	Average	N/A	450 cfs	
	January	Severe	208 cfs	313 cfs	
	January	Dry	N/A	313 cfs	
	January	Average	N/A	433 cfs	
	February	Severe	274	317 cfs	
	February	Dry	N/A	317 cfs	
Spring	March	Severe	274 cfs	274 cfs	Magnitude: 3,000 cfs Duration:
	March	Dry	N/A	274 cfs	
	March	Average	N/A	497 cfs	

	April	Severe	184 cfs	287 cfs	4 days
	April	Dry	N/A	287 cfs	
	April	Average	N/A	635 cfs	
	May	Severe	275 cfs	579 cfs	
	May	Dry	N/A	579 cfs	
	May	Average	N/A	824 cfs	
	June	Severe	202 cfs	418 cfs	
	June	Dry	N/A	418 cfs	
	June	Average	N/A	733 cfs	
Summer	July	Severe	137 cfs	347 cfs	Magnitude: 3,000 cfs Duration: 4 days
	July	Dry	N/A	347 cfs	
	July	Average	N/A	610 cfs	
	August	Severe	123 cfs	194 cfs	
	August	Dry	N/A	194 cfs	
	August	Average	N/A	381 cfs	
Fall	September	Severe	123 cfs	236 cfs	Magnitude: 3,000 cfs Duration: 4 days
	September	Dry	N/A	236 cfs	
	September	Average	N/A	423 cfs	
	October	Severe	127 cfs	245 cfs	
	October	Dry	N/A	245 cfs	
	October	Average	N/A	433 cfs	
	November	Severe	180 cfs	283 cfs	
	November	Dry	N/A	283 cfs	
	November	Average	N/A	424 cfs	

cfs = cubic feet per second

N/A = not applicable

(B) United States Geological Survey Gage 08159200, Colorado
 River at Bastrop.

Figure: 30 TAC §298.330(e)(12)(B)

United States Geological Survey Gage 08159200, Colorado River at Bastrop

Pulse Frequency	Pulse Magnitude	Pulse Duration
1 per 18 months	8,000 cfs	2 days

cfs = cubic feet per second

(13) Colorado River at Columbus, Texas, generally described as USGS gage 08161000, and more specifically described as Latitude 29 degrees, 42 minutes, 22 seconds; Longitude 96 degrees, 32 minutes, 12 seconds.

(A) United States Geological Survey Gage 08161000, Colorado River at Columbus.

Figure: 30 TAC §298.330(e)(13)(A)

United States Geological Survey Gage 08161000, Colorado River at Columbus

Season	Month	Hydrologic Condition	Subsistence	Base	Seasonal Pulse (2 per season)
Winter	December	Severe	301 cfs	464 cfs	Magnitude: 3,000 cfs Duration: 4 days
	December	Dry	N/A	464 cfs	
	December	Average	N/A	737 cfs	
	January	Severe	340 cfs	487 cfs	
	January	Dry	N/A	487 cfs	
	January	Average	N/A	828 cfs	
	February	Severe	375	590 cfs	
	February	Dry	N/A	590 cfs	

	February	Average	N/A	895 cfs	
Spring	March	Severe	375 cfs	525 cfs	Magnitude: 3,000 cfs Duration: 4 days
	March	Dry	N/A	525 cfs	
	March	Average	N/A	1,020 cfs	
	April	Severe	299 cfs	554 cfs	
	April	Dry	N/A	554 cfs	
	April	Average	N/A	977 cfs	
	May	Severe	425 cfs	966 cfs	
	May	Dry	N/A	966 cfs	
	May	Average	N/A	1,316 cfs	
	June	Severe	534 cfs	967 cfs	
	June	Dry	N/A	967 cfs	
	June	Average	N/A	1,440 cfs	
Summer	July	Severe	342 cfs	570 cfs	Magnitude: 3,000 cfs Duration: 4 days
	July	Dry	N/A	570 cfs	
	July	Average	N/A	895 cfs	
	August	Severe	190 cfs	310 cfs	
	August	Dry	N/A	310 cfs	
	August	Average	N/A	516 cfs	
Fall	September	Severe	279 cfs	405 cfs	Magnitude: 3,000 cfs Duration: 4 days
	September	Dry	N/A	405 cfs	
	September	Average	N/A	610 cfs	
	October	Severe	190 cfs	356 cfs	
	October	Dry	N/A	356 cfs	
	October	Average	N/A	741 cfs	
	November	Severe	202 cfs	480 cfs	
	November	Dry	N/A	480 cfs	
	November	Average	N/A	755 cfs	

cfs = cubic feet per second

N/A = not applicable

(B) United States Geological Survey Gage 08161000, Colorado

River at Columbus.

Figure: 30 TAC §298.330(e)(13)(B)

United States Geological Survey Gage 08161000, Colorado River at Columbus

Pulse Frequency	Pulse Magnitude	Pulse Duration
1 per 18 months	8,000 cfs	2 days
1 per 2 years	27,000 cfs	2 days

cfs = cubic feet per second

(14) Colorado River at Wharton, Texas, generally described as USGS gage 08162000, and more specifically described as Latitude 29 degrees, 18 minutes, 32 seconds; Longitude 96 degrees, 06 minutes, 13 seconds.

(A) United States Geological Survey Gage 08162000, Colorado River at Wharton.

Figure: 30 TAC §298.330(e)(14)(A)

United States Geological Survey Gage 08162000, Colorado River at Wharton

Season	Month	Hydrologic Condition	Subsistence	Base	Seasonal Pulse (2 per season)
Winter	December	Severe	202 cfs	470 cfs	Magnitude: 3,000 cfs
	December	Dry	N/A	470 cfs	

	December	Average	N/A	746 cfs	Duration: 4 days
	January	Severe	315 cfs	492 cfs	
	January	Dry	N/A	492 cfs	
	January	Average	N/A	838 cfs	
	February	Severe	303	597 cfs	
	February	Dry	N/A	597 cfs	
	February	Average	N/A	906 cfs	
Spring	March	Severe	204 cfs	531 cfs	Magnitude: 3,000 cfs Duration: 4 days
	March	Dry	N/A	531 cfs	
	March	Average	N/A	1,036 cfs	
	April	Severe	270 cfs	561 cfs	
	April	Dry	N/A	561 cfs	
	April	Average	N/A	1,011 cfs	
	May	Severe	304 cfs	985 cfs	
	May	Dry	N/A	985 cfs	
	May	Average	N/A	1,397 cfs	
	June	Severe	371 cfs	984 cfs	
	June	Dry	N/A	984 cfs	
June	Average	N/A	1,512 cfs		
Summer	July	Severe	212 cfs	577 cfs	Magnitude: 3,000 cfs Duration: 4 days
	July	Dry	N/A	577 cfs	
	July	Average	N/A	906 cfs	
	August	Severe	107 cfs	314 cfs	
	August	Dry	N/A	314 cfs	
	August	Average	N/A	522 cfs	
Fall	September	Severe	188 cfs	410 cfs	Magnitude: 3,000 cfs Duration: 4 days
	September	Dry	N/A	410 cfs	
	September	Average	N/A	617 cfs	
	October	Severe	147 cfs	360 cfs	
	October	Dry	N/A	360 cfs	
	October	Average	N/A	749 cfs	
	November	Severe	173 cfs	486 cfs	
	November	Dry	N/A	486 cfs	
	November	Average	N/A	764 cfs	

cfs = cubic feet per second
 N/A = not applicable

(B) United States Geological Survey Gage 08162000, Colorado River at Wharton.

Figure: 30 TAC §298.330(e)(14)(B)

United States Geological Survey Gage 08162000, Colorado River at Wharton

Pulse Frequency	Pulse Magnitude	Pulse Duration
1 per 18 months	8,000 cfs	2 days
1 per 2 years	27,000 cfs	2 days

cfs = cubic feet per second

(15) Lavaca River near Edna, Texas, generally described as USGS gage 08164000, and more specifically described as Latitude 28 degrees, 57 minutes, 35 seconds; Longitude 96 degrees, 41 minutes, 10 seconds.

Figure: 30 TAC §298.330(e)(15)

United States Geological Survey Gage 08164000, Lavaca River near Edna

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)	Annual Pulse

Winter	Severe	8.5 cfs	30 cfs	Trigger: 2,000 cfs Volume: 8,000 af Duration: 6 days	Trigger: 4,500 cfs Volume: 18,400 af Duration: 7 days	Trigger: 4,500 cfs Volume: 18,400 af Duration: 7 days
Winter	Dry	N/A	30 cfs			
Winter	Average	N/A	55 cfs			
Winter	Wet	N/A	94 cfs			
Spring	Severe	10 cfs	30 cfs	Trigger: 4,500 cfs Volume: 18,400 af Duration: 7 days	Trigger: 4,500 cfs Volume: 18,400 af Duration: 7 days	
Spring	Dry	N/A	30 cfs			
Spring	Average	N/A	55 cfs			
Spring	Wet	N/A	94 cfs			
Summer	Severe	1.3 cfs	20 cfs	Trigger: 88 cfs Volume: 370 af Duration: 4 days	Trigger: 420 cfs Volume: 1,800 af Duration: 6 days	
Summer	Dry	N/A	20 cfs			
Summer	Average	N/A	48 cfs			
Summer	Wet	N/A	33 cfs			
Fall	Severe	1.2 cfs	20 cfs	Trigger: 1,600 cfs Volume: 6,100 af Duration: 5 days	Trigger: 4,500 cfs Volume: 18,000 af Duration: 6 days	
Fall	Dry	N/A	20 cfs			
Fall	Average	N/A	33 cfs			
Fall	Wet	N/A	58 cfs			

cfs = cubic feet per second

af = acre-feet

N/A = not applicable

(16) Navidad River at Strane Park near Edna, Texas, generally described as USGS gage 08164390, and more specifically described as Latitude 29 degrees, 03 minutes, 55 seconds; Longitude 96 degrees, 40 minutes, 26 seconds.

Figure: 30 TAC §298.330(e)(16)

United States Geological Survey Gage 08164390, Navidad River at Strane Park

near Edna

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)	Annual Pulse
Winter	Severe	1 cfs	14 cfs	Trigger: 2,000 cfs Volume: 9,000 af Duration: 6 days	Trigger: 2,500 cfs Volume: 11,250 af Duration: 7 days	Trigger: 2,500 cfs Volume: 11,250 af Duration: 7 days
Winter	Dry	N/A	14 cfs			
Winter	Average	N/A	35 cfs			
Winter	Wet	N/A	71 cfs			
Spring	Severe	2.8 cfs	18 cfs	Trigger: 2,500 cfs Volume: 11,250 af Duration: 7 days	Trigger: 2,500 cfs Volume: 11,250 af Duration: 7 days	
Spring	Dry	N/A	18 cfs			
Spring	Average	N/A	35 cfs			
Spring	Wet	N/A	71 cfs			
Summer	Severe	1.2 cfs	24 cfs	Trigger: 200 cfs Volume: 1,000 af Duration: 5 days	Trigger: 610 cfs Volume: 3,400 af Duration: 6 days	
Summer	Dry	N/A	24 cfs			
Summer	Average	N/A	47 cfs			
Summer	Wet	N/A	84 cfs			
Fall	Severe	2.2 cfs	17 cfs	Trigger: 2,000 cfs Volume: 8,700 af Duration: 6 days	Trigger: 2,500 cfs Volume: 11,250 af Duration: 7 days	
Fall	Dry	N/A	17 cfs			
Fall	Average	N/A	35 cfs			
Fall	Wet	N/A	71 cfs			

cfs = cubic feet per second

af = acre-feet

N/A = not applicable

(17) Sandy Creek near Ganado, Texas, generally described as USGS gage 08164450, and more specifically described as Latitude 29 degrees, 09 minutes, 36 seconds; Longitude 96 degrees, 32 minutes, 46 seconds.

Figure: 30 TAC §298.330(e)(17)

United States Geological Survey Gage 08164450, Sandy Creek near Ganado

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)	Annual Pulse
Winter	Severe	1 cfs	5 cfs	Trigger: 800 cfs Volume: 4,000 af Duration: 6 days	Trigger: 1,800 cfs Volume: 10,000 af Duration: 8 days	Trigger: 2,200 cfs Volume: 12,200 af Duration: 10 days
Winter	Dry	N/A	5 cfs			
Winter	Average	N/A	14 cfs			
Winter	Wet	N/A	30 cfs			
Spring	Severe	1 cfs	5 cfs	Trigger: 1,400 cfs Volume: 7,300 af Duration: 6 days	Trigger: 2,200 cfs Volume: 12,200 af Duration: 10 days	
Spring	Dry	N/A	5 cfs			
Spring	Average	N/A	14 cfs			
Spring	Wet	N/A	30 cfs			
Summer	Severe	1 cfs	9 cfs	Trigger: 91 cfs Volume: 500 af Duration: 4 days	Trigger: 260 cfs Volume: 1,600 af Duration: 7 days	
Summer	Dry	N/A	9 cfs			
Summer	Average	N/A	21 cfs			
Summer	Wet	N/A	39 cfs			
Fall	Severe	1 cfs	9 cfs	Trigger: 630 cfs Volume: 3,100 af Duration: 6 days	Trigger: 1,800 cfs Volume: 9,200 af Duration: 7 days	
Fall	Dry	N/A	9 cfs			
Fall	Average	N/A	21 cfs			
Fall	Wet	N/A	39 cfs			

cfs = cubic feet per second

af = acre-feet

N/A = not applicable

(18) East Mustang Creek near Louise, Texas, generally described as USGS gage 08164504, and more specifically described as Latitude 29 degrees, 04 minutes, 14 seconds; Longitude 96 degrees, 25 minutes, 01 seconds.

Figure: 30 TAC §298.330(e)(18)

United States Geological Survey Gage 08164504, East Mustang Creek near Louise

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)	Annual Pulse
Winter	Severe	1 cfs	1 cfs	Trigger: 150 cfs Volume: 680 af Duration: 5 days	Trigger: 340 cfs Volume: 1,700 af Duration: 8 days	Trigger: 1,000 cfs Volume: 6,000 af Duration: 10 days
Winter	Dry	N/A	1 cfs			
Winter	Average	N/A	2 cfs			
Winter	Wet	N/A	6 cfs			
Spring	Severe	1 cfs	1 cfs	Trigger: 280 cfs Volume: 1,400 af Duration: 7 days	Trigger: 550 cfs Volume: 3,000 af Duration: 9 days	
Spring	Dry	N/A	1 cfs			
Spring	Average	N/A	3 cfs			
Spring	Wet	N/A	6 cfs			
Summer	Severe	1 cfs	2 cfs	Trigger: 20 cfs Volume: 100 af Duration: 5 days	Trigger: 60 cfs Volume: 310 af Duration: 6 days	
Summer	Dry	N/A	2 cfs			
Summer	Average	N/A	5 cfs			
Summer	Wet	N/A	8 cfs			
Fall	Severe	1 cfs	1 cfs	Trigger: 150 cfs Volume: 650 af Duration:	Trigger: 430 cfs Volume: 2,100 af Duration:	
Fall	Dry	N/A	1 cfs			
Fall	Average	N/A	3 cfs			

Fall	Wet	N/A	8 cfs	6 days	7 days	
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cfs = cubic feet per second
 af = acre-feet
 N/A = not applicable

(19) West Mustang Creek near Ganado, Texas, generally described as USGS gage 08164503, and more specifically described as Latitude 29 degrees, 04 minutes, 18.69 seconds; Longitude 96 degrees, 28 minutes, 04.90 seconds.

Figure: 30 TAC §298.330(e)(19)

United States Geological Survey Gage 08164503, West Mustang Creek near Ganado

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)	Annual Pulse
Winter	Severe	1 cfs	4 cfs	Trigger: 470 cfs Volume: 2,400 af Duration: 6 days	Trigger: 1,000 cfs Volume: 5,600 af Duration: 8 days	Trigger: 1,000 cfs Volume: 5,600 af Duration: 8 days
Winter	Dry	N/A	4 cfs			
Winter	Average	N/A	9 cfs			
Winter	Wet	N/A	20 cfs			
Spring	Severe	1 cfs	5 cfs	Trigger: 810 cfs Volume: 4,400 af Duration: 6 days	Trigger: 1,000 cfs Volume: 5,600 af Duration: 8 days	
Spring	Dry	N/A	5 cfs			
Spring	Average	N/A	11 cfs			
Spring	Wet	N/A	20 cfs			
Summer	Severe	1 cfs	10 cfs	Trigger: 75 cfs Volume: 420 af Duration:	Trigger: 190 cfs Volume: 1,200 af Duration:	
Summer	Dry	N/A	10 cfs			
Summer	Average	N/A	18 cfs			

Summer	Wet	N/A	32 cfs	4 days	6 days	
Fall	Severe	1 cfs	6 cfs	Trigger: 470 cfs Volume: 2,200 af Duration: 6 days	Trigger: 1,000 cfs Volume: 5,600 af Duration: 8 days	
Fall	Dry	N/A	6 cfs			
Fall	Average	N/A	14 cfs			
Fall	Wet	N/A	26 cfs			

cfs = cubic feet per second
 af = acre-feet
 N/A = not applicable

(20) Garcitas Creek near Inez, Texas, generally described as USGS gage 08164600, and more specifically described as Latitude 28 degrees, 53 minutes, 28 seconds; Longitude 96 degrees, 49 minutes, 08 seconds.

Figure: 30 TAC §298.330(e)(20)

United States Geological Survey Gage 08164600, Garcitas Creek near Inez

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)	Annual Pulse
Winter	Severe	1 cfs	2 cfs	Trigger: 110 cfs Volume: 520 af Duration: 8 days	Trigger: 380 cfs Volume: 1,500 af Duration: 10 days	Trigger: 380 cfs Volume: 1,500 af Duration: 10 days
Winter	Dry	N/A	2 cfs			
Winter	Average	N/A	4 cfs			
Winter	Wet	N/A	7 cfs			
Spring	Severe	1 cfs	2 cfs	Trigger: 380 cfs Volume: 1,500 af Duration:	Trigger: 380 cfs Volume: 1,500 af Duration:	
Spring	Dry	N/A	2 cfs			
Spring	Average	N/A	4 cfs			

Spring	Wet	N/A	7 cfs	10 days	10 days
Summer	Severe	1 cfs	1 cfs	Trigger: 8 cfs Volume: 28 af Duration: 4 days	Trigger: 36 cfs Volume: 150 af Duration: 8 days
Summer	Dry	N/A	1 cfs		
Summer	Average	N/A	2 cfs		
Summer	Wet	N/A	3 cfs		
Fall	Severe	1 cfs	1 cfs	Trigger: 110 cfs Volume: 420 af Duration: 8 days	Trigger: 380 cfs Volume: 1,500 af Duration: 10 days
Fall	Dry	N/A	1 cfs		
Fall	Average	N/A	2 cfs		
Fall	Wet	N/A	5 cfs		

cfs = cubic feet per second
 af = acre-feet
 N/A = not applicable

(21) Tres Palacios River near Midfield, Texas, generally described as USGS gage 08162600, and more specifically described as Latitude 28 degrees, 55 minutes, 40 seconds; Longitude 96 degrees, 10 minutes, 15 seconds.

Figure: 30 TAC §298.330(e)(21)

United States Geological Survey Gage 08162600, Tres Palacios River near Midfield

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)	Annual Pulse
Winter	Severe	2 cfs	9 cfs	Trigger: 650 cfs Volume: 2,500 af Duration:	Trigger: 1,300 cfs Volume: 4,900 af Duration:	Trigger: 2,000 cfs Volume: 9,000 af Duration:
Winter	Dry	N/A	9 cfs			
Winter	Average	N/A	13 cfs			

Winter	Wet	N/A	18 cfs	6 days	6 days	8 days
Spring	Severe	2.5 cfs	9 cfs	Trigger: 1,200 cfs Volume: 4,400 af Duration: 6 days	Trigger: 1,900 cfs Volume: 7,100 af Duration: 6 days	
Spring	Dry	N/A	9 cfs			
Spring	Average	N/A	13 cfs			
Spring	Wet	N/A	22 cfs			
Summer	Severe	1 cfs	7 cfs	Trigger: 75 cfs Volume: 360 af Duration: 5 days	Trigger: 280 cfs Volume: 1,300 af Duration: 6 days	
Summer	Dry	N/A	7 cfs			
Summer	Average	N/A	13 cfs			
Summer	Wet	N/A	22 cfs			
Fall	Severe	1 cfs	7 cfs	Trigger: 800 cfs Volume: 3,200 af Duration: 6 days	Trigger: 1,900 cfs Volume: 7,700 af Duration: 7 days	
Fall	Dry	N/A	7 cfs			
Fall	Average	N/A	13 cfs			
Fall	Wet	N/A	18 cfs			

cfs = cubic feet per second
 af = acre-feet
 N/A = not applicable

§298.335. Water Right Permit Conditions.

(a) For water right permits with an authorization to store or divert water from the Colorado River above Lake Travis, tributaries of the Colorado River, the Lavaca River Basin, and the Colorado-Lavaca and Lavaca-Guadalupe Coastal Basins, except for water right permits located below Lake Travis on the Colorado River, and to which the environmental flow standards apply, that are issued after the effective date of this subchapter, the water right permit or amendment shall contain flow restriction special

conditions that are adequate to protect the environmental flow standards of this subchapter.

(b) For water right permits with an authorization to divert at a rate greater than 500 cubic feet per second (cfs) or to store more than 2,500 acre-feet in an on-channel reservoir, on the Colorado River below Lake Travis, and to which the environmental flow standards apply, that are issued after the effective date of this subchapter, the water right permit or amendment shall contain flow restriction special conditions that are adequate to protect all pulse flow requirements up to the one year pulse flow requirement except as specified in subsections (c) and (d) of this section.

(c) For water right permits with an authorization to divert at a rate greater than 800 cfs or to store more than 2,500 acre-feet in an on-channel reservoir, on the Colorado River below Lake Travis, and to which the environmental flow standards apply, that are issued after the effective date of this subchapter, the water right permit or amendment shall contain flow restriction special conditions that are adequate to prevent impairment of the one per 18-month pulse flow requirement. Impairment of the one per 18 month pulse flow requirement would occur if the permit, in combination with other permits subject to this subchapter, that are issued after the effective date of this subchapter, would reduce the frequency of occurrence or the average volume of the one per 18-month pulse by more than 10% based on the period of record of the water

availability model in effect at the time the first permit subject to this subchapter is considered.

(d) For water right permits with an authorization to divert at a rate greater than 2,700 cfs or to store more than 2,500 acre-feet in an on-channel reservoir, on the Colorado River below Lake Travis, and to which the environmental flow standards apply, that are issued after the effective date of this subchapter, the water right permit or amendment shall contain flow restriction special conditions that are adequate to protect the one per two-year pulse flow requirement.

(e) For water right permits with an authorization to divert at a rate less than 500 cfs or to store less than 2,500 acre-feet in an on-channel reservoir, on the Colorado River below Lake Travis, and to which the environmental flow standards apply, that are issued after the effective date of this subchapter, the water right permit or amendment shall contain flow restriction special conditions that are adequate to protect the environmental flow standards of this subchapter; however, no special conditions are necessary to preserve or pass high flow pulses.

§298.340. Schedule for Revision of Standards.

The environmental flow standards or environmental flow set-asides adopted in

this subchapter for the Colorado and Lavaca River Basins, the Colorado-Lavaca and Lavaca-Guadalupe Coastal Basins, and Matagorda and Lavaca Bays may be revised by the commission through the rulemaking process. The final revised rules shall be effective no sooner than ten years from the effective date of this rule, unless the Colorado and Lavaca Basin and Bay Area Stakeholder Committee submits a work plan approved by the Environmental Flows Advisory Group under Texas Water Code, §11.02362(p), that provides for a periodic review to occur more frequently. The rulemaking process shall include participation by a balanced representation of stakeholders having interests in the Colorado and Lavaca River Basins, the Colorado-Lavaca and Lavaca-Guadalupe Coastal Basins, and Matagorda and Lavaca Bays.

**SUBCHAPTER E: GUADALUPE, SAN ANTONIO, MISSION, AND ARANSAS
RIVERS, AND MISSION, COPANO, ARANSAS, AND SAN ANTONIO BAYS
§§298.350, 298.355, 298.360, 298.365, 298.370, 298.375, 298.380, 298.385,
298.390**

Statutory Authority

The new sections are adopted under Texas Water Code (TWC), §5.102, concerning General Powers; TWC, §5.103, concerning Rules; and TWC, §5.105 concerning General Policy, which authorize the commission to adopt rules as necessary to carry out its power and duties under the TWC. The new sections are also adopted under TWC, §11.0235, concerning Policy Regarding Waters of the State; TWC, §11.147, concerning Effects of Permit on Bays and Estuaries and Instream Uses; and TWC, §11.1471, concerning Environmental Flow Standards and Set-Asides.

The adopted new sections implement TWC, §§11.0235, 11.147, and 11.1471.

§298.350. Applicability and Purpose.

This subchapter contains the environmental flow standards for the Guadalupe, San Antonio, Mission, and Aransas Rivers, their associated tributaries, and Mission, Copano, Aransas, and San Antonio Bays. The provisions of this subchapter control over

any provisions of Subchapter A of this chapter (relating to General Provisions) that are inconsistent with this subchapter relating to environmental flow standards and regulation in the Guadalupe, San Antonio, Mission, and Aransas Rivers, their associated tributaries, and Mission, Copano, Aransas, and San Antonio Bays.

§298.355. Definitions.

The following words or phrases have the following meanings in this subchapter unless the context clearly indicates otherwise:

(1) Average condition--for all measurement points for which a hydrologic condition is applicable, the hydrologic condition that would occur approximately 50% of the time and that is intended to represent periods that are neither dry nor wet.

(2) Dry condition--for all measurement points for which a hydrologic condition is applicable, the hydrologic condition that would occur approximately 25% of the time and that is intended to represent the driest periods.

(3) Fall--the period of time October through December, inclusive.

(4) Inflow regime level--a freshwater inflow pattern, at the most downstream point in the Guadalupe and San Antonio River Basins for San Antonio Bay, or at the most downstream points in the San Antonio-Nueces Coastal Basin for the Mission-Aransas Estuary, that includes quantities and frequencies.

(5) Modeled permitting frequency--the frequencies at which specific volumes of freshwater inflows occur in the commission's water availability models for the river basins included in this subchapter.

(6) Spring--for the measurement points listed in §298.330(c) of this title (relating to Environmental Flow Standards), the period of time April through June, inclusive.

(7) Sound ecological environment--maintains, to some reasonable level, the physical, chemical, and biological attributes and processes of the natural system.

(8) Strategy target frequency--the frequencies at which specific volumes of freshwater inflows occur, and which are used for the sole purpose of providing additional freshwater inflows to the bays and estuaries included in this subchapter through voluntary strategies.

(9) Summer--for the measurement points listed in §298.330(c) of this title (relating to Environmental Flow Standards), the period of time July through September, inclusive.

(10) Time period--for certain measurement points in the San Antonio River Basin, the period of time specifically listed in the column labeled "time-period" in Figures: 30 TAC §298.380(c)(12)(B), (13)(B), (14)(B), and (15)(B) of this title (relating to Environmental Flow Standards).

(11) Wet condition--for all measurement points for which a hydrologic condition is applicable, the hydrologic condition that would occur approximately 25% of the time and that is intended to represent the wettest period.

(12) Winter--the period of time January through March, inclusive.

§298.360. Findings.

(a) The Guadalupe, San Antonio, Mission, and Aransas Rivers, their associated tributaries, Mission, Copano, Aransas, and San Antonio Bays, and the associated estuaries are substantially sound ecological environments.

(b) For the Guadalupe, San Antonio, Mission, and Aransas Rivers, and their associated tributaries, the commission finds that these sound ecological environments can best be maintained by a set of flow standards that implement a schedule of flow quantities that contain subsistence flow, base flow, and high flow pulses at defined measurement points. Minimum flow levels for these components will vary by season and by year since the amount of precipitation and, therefore, whether a system is in subsistence or base flow conditions, will vary from year to year and within a year from season to season, and the number of pulses protected will also vary with the amount of precipitation.

(c) For Mission, Copano, Aransas, and San Antonio Bays, the commission finds that the sound ecological environment of these bays can best be maintained by a set of freshwater inflow standards that include variable freshwater inflow quantities and that incorporate inflow and frequency targets at which specific levels of freshwater inflow occur, which are used for the sole purpose of providing additional freshwater inflows to Mission, Copano, Aransas, and San Antonio Bays through voluntary strategies.

§298.365. Set-Asides and Standards Priority Date.

The priority date for the environmental flow standards and set-asides established by this subchapter is March 1, 2011. The priority date for the environmental flow

standards will be used in the water availability determination for a new appropriation or for an amendment to an existing water right that increases the amount of water authorized to be stored, taken, or diverted and has no other purpose.

§298.370. Calculation of Hydrologic Conditions.

(a) For new water right authorizations in the San Antonio River Basin and the San Antonio-Nueces Coastal Basin which increase the amount of water authorized to be stored, taken, or diverted as described in §298.10 of this title (relating to Applicability), the determination of the hydrologic condition for a particular season shall be determined once per season. The conditions present on the last day of the month of the preceding season will determine the hydrologic condition for the following season for the applicable measurement point. For each measurement point specified in the applicable river or coastal basin, cumulative streamflow for the previous 12 months will determine the hydrologic condition.

(b) For purposes of permit special conditions related to hydrologic conditions, for water right applications in the San Antonio River Basin and the San Antonio-Nueces Coastal Basin, which increase the amount of water to be stored, taken, or diverted, the hydrologic condition shall be calculated using the full period of record for the United States Geological Survey (USGS) gage at each measurement point such that dry

conditions occur approximately 25% of the time, average conditions occur approximately 50% of the time, and wet conditions occur approximately 25% of the time.

(c) For purposes of water availability determinations, for water right permit applications in the San Antonio River Basin and the San Antonio-Nueces Coastal Basin, which increase the amount of water to be stored, taken, or diverted, hydrologic conditions used in the commission's water availability models shall be calculated such that dry conditions occur approximately 25% of the time, average conditions occur approximately 50% of the time, and wet conditions occur approximately 25% of the time, based on the period of record and simulated flows of the applicable water availability model.

§298.375. Schedule of Flow Quantities.

(a) Schedule of flow quantities. The environmental flow standards adopted by this subchapter constitute a schedule of flow quantities made up of subsistence flow, base flow, and high flow pulses. Environmental flow standards are established for 16 measurement points in §298.380 of this title (relating to Environmental Flow Standards) and this section.

(b) Subsistence flow. The applicable subsistence flow standard varies depending on the seasons as described in §298.355 of this title (relating to Definitions). For a water right holder to which an environmental flow standard applies, at a measurement point that applies to the water right, the water right holder may not store or divert water, unless the flow at the measurement point is above the applicable subsistence flow standard for that point. For measurement points in the Guadalupe River Basin, if the flow at the applicable measurement point is above the subsistence flow standard but below the base flow standard, then the water right holder must allow the applicable subsistence flow, plus 50% of the difference between measured streamflow and the applicable subsistence flow, to pass its measurement point and any remaining flow may be diverted or stored, according to its permit, subject to senior and superior water rights, as long as the flow at the measurement point does not fall below the applicable subsistence flow standard. For measurement points in the San Antonio River Basin and the San Antonio-Nueces Coastal Basin, during dry hydrologic conditions, if the flow at the applicable measurement point is above the subsistence flow standard but below the applicable dry base flow standard, then the water right holder must allow the applicable subsistence flow, plus 50% of the difference between measured streamflow and the applicable subsistence flow, to pass its measurement points and any remaining flow may be diverted or stored, according to its permit, subject to senior and superior water rights, as long as the flow at the measurement point does not fall below the applicable subsistence flow standard.

(c) Base flow. The applicable base flow level varies depending on the seasons as described in §298.355 of this title, and the hydrologic condition described in §298.370 of this title (relating to Calculation of Hydrologic Conditions) for river and coastal basins to which a hydrologic condition applies. For a water right holder in the San Antonio River Basin or the San Antonio-Nueces Coastal Basin, to which an environmental flow standard applies, at a measurement point that applies to the water right, the water right holder is subject to the base flow standard for the hydrologic condition prevailing at that time, i.e., the water right holder will be subject to one of the following: a dry, an average, or a wet base flow standard. For a water right holder in the Guadalupe River Basin, to which an environmental flow standard applies, at a measurement point that applies to a water right, the water right holder is subject to a base flow standard. For a water right holder to which an environmental flow standard applies, at a measurement point that applies to the water right, when the flow at the applicable measurement point is above the applicable base flow standard, but below any applicable high flow pulse trigger levels, the water right holder may store or divert water according to its permit, subject to senior and superior water rights, as long as the flow at the applicable measurement point does not fall below the applicable base flow standard.

(d) High flow pulses. High flow pulses are relatively short-duration, high flows within the watercourse that occur during or immediately following a storm event.

(1) For measurement points in the Guadalupe River Basin, one or two pulses per season are to be passed (i.e., no storage or diversion by an applicable water right holder), if applicable, and as described in §298.380 of this title, if the flows are above the applicable subsistence or base flow standard, and if the applicable high flow pulse trigger level is met at the applicable measurement point. The water right holder shall not divert or store water except during times that streamflow at the applicable measurement point exceeds the applicable high flow pulse trigger level and until either the applicable volume amount has passed the measurement point or the applicable duration time has passed since the high flow pulse trigger level occurred.

(2) For measurement points in the San Antonio River Basin and the San Antonio-Nueces Coastal Basin, one, two, or three pulses per season are to be passed (i.e., no storage or diversion by an applicable water right holder), if applicable, and as described in §298.380 of this title, if the flows are above the applicable base flow standard, and if the applicable high flow pulse trigger level is met at the applicable measurement point. For the measurement points described in §298.380(c) (12) - (15) of this title, the water right holder shall not divert or store water until the daily average flow at the applicable measurement point equals at least the large high flow pulse trigger level on consecutive days equaling the duration time, except during times that streamflow at the applicable measurement point exceeds the applicable high flow pulse

trigger level. For all other measurement points in the San Antonio River Basin and the San Antonio-Nueces Coastal Basin and for small seasonal pulses at the measurement points described in §298.380(c) (12) - (15) of this title, the water right holder shall not divert or store water except during times that streamflow at the applicable measurement point exceeds the applicable high flow pulse trigger level and until either the applicable volume amount has passed the measurement point or the duration time has passed since the high flow pulse trigger level occurred.

(3) If the applicable high flow pulse flow trigger level does not occur in a season, then the water right holder need not stop storing or diverting to produce a high flow pulse. The water right holder is not required to release water lawfully stored to produce a high flow pulse.

(4) Each season is independent of the preceding and subsequent seasons with respect to high flow pulse frequency and each time-period is independent of each other time-period with respect to high flow pulse frequency.

(5) High flow pulses are independent of the hydrologic conditions set out in §298.370 of this title, for measurement points for which a hydrologic condition is applicable. For all other measurement points, high flow pulses are applicable under both subsistence and base flow conditions.

(6) For measurement points in the Guadalupe River Basin, the San Antonio River Basin and the San Antonio-Nueces Coastal Basin, except those described in §298.380(c)(12) - (15) of this title, if a pulse flow requirement for a large seasonal pulse is satisfied for a particular season, one of the smaller pulse requirements is also considered to be satisfied. For measurement points described in §298.380(c)(12) - (15) of this title, if a pulse flow requirement for a large seasonal pulse is satisfied, all smaller pulse requirements for the applicable season are also considered to be satisfied.

(e) Stored water. A water right owner that has stored water in accordance with the terms and conditions of its water right, including any applicable environmental flow requirement in effect at the time the water was stored, may divert, release, or use this water, even if the applicable environmental flow requirement is not met at the time of the subsequent diversion, release, or use of that stored water.

§298.380. Environmental Flow Standards.

(a) A water right application in the Guadalupe and San Antonio River Basins and the San Antonio-Nueces Coastal Basin, which increases the amount of water authorized to be stored, taken, or diverted as described in §298.10 of this title (relating to Applicability), shall not cause or contribute to an impairment of the inflow regimes as

described in the figures in this subsection. Impairment of the inflow regime shall be evaluated as part of the water availability determination for a new water right or amendment that is subject to this subchapter. For purposes of this subsection, impairment would occur if the application, when considered in combination with any authorizations subject to this subchapter, which were issued prior to this application, would impair the modeled permitting frequency of any inflow regime by more than the values set out in paragraphs (3)(A) - (C) and (4)(A) - (C) of this subsection.

(1) Impairment to the modeled permitting frequency shall be calculated individually for each inflow regime level in Figures: 30 TAC §298.380(a)(3) and Figure: 30 TAC §298.380(a)(4) for which a specific frequency is identified at the most downstream point in the water availability model, which represents inflows to San Antonio Bay.

(2) Impairment is calculated by addition or subtraction of the values set out in paragraphs (3)(A) - (C) and (4)(A) - (C) of this subsection, except that impairment of inflow regime Spring 4 and Spring 5 combined shall be calculated as set out in paragraph (3)(C) of this subsection.

(3) Bay and Estuary Freshwater Inflow Standards for the San Antonio Bay System for the Spring Season.

Figure: 30 TAC §298.380(a)(3)

Bay and Estuary Freshwater Inflow Standards for the San Antonio Bay System for the Spring Season

Inflow Regime	Inflow Quantity (February) (af)	Inflow Quantity (March-May) (af)	Strategy Target Frequency
Spring 1	N/A	550,000-925,000	at least 12% of the years
Spring 2	N/A	375,000-550,000	at least 12% of the years
Spring 3	N/A	275,000-375,000	N/A
Spring 4	greater than 75,000	150,000-275,000	N/A
Spring 5	less than 75,000	150,000-275,000	N/A
Spring 6	N/A	0-150,000	no more than 9% of the years
Spring 2 and Spring 3 combined	N/A	N/A	at least 17% of the years
Spring 4 and Spring 5 combined	N/A	N/A	less than 67% of the total

(A) The modeled permitting frequencies for inflow regimes Spring 1, Spring 2, and Spring 2 and Spring 3 combined, as described in Figure: 30 TAC §298.380(a)(3), and calculated as a percentage of total years, shall not be decreased by more than 5%.

(B) The modeled permitting frequencies for the inflow regime Spring 6, as described by Figure: 30 TAC §298.380(a)(3), and calculated as a percentage of total years, shall not be increased by more than 8%.

(C) The modeled permitting frequency for inflow regime Spring 4 and Spring 5 combined, as described in Figure: 30 TAC §298.380(a)(3), and calculated as a percentage of Spring 5 years to the total combined years, shall not be increased to more than 67% of the total years.

(4) Bay and Estuary Freshwater Inflow Standards for the San Antonio Bay System for the Summer Season.

Figure: 30 TAC §298.380(a)(4)

Bay and Estuary Freshwater Inflow Standards for the San Antonio Bay System for the Summer Season

Inflow Regime	Inflow Quantity (June) (af)	Inflow Quantity (July-September) (af)	Strategy Target Frequency
Summer 1	N/A	450,000-800,000	at least 12% of the years
Summer 2	N/A	275,000-450,000	at least 17% of the years
Summer 3	N/A	170,000-275,000	N/A
Summer 4	greater than 40,000	75,000-170,000	N/A
Summer 5	less than	75,000-	N/A

	40,000	170,000	
Summer 6	N/A	50,000-75,000	N/A
Summer 7	N/A	0-50,000	no more than 6% of the years
Summer 2 and Summer 3 combined	N/A	N/A	at least 30% of the years
Summer 4 and Summer 5 combined	N/A	N/A	Summer 5 no more than 17% of the total
Summer 6 and Summer 7 combined	N/A	N/A	no more than 9% of the years

af=acre feet

(A) The modeled permitting frequencies for inflow regimes Summer 1, Summer 2, and Summer 1 and Summer 2 combined, as described in Figure: 30 TAC §298.380(a)(4), and calculated as a percentage of total years, shall not be decreased by more than 5%.

(B) The modeled permitting frequencies for the inflow regime Summer 7, as described by Figure: 30 TAC §298.380(a)(4), and calculated as a percentage of total years, shall not be increased by more than 8%.

(C) The modeled permitting frequency for inflow regime Summer 4 and Summer 5 combined, as described in Figure: 30 TAC §298.380(a)(4), and calculated as

a percentage of Summer 5 years to total combined years, shall not be increased to more than 10%.

(5) Bay and Estuary Freshwater Inflow Standards for Mission and Aransas Bays for the Summer Season.

Figure: 30 TAC §298.380(a)(5)

Bay and Estuary Freshwater Inflow Standards for Mission and Aransas Bays for the Summer Season

Inflow Regime	Inflow Quantity (February) (af)	Inflow Quantity (March-May) (af)	Strategy Target Frequency
Summer 1	N/A	500,000-1,000,000	at least 2% of the years

af=acre feet

(b) To the extent that strategies are implemented through a water rights permit or amendment to help meet the freshwater inflow standards for San Antonio, Mission, Aransas, and Copano Bays, a water right application in the Guadalupe and San Antonio River Basins and the San Antonio-Nueces Coastal Basin, which increases the amount of water authorized to be stored, taken or diverted as described in §298.10 of this title, shall not reduce the modeled permitting frequency for any inflow regime level, listed in Figure: 30 TAC §298.380(a)(1), Figure: 30 TAC §298.380(a)(2), and Figure: 30 TAC §298.380(a)(3), below the level that would occur with the permitted strategy or

strategies in place.

(c) The following environmental flow standards are established for the following described measurement points:

(1) Guadalupe River at Comfort, Texas, generally described as United States Geological Survey (USGS) gage 08167000, and more particularly described as Latitude 29 degrees, 57 minutes, 86 seconds; Longitude 98 degrees, 53 minutes, 49.80 seconds.

Figure: 30 TAC §298.380(c)(1)

United States Geological Survey Gage 08167000, Guadalupe River at Comfort

Season	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)
Winter	31 cfs	110 cfs	Trigger: 140 cfs Volume: 1,030 af Duration: 11 days	Trigger: 350 cfs Volume: 3,390 af Duration: 20 days
Spring	18 cfs	100 cfs	Trigger: 400 cfs Volume: 2,980 af Duration: 17 days	Trigger: 1,190 cfs Volume: 8,950 af Duration: 26 days
Summer	2 cfs	75 cfs	Trigger: 160 cfs Volume: 1,130 af Duration: 12 days	Trigger: 570 cfs Volume: 4,110 af Duration: 19 days
Fall	25 cfs	110 cfs	Trigger: 160 cfs Volume: 1,110 af Duration: 13 days	Trigger: 500 cfs Volume: 4,060 af Duration: 24 days

cfs = cubic feet per second
 af = acre-feet

(2) Guadalupe River near Spring Branch, Texas, generally described as USGS gage 08167500, and more particularly described as Latitude 29 degrees, 51 minutes, 37 seconds; Longitude 98 degrees, 23 minutes, 00 seconds.

Figure: 30 TAC §298.380(c)(2)

United States Geological Survey Gage 08167500, Guadalupe River near Spring Branch

Season	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)
Winter	18 cfs	160 cfs	Trigger: 210 cfs Volume: 1,520 af Duration: 11 days	Trigger: 570 cfs Volume: 5,150 af Duration: 19 days
Spring	18 cfs	160 cfs	Trigger: 870 cfs Volume: 6,500 af Duration: 19 days	Trigger: 2,310 cfs Volume: 17,500 af Duration: 26 days
Summer	18 cfs	110 cfs	Trigger: 240 cfs Volume: 1,520 af Duration: 11 days	Trigger: 870 cfs Volume: 5,970 af Duration: 19 days
Fall	18 cfs	150 cfs	Trigger: 230 cfs Volume: 1,660 af Duration: 12 days	Trigger: 1,000 cfs Volume: 8,060 af Duration: 23 days

cfs = cubic feet per second
 af = acre-feet

(3) Blanco River at Wimberley, Texas, generally described as USGS gage 08171000, and more particularly described as Latitude 29 degrees, 59 minutes, 39 seconds; Longitude 98 degrees, 05 minutes, 19 seconds.

Figure: 30 TAC §298.380(c)(3)

United States Geological Survey Gage 08171000, Blanco River at Wimberley

Season	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)
Winter	10 cfs	52 cfs	Trigger: 54 cfs Volume: 360 af Duration: 10 days	Trigger: 380 cfs Volume: 3,840 af Duration: 28 days
Spring	13 cfs	64 cfs	Trigger: 360 cfs Volume: 2,370 af Duration: 18 days	Trigger: 960 cfs Volume: 6,540 af Duration: 26 days
Summer	8 cfs	56 cfs	Trigger: 74 cfs Volume: 410 af Duration: 9 days	Trigger: 190 cfs Volume: 1,130 af Duration: 13 days
Fall	10 cfs	64 cfs	Trigger: 82 cfs Volume: 500 af Duration: 10 days	Trigger: 440 cfs Volume: 3,220 af Duration: 21 days

cfs = cubic feet per second
 af = acre-feet

(4) San Marcos River at Luling, Texas, generally described as USGS gage 08172000, and more particularly described as Latitude 29 degrees, 39 minutes, 58 seconds; Longitude 97 degrees, 39 minutes, 02 seconds.

Figure: 30 TAC §298.380(c)(4)

United States Geological Survey Gage 08172000, San Marcos River at Luling

Season	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)
Winter	89 cfs	210 cfs	Trigger: 340 cfs Volume: 1,800 af Duration: 8 days	Trigger: 1,330 cfs Volume: 11,400 af Duration: 23 days
Spring	89 cfs	220 cfs	Trigger: 1,140 cfs Volume: 6,800 af Duration: 14 days	Trigger: 1,999 cfs Volume: 18,000 af Duration: 21 days
Summer	73 cfs	220 cfs	Trigger: 240 cfs Volume: 1,090 af	Trigger: 500 cfs Volume: 2,670 af

			Duration: 6 days	Duration: 9 days
Fall	81 cfs	200 cfs	Trigger: 540 cfs Volume: 2,740 af Duration: 9 days	Trigger: 1,710 cfs Volume: 11,200 af Duration: 18 days

cfs = cubic feet per second
 af = acre-feet

(5) Plum Creek near Luling, Texas generally described as USGS gage 08173000, and more particularly described as Latitude 29 degrees, 41 minutes, 58 seconds; Longitude 97 degrees, 36 minutes, 12 seconds.

Figure: 30 TAC §298.380(c)(5)

United States Geological Survey Gage 08173000, Plum Creek near Luling

Season	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)
Winter	3 cfs	12 cfs	Trigger: 350 cfs Volume: 1,800 af Duration: 17 days	Trigger: 1,470 cfs Volume: 6,870 af Duration: 23 days
Spring	2 cfs	10 cfs	Trigger: 720 cfs Volume: 3,300 af Duration: 17 days	Trigger: 2,100 cfs Volume: 8,860 af Duration: 21 days
Summer	1 cfs	5 cfs	Trigger: 48 cfs Volume: 230 af Duration: 10 days	Trigger: 230 cfs Volume: 1,080 af Duration: 15 days
Fall	1 cfs	8 cfs	Trigger: 150 cfs Volume: 720 af Duration: 13 days	Trigger: 750 cfs Volume: 3,280 af Duration: 17 days

cfs = cubic feet per second
 af = acre-feet

(6) Guadalupe River at Gonzales, Texas, generally described as USGS gage 08173900, and more particularly described as Latitude 29 degrees, 29 minutes, 03 seconds; Longitude 97 degrees, 27 minutes, 00 seconds.

Figure: 30 TAC §298.380(c)(6)

United States Geological Survey Gage 08173900, Guadalupe River at Gonzales

Season	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)
Winter	210 cfs	796 cfs	Trigger: 1,150 cfs Volume: 9,640 af Duration: 13 days	Trigger: 4,140 cfs Volume: 48,300 af Duration: 29 days
Spring	210 cfs	791 cfs	Trigger: 3,250 cfs Volume: 26,900 af Duration: 17 days	Trigger: 4,154 cfs Volume: 50,000 af Duration: 24 days
Summer	210 cfs	727 cfs	Trigger: 950 cfs Volume: 7,060 af Duration: 10 days	Trigger: 1,760 cfs Volume: 14,800 af Duration: 14 days
Fall	180 cfs	746 cfs	Trigger: 1,410 cfs Volume: 11,400 af Duration: 13 days	Trigger: 4,154 cfs Volume: 41,200 af Duration: 23 days

cfs = cubic feet per second
 af = acre-feet

(7) Sandies Creek near Westhoff, Texas, generally described as USGS gage 08175000, and more particularly described as Latitude 29 degrees, 12 minutes, 54 seconds; Longitude 97 degrees, 26 minutes, 57 seconds.

Figure: 30 TAC §298.380(c)(7)

United States Geological Survey Gage 08175000, Sandies Creek near Westhoff

Season	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)
Winter	4 cfs	12 cfs	Trigger: 300 cfs Volume: 1,880 af Duration: 16 days	Trigger: 770 cfs Volume: 4,840 af Duration: 21 days
Spring	1 cfs	9 cfs	Trigger: 440 cfs Volume: 2,710 af Duration: 18 days	Trigger: 770 cfs Volume: 4,840 af Duration: 21 days
Summer	1 cfs	4 cfs	Trigger: 59 cfs Volume: 330 af Duration: 11 days	Trigger: 250 cfs Volume: 1,430 af Duration: 16 days
Fall	2 cfs	9 cfs	Trigger: 150 cfs Volume: 960 af Duration: 14 days	Trigger: 570 cfs Volume: 3,650 af Duration: 18 days

cfs = cubic feet per second
 af = acre-feet

(8) Guadalupe River at Cuero, Texas, generally described as USGS gage 08175800, and more particularly described as Latitude 29 degrees, 05 minutes, 25 seconds; Longitude 97 degrees, 19 minutes, 46 seconds.

Figure: 30 TAC §298.380(c)(8)

United States Geological Survey Gage 08175800, Guadalupe River at Cuero

Season	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)
Winter	130 cfs	980 cfs	Trigger: 1,610 cfs Volume: 14,100 af Duration: 13 days	Trigger: 4,610 cfs Volume: 55,300 af Duration: 26 days
Spring	120 cfs	940 cfs	Trigger: 3,370 cfs Volume: 31,800 af Duration: 18 days	Trigger: 8,870 cfs Volume: 100,000 af Duration: 30 days
Summer	130 cfs	800 cfs	Trigger: 1,050 cfs Volume: 8,300 af Duration: 12 days	Trigger: 2,110 cfs Volume: 19,300 af Duration: 17 days

Fall	86 cfs	870 cfs	Trigger: 1,730 cfs Volume: 14,100 af Duration: 13 days	Trigger: 5,200 cfs Volume: 54,700 af Duration: 23 days
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cfs = cubic feet per second
 af = acre-feet

(9) Guadalupe River at Victoria, Texas, generally described as USGS gage 08176500, and more particularly described as Latitude 28 degrees, 47 minutes, 34 seconds; Longitude 97 degrees, 00 minutes, 46 seconds.

Figure: 30 TAC §298.380(c)(9)

United States Geological Survey Gage 08176500, Guadalupe River at Victoria

Season	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)
Winter	160 cfs	975 cfs	Trigger: 1,690 cfs Volume: 14,400 af Duration: 13 days	Trigger: 3,240 cfs Volume: 33,000 af Duration: 18 days
Spring	130 cfs	945 cfs	Trigger: 3,240 cfs Volume: 33,000 af Duration: 18 days	Trigger: 3,240 cfs Volume: 43,500 af Duration: 25 days
Summer	150 cfs	795 cfs	Trigger: 1,040 cfs Volume: 8,570 af Duration: 11 days	Trigger: 2,060 cfs Volume: 19,200 af Duration: 16 days
Fall	110 cfs	865 cfs	Trigger: 1,880 cfs Volume: 15,600 af Duration: 13 days	Trigger: 3,240 cfs Volume: 35,500 af Duration: 23 days

cfs = cubic feet per second
 af = acre-feet

(10) Medina River at Bandera, Texas, generally described as USGS gage 08178880, and more particularly described as Latitude 29 degrees, 43 minutes, 25 seconds; Longitude 99 degrees, 04 minutes, 11 seconds.

Figure: 30 TAC §298.380(c)(10)

United States Geological Survey Gage 08178880, Medina River at Bandera

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)
Winter	Dry	6 cfs	17 cfs	Trigger: 53 cfs	Trigger: 110 cfs
Winter	Average	N/A	32 cfs	Volume: 400 af	Volume: 960 af
Winter	Wet	N/A	54 cfs	Duration: 12 days	Duration: 17 days
Spring	Dry	7 cfs	10 cfs	Trigger: 110 cfs	Trigger: 480 cfs
Spring	Average	N/A	22 cfs	Volume: 900 af	Volume: 4,190 af
Spring	Wet	N/A	48 cfs	Duration: 17 days	Duration: 28 days
Summer	Dry	1 cfs	6 cfs	Trigger: 94 cfs	Trigger: 340 cfs
Summer	Average	N/A	16 cfs	Volume: 670 af	Volume: 2,310 af
Summer	Wet	N/A	41 cfs	Duration: 14 days	Duration: 21 days
Fall	Dry	2 cfs	16 cfs	Trigger: 68 cfs	Trigger: 220 cfs
Fall	Average	N/A	33 cfs	Volume: 500 af	Volume: 1,930 af
Fall	Wet	N/A	49 cfs	Duration: 14 days	Duration: 24 days

cfs = cubic feet per second
 af = acre-feet
 N/A = not applicable

(11) Medina River at San Antonio, Texas, generally described as USGS gage 08181500, and more particularly described as Latitude 29 degrees, 15 minutes, 50 seconds; Longitude 98 degrees, 29 minutes, 26 seconds.

Figure: 30 TAC §298.380(c)(11)

United States Geological Survey Gage 08181500, Medina River at San Antonio

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)
Winter	Dry	14 cfs	20 cfs	Trigger: 120 cfs	Trigger: 350 cfs
Winter	Average	N/A	53 cfs	Volume: 970 af	Volume: 3,570 af
Winter	Wet	N/A	71 cfs	Duration: 15 days	Duration: 27 days
Spring	Dry	12 cfs	37 cfs	Trigger: 380 cfs	Trigger: 1,000 cfs
Spring	Average	N/A	62 cfs	Volume: 2,680 af	Volume: 7,950 af
Spring	Wet	N/A	77 cfs	Duration: 17 days	Duration: 27 days
Summer	Dry	8 cfs	33 cfs	Trigger: 140 cfs	Trigger: 440 cfs
Summer	Average	N/A	57 cfs	Volume: 860 af	Volume: 3,050 af
Summer	Wet	N/A	72 cfs	Duration: 12 days	Duration: 21 days
Fall	Dry	13 cfs	27 cfs	Trigger: 130 cfs	Trigger: 450 cfs
Fall	Average	N/A	60 cfs	Volume: 930 af	Volume: 3,890 af
Fall	Wet	N/A	74 cfs	Duration: 14 days	Duration: 28 days

cfs = cubic feet per second
 af = acre-feet
 N/A = not applicable

(12) San Antonio River near Elmendorf, Texas, generally described as USGS gage 08181800, and more particularly described as Latitude 29 degrees, 13 minutes, 19 seconds; Longitude 98 degrees, 21 minutes, 20 seconds.

(A) United States Geological Survey Gage 08181800, San Antonio River near Elmendorf: Subsistence Flows, Base Flows, and Small Seasonal Pulses.

Figure: 30 TAC §298.380(c)(12)(A)

United States Geological Survey Gage 08181800, San Antonio River near Elmendorf:
 Subsistence Flows, Base Flows, and Small Seasonal Pulses

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse (1 per season)
Winter	Dry	60 cfs	115 cfs	Trigger: 830 cfs Volume: 6,210 af Duration: 14 days
Winter	Average	N/A	262 cfs	
Winter	Wet	N/A	328 cfs	
Spring	Dry	60 cfs	106 cfs	Trigger: 1,560 cfs Volume: 10,700 af Duration: 16 days
Spring	Average	N/A	237 cfs	
Spring	Wet	N/A	364 cfs	
Summer	Dry	60 cfs	87 cfs	Trigger: 1,110 cfs Volume: 6,460 af Duration: 12 days
Summer	Average	N/A	178 cfs	
Summer	Wet	N/A	341 cfs	
Fall	Dry	60 cfs	92 cfs	Trigger: 1,010 cfs

Fall	Average	N/A	223 cfs	Volume: 6,570 af Duration: 13 days
Fall	Wet	N/A	367 cfs	

cfs = cubic feet per second
 af = acre-feet
 N/A = not applicable

(B) United States Geological Survey Gage 08181800, San Antonio

River near Elmendorf: Large Pulses.

Figure: 30 TAC §298.380(c)(12)(B)

United States Geological Survey Gage 08181800, San Antonio River near Elmendorf: Large Pulses

Time Period	Frequency	Trigger	Duration
April through June	3 per time period	3,000 cfs	2 days
May through June	2 per time period	4,000 cfs	2 days
July through November	2 per time period	4,000 cfs	2 days

cfs = cubic feet per second

(13) San Antonio River near Falls City, Texas, generally described as USGS gage 08183500, and more particularly described as Latitude 28 degrees, 57 minutes, 05 seconds; Longitude 98 degrees, 03 minutes, 50 seconds.

(A) United States Geological Survey Gage 08183500, San Antonio

River near Falls City: Subsistence Flows, Base Flows, and Small Seasonal Pulses.

Figure: 30 TAC §298.380(c)(13)(A)

United States Geological Survey Gage 08183500, San Antonio River near Falls City:
 Subsistence Flows, Base Flows, and Small Seasonal Pulses

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse (1 per season)
Winter	Dry	60 cfs	152 cfs	Trigger: 830 cfs Volume: 6,330 af Duration: 16 days
Winter	Average	N/A	292 cfs	
Winter	Wet	N/A	424 cfs	
Spring	Dry	60 cfs	137 cfs	Trigger: 1,670 cfs Volume: 12,300 af Duration: 19 days
Spring	Average	N/A	264 cfs	
Spring	Wet	N/A	467 cfs	
Summer	Dry	60 cfs	113 cfs	Trigger: 1,030 cfs Volume: 6,440 af Duration: 14 days
Summer	Average	N/A	199 cfs	
Summer	Wet	N/A	430 cfs	
Fall	Dry	60 cfs	117 cfs	Trigger: 850 cfs Volume: 5,690 af Duration: 14 days
Fall	Average	N/A	246 cfs	
Fall	Wet	N/A	479 cfs	

cfs = cubic feet per second
 af = acre-feet
 N/A = not applicable

(B) United States Geological Survey Gage 08183500, San Antonio
 River near Falls City: Large Pulses.

Figure: 30 TAC §298.380(c)(13)(B)

United States Geological Survey Gage 08183500, San Antonio River near Falls City: Large Pulses

Time Period	Frequency	Trigger	Duration
April through June	3 per time period	4,000 cfs	2 days
February through April	2 per time period	4,000 cfs	2 days
July through November	2 per time period	6,500 cfs	2 days

cfs = cubic feet per second

(14) Cibolo Creek near Falls City, Texas, generally described as USGS gage 08186000, and more particularly described as Latitude 29 degrees, 00 minutes, 50 seconds; Longitude 97 degrees, 55 minutes, 48 seconds.

(A) United States Geological Survey Gage 08186000, Cibolo Creek near Falls City Subsistence Flows, Base Flows, and Small Seasonal Pulses.

Figure: 30 TAC §298.380(c)(14)(A)

United States Geological Survey Gage 08186000, Cibolo Creek near Falls City
 Subsistence Flows, Base Flows, and Small Seasonal Pulses

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse
Winter	Dry	8 cfs	20 cfs	Trigger: 570 cfs Volume: 3,200 af Duration: 20 days Frequency: 1 per season
Winter	Average	N/A	28 cfs	
Winter	Wet	N/A	39 cfs	
Spring	Dry	8 cfs	16 cfs	N/A
Spring	Average	N/A	28 cfs	
Spring	Wet	N/A	44 cfs	

Summer	Dry	8 cfs	11 cfs	Trigger: 390 cfs Volume: 1,990 af Duration: 15 days Frequency: 1 per season
Summer	Average	N/A	20 cfs	
Summer	Wet	N/A	37 cfs	
Fall	Dry	8 cfs	13 cfs	Trigger: 190 cfs Volume: 1,000 af Duration: 13 days Frequency: 2 per season
Fall	Average	N/A	24 cfs	
Fall	Wet	N/A	40 cfs	

cfs = cubic feet per second
 af = acre-feet
 N/A = not applicable

(B) United States Geological Survey Gage 08186000, Cibolo Creek near Falls City: Large Pulses.

Figure: 30 TAC §298.380(c)(14)(B)

United States Geological Survey Gage 08186000, Cibolo Creek near Falls City: Large Pulses

Time Period	Frequency	Trigger	Duration
April through June	3 per time period	1,000 cfs	2 days
July through October	2 per time period	1,000 cfs	2 days
July through November	2 per time period	2,500 cfs	2 days

cfs = cubic feet per second

(15) San Antonio River at Goliad, Texas, generally described as USGS gage 08188500, and more particularly described as Latitude 28 degrees, 38 minutes, 57.43 seconds; Longitude 97 degrees, 23 minutes, 05.49 seconds.

(A) United States Geological Survey Gage 08188500, San Antonio

River at Goliad: Subsistence Flows, Base Flows, and Small Seasonal Pulses.

Figure: 30 TAC §298.380(c)(15)(A)

United States Geological Survey Gage 08188500, San Antonio River at Goliad:
 Subsistence Flows, Base Flows, and Small Seasonal Pulses

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse
Winter	Dry	60 cfs	200 cfs	Trigger: 1,520 cfs Volume: 12,800 af Duration: 19 days Frequency: 1 per season
Winter	Average	N/A	329 cfs	
Winter	Wet	N/A	469 cfs	
Spring	Dry	60 cfs	174 cfs	Trigger: 1,570 cfs Volume: 11,300 af Duration: 16 days Frequency: 2 per season
Spring	Average	N/A	313 cfs	
Spring	Wet	N/A	502 cfs	
Summer	Dry	60 cfs	139 cfs	Trigger: 1,640 cfs Volume: 11,200 af Duration: 16 days Frequency: 1 per season
Summer	Average	N/A	237 cfs	
Summer	Wet	N/A	481 cfs	
Fall	Dry	60 cfs	167 cfs	Trigger: 2,320 cfs Volume: 17,600 af Duration: 19 days Frequency: 1 per season
Fall	Average	N/A	280 cfs	
Fall	Wet	N/A	584 cfs	

cfs = cubic feet per second

af = acre-feet

N/A = not applicable

(B) United States Geological Survey Gage 08188500, San Antonio

River at Goliad: Large Pulses.

Figure: 30 TAC §298.380(c)(15)(B)

United States Geological Survey Gage 08188500, San Antonio River at Goliad: Large Pulses

Time Period	Frequency	Trigger	Duration
April through June	3 per time period	4,000 cfs	2 days
February through April	2 per time period	4,000 cfs	2 days
July through November	2 per time period	8,000 cfs	2 days

cfs = cubic feet per second

(16) Mission River at Refugio, Texas, generally described as USGS gage 08189500, and more particularly described as Latitude 28 degrees, 17 minutes, 30 seconds; Longitude 97 degrees, 16 minutes, 44 seconds.

Figure: 30 TAC §298.380(c)(16)

United States Geological Survey Gage 08189500, Mission River at Refugio

Season	Hydrologic Condition	Subsistence	Base	Small Seasonal Pulse (2 per season)	Large Seasonal Pulse (1 per season)
Winter	Dry	3 cfs	5 cfs	Trigger: 60 cfs	Trigger: 450 cfs
Winter	Average	N/A	9 cfs	Volume: 310 af	Volume: 2,340 af
Winter	Wet	N/A	15 cfs	Duration: 8 days	Duration: 15 days

Spring	Dry	2 cfs	5 cfs	Trigger: 320 cfs	Trigger: 1,560 cfs
Spring	Average	N/A	8 cfs	Volume: 1,440 af	Volume: 7,910 af
Spring	Wet	N/A	14 cfs	Duration: 10 days	Duration: 18 days
Summer	Dry	1 cfs	4 cfs	Trigger: 57 cfs	Trigger: 420 cfs
Summer	Average	N/A	7 cfs	Volume: 240 af	Volume: 2,010 af
Summer	Wet	N/A	12 cfs	Duration: 6 days	Duration: 12 days
Fall	Dry	2 cfs	5 cfs	Trigger: 45 cfs	Trigger: 410 cfs
Fall	Average	N/A	8 cfs	Volume: 200 af	Volume: 2,090 af
Fall	Wet	N/A	15 cfs	Duration: 6 days	Duration: 14 days

cfs = cubic feet per second

af = acre-feet

N/A = not applicable

§298.385. Water Right Permit Conditions.

(a) For water right permits with an authorization to store or divert water in the Guadalupe and San Antonio River Basins and the San Antonio-Nueces Coastal Basin, to which the environmental flow standards apply, that are issued after the effective date of this subchapter, the water right permit or amendment shall contain flow restriction special conditions that are adequate to protect the environmental flow standards of this subchapter.

(b) For water right permits with an authorization to divert water in the Guadalupe and San Antonio River Basins and the San Antonio-Nueces Coastal Basin at a rate less than 20% of the pulse trigger level requirements of an applicable high flow pulse at a measurement point, as described in §298.380(c) of this title (relating to Environmental Flow Standards), and to which the environmental flow standards apply, that are issued after the effective date of this subchapter, the water right permit or amendment shall contain flow restriction special conditions that are adequate to protect the environmental flow standards of this subchapter; however, no special conditions are necessary to preserve or pass that applicable high flow pulse.

§298.390. Schedule for Revision of Standards.

The environmental flow standards or environmental flow set-asides adopted in this subchapter for the Guadalupe, San Antonio, Mission, and Aransas Rivers, their associated tributaries, Mission, Copano, Aransas, and San Antonio Bays, and the associated estuaries may be revised by the commission through the rulemaking process. The final revised rules shall be effective no sooner than ten years from the effective date of this rule, unless the Guadalupe, San Antonio, Mission, and Aransas Basin and Bay Area Stakeholder Committee submits a work plan approved by the advisory group under Texas Water Code, §11.02362(p), that provides for a periodic review to occur more frequently. The rulemaking process shall include participation by a balanced

representation of stakeholders having interests in the Guadalupe, San Antonio, Mission, and Aransas Rivers, their associated tributaries, Mission, Copano, Aransas, and San Antonio Bays.