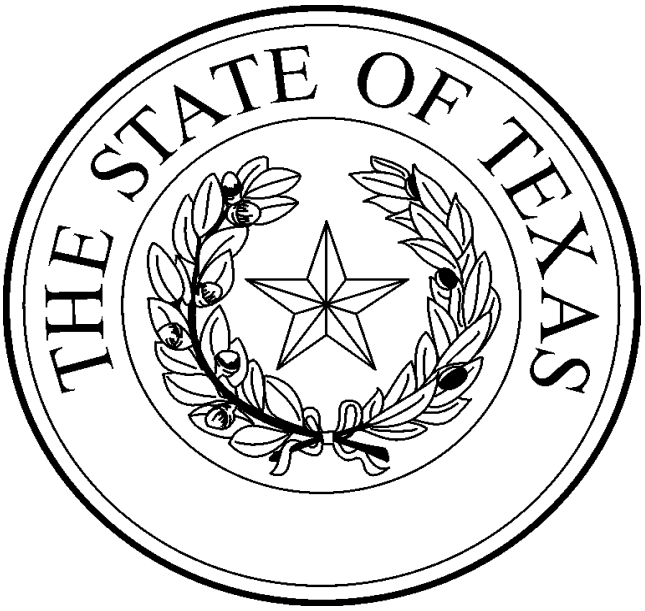
Joint Committee on the Study Commission on Water for Environmental Flows



Interim Report to the 79th Legislature

December 2004

Study Commission on Water for Environmental Flows

The Honorable Kenneth Armbrister
Co-Presiding Officer

The Honorable Robert R. Puente
Co-Presiding Officer

Members:

The Honorable Todd Staples

The Honorable Jeff Wentworth

The Honorable William A. Callegari

The Honorable Charlie L. Geren

Joseph J. Beal, P.E.

Jerry L. Clark

Joseph B.C. Fitzsimons

David Herndon

E. G. Rod Pittman

Andrew Sansom

Kathleen Hartnett White

W.E. "Bill" West Jr.

Ben F. Vaughan IV

December 21, 2004

The Honorable David Dewhurst, Lieutenant Governor of Texas
The Honorable Tom Craddick, Speaker of the Texas House
Members of the Texas Legislature
Texas State Capitol
Austin, Texas 78701

Dear Governor Dewhurst, Speaker Craddick and Members:

The Study Commission on Water for Environmental Flows of the Seventy-Eighth Legislature hereby submits its interim report, including findings and recommendations, for consideration by the Seventy-Ninth Legislature.

Respectfully submitted,

Senator Ken Armbrister

Representative Robert Puente

Senator Todd Staples

Representative Bill Callegari

Senator Jeff Wentworth

Representative Charlie Geren

Joseph J. Beal

Jerry Lynn Clark

Joseph B. C. Fitzsimons

David Herndon

E.G. Rod Pittman

Andrew Sansom

W.E. "Bill" West

Kathleen Hartnett White

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STUDY COMMISSION ON WATER FOR ENVIRONMENTAL FLOWS

Summary of Hearings

During the 78th regular session of the Texas Legislature, Senate Bill 1639 was enacted relating to regulating the waters of the state, including the spacing and production of groundwater and the control of instream flows. The bill, in part, created the Study Commission on Water for Environmental Flows (Study Commission) and charged them with: 1. Conducting public hearings and evaluating public policy implications regarding the balance of demands on the State's water resources; 2. Assessing the granting of permits for environmental flows; 3. Assessing options available for the protection/preservation/provision of environmental flows; and 4. Assessing allocation options to meet identified environmental water needs. The legislation also called for the Study Commission to appoint an science advisory committee that would serve as impartial advisors and reviewers for the Study Commission.

On February 18, 2004, the Study Commission held its first public meeting in San Antonio, Texas, and invited testimony from resource agencies and interested stakeholders. In addition to hearing testimony, the Study Commission appointed a nine-member science advisory committee and charged the committee with reviewing the current hydrological conditions in the state, and assessing available methodologies for identifying environmental flow needs.

On November 3, 2004, the Study Commission held a meeting in the Capitol Extension, Austin, Texas, to receive a report from the Science Advisory Committee (SAC), and to receive public testimony regarding environmental flows. Dr. Robert J. Brandes, Chairman of the SAC, provided an overview of the committee's final report, and responded to questions from members of the Study Commission. Public testimony focused on the need for action by the legislature and state resource agencies to address the issue of protecting and providing for environmental flows. Witnesses suggested immediate action should be taken since there were several major water right permit applications pending and there was a need to ensure environmental flow considerations were a part of the assessment process.

Senate Bill 1639 also included a provision stating that the Study Commission would "…issue a report summarizing: (1) any hearings conducted by the study commission; (2) any studies conducted by the study commission; (3) any legislation proposed by the study commission; and (4) any other findings and recommendations of the study commission."

The Study Commission is abolished and the section of the Texas Water Code establishing the Study Commission expires September 1, 2005.

Attached are brief summaries of the two Study Commission meetings.

HEARING SUMMARY

Commission: Study Commission on Water for Environmental Flows

Date of Hearing: February 18, 2004

Members Present: Co-Presiding Officers Kenneth Armbrister and Robert Puente, Senators Todd Staples and Jeff Wentworth, Representatives Bill Callegari and Charlie Geren, Texas Commission on Environmental Quality (TCEQ) Chairman Kathleen White, Texas Water Development Board (TWDB) Chairman E.G. Rod Pittman, Texas Parks and Wildlife Department (TPWD) Chairman Joseph Fitzsimons, Jerry Clark, David Herndon, Andrew Sansom, Bill West and Ben Vaughan IV were in attendance. Though not members of the Study Commission, Senators Leticia Van de Putte, Robert Duncan, Bob Deuell and Jon Lindsay were in attendance.

Testimony:

Margaret Hoffman, Executive Director, Texas Commission on Environmental Quality, provided an overview of the TCEQ's water permitting efforts in Texas, including consideration of environmental flow conditions.

Justice Gregory J. Hobbs, Colorado Supreme Court, provided testimony on water permitting in the western states. He discussed the donation, transfer and purchase of an amount of water beneficially used to transfer downstream, and provided the Study Commission written materials on Colorado law.

Lauren Alexander, Study Director, National Academy of Sciences (NAS), provided testimony on NAS review of the Texas Instream Flow Studies Program.

Greg Rothe, General Manager, San Antonio River Authority, provided testimony on the Texas Water Conservation Association (TWCA) proposal for protection of environmental flows.

Ken Kramer, Director, Lone Star Chapter of the Sierra Club, provided testimony regarding Sierra Club's concerns with the TWCA proposal. In addition, Myron Hess, Attorney, National Wildlife Federation, provided testimony and offered an alternative proposal.

Finally, the Study Commission appointed the Science Advisory Committee. The Members are George H. Ward, Jr., Robert J. Brandes, Paul A. Montagna, Dwight K. Shellman, Jr., Larry M. Hauck, Mitchell L. Mathis, Jeff Taylor, B.L. Harris and Clay J. Landry.

HEARING SUMMARY

Commission: Study Commission on Water for Environmental Flows

Date of Hearing: November 3, 2004

Members Present: Co-Presiding Officers Kenneth Armbrister and Robert Puente, Senator Todd Staples, Representatives Bill Callegari and Charlie Geren, TCEQ Chairman Kathleen White, TWDB Chairman E.G. Rod Pittman, TPWD Chairman Joseph Fitzsimons, Joe Beal, Jerry Clark, David Herndon, Andrew Sansom, Bill West and Ben Vaughan IV were in attendance.

Testimony:

Dr. Robert J. Brandes, Chairman, Science Advisory Committee (SAC) provided the Commission with the SAC's report. Dr. Brandes addressed the charges given the SAC by the study commission, noting that, in general, environmental flow issues required further in-depth study and review.

The following persons provided public testimony on the SAC report, all urging the need for action by the legislature to protect environmental flows:

Myron Hess, National Wildlife Federation
Diane Wassenich, San Marcos River Foundation
Glenda Calloway, Galveston Bay Foundation

Mr. Dudley Light also testified on other environmental issues.

Summary of the Science Advisory Committee to the Study Commission on Water for Environmental Flows

Science Advisory Committee to the Study Commission on Water For Environmental Flows

Summary of Hearings and Report

In 2003, the Texas Legislature enacted Senate Bill 1639, which, in part, created the Study Commission on Water For Environmental Flows (Study Commission). The Study Commission was charged to "…conduct public hearings and study public policy implications for balancing the demands on the water resources of the state resulting from a growing population with the requirements of the riverine, bay, and estuary systems including granting permits for instream flows dedicated to environmental needs or bay and estuary inflows, use of the Texas Water Trust, and any other issues that the study commission determines have importance and relevance to the protection of environmental flows."

Senate Bill 1639 also provided that the Study Commission could appoint a scientific advisory committee that would "…serve as impartial scientific advisors and reviewers…" and would "…have a membership of no fewer than five and no more than nine total members chosen by the study commission to represent a variety of areas of relevant technical expertise…"

At the initial meeting of the Study Commission held February 18, 2004, in San Antonio, Texas, members considered and approved nine appointments to the Science Advisory Committee (SAC): George H. Ward, Jr., Robert J. Brandes, Paul A. Montagna, Dwight K. Shellman Jr., Larry M. Hauck, Mitchell L. Mathis, Jeff Taylor, B.L. Harris and Clay J. Landry. Subsequent to the meeting, the Study Commission provided the following charges to the committee:

1. Provide a description of the current hydrologic conditions, streamflow patterns across the State in major river basins, and freshwater inflow patterns for major bay and estuary systems along the coast, relative to historical and existing environmental flows.

2. Evaluate the analytical tools and/or procedures that are used or available to assess the requirements for preservation, maintenance, or enhancement of aquatic resources and riparian habitat.

3. Identify ecological parameters or ecosystem characteristics to be considered in determining environmental flow needs for the State's surface water resources and identification of implementation options.

4. Provide any other technical information the Science Advisory Committee feels would be beneficial to the Study Commission on Water For Environmental Flows.

During initial deliberations, SAC members agreed to develop a work plan, which incorporated all elements contained in the charges provided by the Study Commission. Those elements included the following: surface water management in Texas; current state agency roles; general hydrologic

conditions; general aquatic ecosystem conditions; environmental flow tools and procedures; instream flow methodologies; bay and estuary methodologies; environmental flow criteria; and environmental flow implementation strategies. The work of the SAC and any findings, were to be included in a summary report to the Study Commission.

The SAC has conducted three public meetings and held eight conference calls since April 29, 2004. Their work has focused on compiling and assimilating all available information deemed relevant to assessing environmental flow needs in the State, and reviewing the efforts of other states and countries to address similar issues. The summary report presents a characterization of the physical, hydrological, and biological resources of the State, provides an assessment of environmental flow assessment "tools" currently used by the State, describes other available tools, discusses management options and implementation strategies for environmental flows, and provides a summary of findings based on the charges by the Study Commission.

On November 3, 2004, the SAC provided a summary of its report at a meeting of the Study Commission and responded to questions from individual members. It is the consensus of the SAC that Texas has made great strides in data collection and studies assessing the State's aquatic systems, however, additional work needs to be done to understand the health of these systems and the specific flow values necessary to maintain that health. Attached is the Executive Summary of the SAC's Final Report, which provides a brief overview of the committee's findings.

EXECUTIVE SUMMARY

The question is not whether environmental flows are important and should be protected, but rather, how, when, and where, and in what quantities should flows be reserved for environmental purposes in the state's rivers and streams and its bays and estuaries. The State of Texas has investigated environmental flow issues for several decades. Scientific methods, protocols, and understanding regarding environmental flows have significantly progressed through the course of the previous 40 years and continue to evolve and improve. Due to the complexities of environmental flow issues and continuing advances in scientific understanding, additional work is needed. While the State of Texas has pioneered tools to address freshwater inflow needs for bays and estuaries, there are limitations to these tools in light of both scientific and public policy evolution. To fully address bay and estuary environmental flow issues, the foundation of work accomplished by the state should be improved. While the Texas Instream Flow Studies program appears to encompass a comprehensive and scientific approach for establishing environmental flow needs for rivers and streams across the state, more extensive review and examination of the details of the program, which may not be fully developed until the program is underway, are needed to ensure an effective tool for evaluating riverine environmental flow conditions.

Legislative directive within Texas on environmental flows has also changed over recent decades. This change in directive reflects the evolving state of understanding of the environmental flow problem. In 1985, the Legislature directed the state water agencies to determine sufficient beneficial freshwater inflows "… for the maintenance of productivity of economically important and ecologically characteristic sport or commercial fish and shellfish species and estuarine life upon which such fish and shellfish are dependent." This is essentially a macro-level approach to the question of sufficient freshwater inflows. The apparent interpretation of this language by the state resource agencies was that it meant to determine inflows that could support key (i.e., a subset of) sport and commercial fish and shellfish species.

By year 2001, within Senate Bill 2, the Legislature directed the state water agencies to "… conduct studies and analyses to determine appropriate methodologies for determining flow conditions in the state's rivers and streams necessary to support a sound ecological environment." Addressing a sound ecological environment requires study of the total (complete) aquatic ecosystem and, from a scientific perspective, emphasizes preservation of habitat for desired species as opposed to the state's earlier focus on species abundance. Senate Bill 1639 in the 78th Legislative Session continued the Senate Bill 2 theme, identifying "biological soundness" as a goal for the state's waters. Biological soundness should be distinguished from soundness of the hydrologic, geomorphologic, or any of the other natural sciences as it relates to streamflows.

Today, the State of Texas is at a crossroads, where the science of evaluating and determining environmental flows is being comprehensively assessed as a contribution to the state's effort to develop effective environmental flow policy. Based on review of this subject by the Science Advisory Committee, the following observations are offered.

1. *A "one-size-fits-all" answer is not correct within Texas.* The current climatologic, hydrologic, and aquatic environments vary drastically across the state, meaning some parts are more fragile or more susceptible to harm with small changes in environmental flows. This fact must be acknowledged and considered with respect to scientific study, water management strategy implementation, and regulatory permitting. In the future as in the past, basin and subbasin scientific studies must be devised and then implemented. It is important that in the future the development of environmental flows pursuant to permitting must recognize the essential qualities of specific locations.

2. *Future scientific studies need to focus in more detail on the specific relationship between sound ecological environment and streamflows.* Scientific analysis objectives within the state should be directed toward defining what constitutes a sound ecological environment and the interconnections between streamflows and the biology and hydrography of riverine and estuarine systems. From such scientifically established relations are determined the environmental flows necessary to maintain a sound

ecological environment.

3. *Completion of the Texas Instream Flow Studies program and improvement of the bays and estuaries freshwater inflow studies are essential.* Each of these efforts is critical for the state to achieve its goals relative to environmental flows.

4. *Participation by stakeholders and water interests in the environmental flow program and rigorous scientific review are of paramount importance to achieving acceptable environmental flows.* Only through a transparent process can appropriate scientific methods be employed and scientific results be formulated.

5. *For evaluating environmental flows for rivers and streams, statistical desk-top methods and associated technical analyses must be enhanced to facilitate regulatory permitting actions until such time as the Texas Instream Flow Studies program is completed.* The current Lyons and CPC methods appear to have limitations as currently applied. A body of professionals should be charged with review of currently available assessment tools and the development of alternative methodologies for evaluating riverine systems. These enhanced methodologies may also be necessary in the long term as the Texas Instream Flow Studies program may be too resource intensive for every situation.

6. *The TWDB's State Methodology and the TPWD's "verification" process used to develop freshwater inflow recommendations for the state's bays and estuaries exhibit scientific shortcomings that must be addressed.* The measure of abundance used is commercial harvest (except for the recent Sabine Lake recommendations), which has a poor relation to ecological soundness; the various statistical methods employed are questionable, including regression forms and definition of independent variables; the resulting "optimum" inflow regime is mainly determined by constraints, which are arbitrarily specified; and the optimum solution bears no relation to actual harvests, nor do the optimum patterns of inflow occur in the natural hydrology. The TPWD's verification process is actually a comparative analysis between the *minQ* and *maxH* solutions, and favors the optimal solution with the greater inflow to the bay. One of the most important questions relating to management of inflows to the Texas bays is unanswered by the State Methodology and the TPWD verification analysis, namely under drought conditions what inflows must a bay receive to maintain its ecosystem over the long term.

7. *Adaptive management and precautionary principle methods must be incorporated into the scientific study, management strategy implementation, and regulatory permitting phases of future environmental flow activities.* History proves that the present science of environmental flows is complex, inexact, and subject to varying levels of uncertainty. These shortcomings identify a need for an overall environmental flow

strategy that facilitates change as future information becomes available. Any future adaptive management approach must consider the need for assuring dependable water supplies for human use and must provide reasonable and scientifically-determined boundaries that limit supply risk while also recognizing scientific uncertainty and erring on the side of caution if the risks of environmental damage are high.

8. *There are both regulatory strategies and market-based strategies that can be used to provide for environmental flows.* The state currently has mechanisms for both, but it is not evident that these approaches, as currently structured, are adequate to comprehensively ensure target environmental flows. Further evaluation of existing and alternative regulatory and market-based approaches should be explored to provide for a more comprehensive and effective environmental flow program that addresses both riverine and estuarine needs for the state.

The need for defensible science and acceptable answers relative to the state's environmental flow programs is of paramount importance. While progress has been made, there is work to be done. The Texas Instream Flow Studies program provides the framework for developing scientifically-based basin- and subbasin-specific estimates of environmental flows for rivers and streams across the state, and it needs to proceed following the National Academy of Sciences (NAS) review. Likewise, the data and methodologies being employed for establishing freshwater inflow requirements for the state's bays and estuaries and the results generated need to be thoroughly examined and modified as necessary to provide more scientifically-based answers that are responsive to actual needs of the coastal systems. Less consideration should be given to determining "optimal" levels of freshwater inflow to the bays and estuaries, and more emphasis should be placed on addressing the extreme hydrological events that periodically cause major stresses on the ecological integrity of these systems, notably low-flow and drought conditions.

Proposed Strategy for Protecting Environmental Flows

Proposed Strategy for Protecting Environmental Flows

The Study Commission on Water for Environmental Flows (Flows Commission) submits to the 79th Legislature this report outlining a proposed strategy to address the protection of environmental flows. This strategy is based upon a consensus proposal that was developed by a stakeholder working group comprised of representatives of the water development and environmental communities, including members of the Flows Commission.

The Flows Commission notes that this proposed strategy provides a general policy framework, and emphasizes that this conceptual framework would require extensive and detailed development for statutory and/or regulatory implementation. Additionally, implementation of this proposal would require more effective water rights administration and enforcement systems than are currently available in most areas of the State.

Nothing in this proposed strategy would diminish the current jurisdiction or authority of the Texas Commission on Environmental Quality (TCEQ), the Texas Parks and Wildlife Department (TPWD) ,or the Texas Water Development Board (TWDB). Nor would this proposal conflict with any current statutory provisions relating to bays and estuaries (B&E) studies or instream flow studies.

RECOMMENDATIONS:

A. Reauthorize the Study Commission on Water for Environmental Flows (Flows Commission) to continue its efforts to address environmental flow issues, including those listed below, as identified in the October 26, 2004 Science Advisory Committee Report on Water For Environmental Flows,

> "While the State of Texas has pioneered tools to address freshwater inflow needs for bays and estuaries, there are limitations to these tools in light of both scientific and public policy evolution. To fully address bay and estuary environmental flow issues, the foundation of work accomplished

by the state should be improved. While the Texas Instream Flow Studies program appears to encompass a comprehensive and scientific approach for establishing environmental flow needs for rivers and streams across the state, more extensive review and examination of the details of the program, which may not be fully developed until the program is underway, are needed to ensure an effective tool for evaluating riverine environmental flow conditions."

The Flows Commission will designate a statewide science advisory committee, the Texas Science Advisory Committee (TSAC), to advise and make recommendations to the Flows Commission, and to help provide overall direction, coordination and consistency relating to:

- environmental flow methodologies for B&E studies and instream flow studies;
- environmental flow programs at the TCEQ, TPWD, and TWDB; and
- the work of the Bay/Basin Expert Science Teams described in A(3) below.

The TCEQ, TPWD and TWDB will provide written responses to recommendations received from the TSAC through the Flows Commission, with such responses describing the agencies' actions regarding each recommendation including justification for any recommendation not implemented.

1. The Flows Commission will appoint a Bay/Basin Area Stakeholders (BBAS) group for each bay/basin ecological area of the State as defined by the Flows Commission. Each BBAS will consist of appropriate environmental flow stakeholders, including but not limited to representatives from agriculture, recreational users, municipalities, soil and water conservation districts, industry, public interest groups, regional water planning groups, groundwater and surface water districts and authorities, and environmental interests.

2. A priority system is established herein (in Section B(1)) to prioritize the initial determinations of environmental flow needs on a temporal and geographic basis.

3. Each BBAS will establish a unique Bay/Basin Expert Science Team (BBEST) for its bay/basin ecological area, to be comprised of qualified experts in the fields of hydrology/hydraulics, water resources, aquatic and terrestrial biology, geomorphology, geology, water quality, computer modeling, and other technical areas relevant to the evaluation of environmental flows. In addition, the Texas Science Advisory Committee (TSAC) will appoint one of its members to serve as a liaison member of each BBEST, to facilitate coordination and consistency in environmental flow activities throughout the State. The TCEQ, TWDB and TPWD will provide technical assistance to the BBESTs.

4. Each Bay/Basin Expert Science Team (BBEST) will develop environmental flow regime recommendations for its bay/basin ecological area through a collaborative process, considering all available science and based solely on the best available science. Each BBEST will submit the science-based recommendations to its associated BBAS and to the Flows Commission. Neither the BBAS nor the Flows Commission are empowered to change the BBEST's recommendations.

   The Flows Commission, with input from the Texas Science Advisory Committee (TSAC), will review the BBEST's science-based environmental flow regime recommendations and will submit them, with comments if appropriate, to the TCEQ .

5. The Bay/Basin Area Stakeholders (BBAS) group will review the BBEST's science-based flow regime recommendations and will consider them in conjunction with other factors, including future needs and economics related to water supply planning in the bay/basin. The BBAS will develop its own recommendations regarding environmental flows and strategies to meet those flow

needs, and will submit these recommendations to the TCEQ and to the Flows Commission.

6. After submitting its environmental flows and strategies recommendations to the TCEQ, the BBAS, with the assistance of the BBEST, will prepare, and submit for the Flows Commission's approval, a Work Plan outlining specific monitoring, studies, activities, and a schedule for the continuing validation and/or refinement of the bay/basin environmental flow recommendations. The schedule is to include a periodic review of the bay/basin environmental flow needs and strategies at least every 10 years.

7. Upon receiving the environmental flow recommendations from the Flows Commission and from the BBAS, the TCEQ will initiate a rule-making process to determine the environmental flow requirements for that bay/basin, based on the flow regime recommendations from the BBEST and the BBAS. The TCEQ will independently determine the environmental flow requirements for the bay/basin ecological area taking into account the specific bay/basin characteristics, economics, all available scientific information, including any developed science from the Flows Commission, and other appropriate input.

   This determination will be manifest in a rule for each basin that, among other actions, will establish a "floor" or environmental flow set-aside below which water could not be appropriate. This environmental flow set-aside would consist of a flow regime of different flow requirements that could vary spatially and/or temporally. This environmental flow set-aside will be included in the appropriate Water Availability Model (WAM) and used by the TCEQ to evaluate the availability of water for permitting.

As with existing water rights, the TCEQ will have primary enforcement authority with respect to all environmental flow set-asides. The TPWD will be granted the authority to act with respect to the set-asides in the same manner that water rights holders may protect their rights. The set-asides can only be altered by emergency conditions as established by law or through changes promulgated through the TCEQ rule-making process as part of the periodic review stipulated in A(6) for each bay/basin ecological area. Set-asides will be reviewed at least every ten years in order to consider improvements in science related to environmental flows and projected human needs.

8. The overall environmental flow process outlined herein will allow local issues to be considered and local solutions for environmental flow requirements to be developed.

9. Adequate funding, including core funding from the State and funding from other appropriate and available sources, will be necessary to implement this process effectively.

B. The environmental flow process as outlined herein will be implemented for priority bay/basin ecological areas according to the following suggested schedule. This schedule was not developed in consultation with representatives from all of the affected bay/basins. Therefore, adjustments may be necessary. It is, however, imperative that appropriate deadlines be established by statute for the priority bay/basin ecological areas.

1. The recommended schedule for priority bay/basins is:

First Round:	Galveston, Sabine
Second Round:	Colorado, Guadalupe

Third Round: Nueces, Rio Grande, Brazos

a. September 1, 2005: Bay Basin Area Stakeholders (BBAS) are appointed for First Round Bay/Basins.

b. November 1, 2005: The Bay Basin Expert Science Teams (BBEST) are established for First Round Bays/Basins.

c. October 31, 2006: BBEST recommendations finalized and submitted to BBAS, the Flows Commission, and TCEQ for First Round Bays/Basins.

d. February 28, 2007: BBAS comments/recommendations finalized and submitted to TCEQ for First Round Bays/Basins.

e. December 31, 2007: TCEQ adopts environmental flow "set-asides" for the First Round Bays/Basins.

2. Timelines will be established for remaining bay/basin ecological areas designed to result in environmental flow set-asides for those bay/basin ecological areas as soon as is reasonably possible. These timelines will be initially developed by the respective BBAS and BBEST for each bay/basin ecological area and then finalized through coordination with the TCEQ, TPWD and TPWD under the overall direction of the Flows Commission.

The proposed environmental flow process presented above assumes that the Flows Commission will remain in place, that environmental flow recommendations for a particular bay/basin ecological area will include a full flow regime for both instream flows and bay and estuary freshwater inflows, that an initial priority ranking of bay/basins

is established, and that the determination of environmental flows is adaptive based on evolving science or other factors to be reviewed at least every ten years.

C. This proposed strategy assumes that specific procedures will be established during implementation to address currently pending and future permit applications within a bay/basin ecological area prior to the establishment of an environmental flow set-aside as provided for in A.(7).

For such applications, permit conditions for environmental flow protection should be based on current law and existing practices as they may be refined, including use of newly developed instream flow desktop methods and/or revised bay and estuary inflow methodologies recommended by the TSAC. If, after a permit is issued, it is determined through TCEQ rule-making as outlined in Section A, that more water is needed for environmental flow protection, the TCEQ may increase the environmental flow requirement stipulated in the permit by no more than 10% to 15% of the total annual environmental flow amount.

D. In view of the over-appropriation of water in some bay/basin systems, the Water Code should allow for a full range of options to meet environmental flow needs, including strengthening the Water Trust, facilitating and encouraging market mechanisms, mitigation measures and voluntary conversions of water rights. The Flows Commission will explore options relating to private non-profit water trusts, with incentives for private investment, as a means to help protect environmental flows.