

**Brazos River and Associated Bay and Estuary System
Basin and Bay Stakeholder Committee (BBASC) Meeting
Wednesday, May 30, 2012 at 10:00 a.m.
Brazos River Authority Offices
Waco, Texas**

Minutes

Call to order

BBASC chair Dale Spurgin called the meeting to order. BBASC members introduced themselves.

Review of agenda & meeting goals

Facilitator Margaret Menicucci reviewed the meeting agenda and goals with the BBASC. No changes were made.

Public comment

Chris Wingert with West Central Texas Municipal Water District reiterated a point he made at the previous BBASC meeting in April, that the expert science team (BBEST) recommendations for high flow pulses and overbank flows may be somewhat high. He looked at USGS gage flows for the last four years at the Brazos River at South Bend gage and concluded that these historic flows have been less than the BBEST criteria. He recommended reducing the BBEST criteria to better reflect recent streamflow performance in the upper basin. He also used Hubbard Creek Reservoir Dam as an example that it would be very difficult if not impossible to release a high flow pulse or overbank flow through the dam. Mr. Wingert's comments and associated analyses are posted to the BBASC web page at http://www.tceq.texas.gov/permitting/water_rights/eflows/brazos-river-and-associated-bay-and-estuary-system-stakeholder-committee-and-expert-science-team.

Tyson Broad with the Sierra Club distributed a flyer for the Brazos Valley Water Conservation Symposium that will take place on June 21st in Waco. Brad Brunett with the Brazos River Authority (BRA) reminded everyone of the upcoming public meetings associated with the BRA System Operations Water Management Plan that is being developed.

Approval of April 24, 2012 meeting minutes

Tyson Broad questioned whether the statement "The WAM takes these diversions (exempt domestic and livestock) into account." was accurate. Gregg Easley (TCEQ) said he would check on it. The BBASC approved the minutes with any corrections that might come of the statement verification. Gregg later confirmed that the statement is correct.

Subcommittee updates

Funding/facilitation

BBASC vice-chair Tom Michel passed out an update of the contributions to the BBASC funds account administered by the fiscal agent, West Central Texas Council of Governments (WCTCOG). Over \$34,000 has been donated to date. A payment of \$7,200 was made to the facilitators to compensate for services rendered thus far, leaving a balance of \$27,416. If no more funds come in, this will cover the remaining meetings planned with a little extra left over. Some members said that additional funds should be forthcoming.

Report writing

Tom Conry, chair of the report writing subcommittee, said an activity report was sent out prior to the meeting and asked if there were any comments. None were given. Tom also mentioned that subcommittee member Cindy Bartos had the idea of each BBASC member providing a brief account of what the river means to them to incorporate into the report, so he encouraged everyone to write a short paragraph when they have time and submit it to him.

Technical analysis

Dale reported that the technical analysis group had a recent conference call which resulted in the agenda item slated for later in the meeting to discuss and identify analyses needed to develop environmental flow standard recommendations, and he emphasized the importance of identifying those analyses so that results could be brought back to the next meeting.

Discussion of steps for developing consensus

Facilitator Suzanne Schwartz gave a PowerPoint presentation on building consensus. The presentation has been posted to the BBASC web page.

Agree on BBASC responsibilities and goal

The facilitators provided a draft goal to the BBASC as a starting point for its development of a group goal, based on prior meeting discussions and their interviews with members. They noted that a goal is important because it expresses the desires of all members, something that the group can work toward, and something against which their decisions can be tested.

The BBASC discussed the draft, and noted the following regarding a goal statement:

- Conservation is important
- Human need and environmental need should not be separated in importance
- Environmental flows recommendations do not impact current water rights
- Human need is part of a sound ecological environment
- The environmental flow standards process is iterative and goes beyond the September 1, 2012 submittal of the BBASC environmental flow standards (EFS) recommendations. We can test our assumptions during this iterative phase.
- Fear about the impact of decisions in the future

Consensus:

The BBASC agreed by consensus to the following goal:

Create a set of environmental flow recommendations on which future water rights permits are considered that balances all water needs within the basin and that are understandable and are reasonable to implement.

Consider approach to developing the recommendations

The facilitators presented a draft flow-chart showing an approach to developing environmental flow standards. They noted that there is not a mandated way to develop the EFS, but that this chart was based on what they have seen work in prior basins and reviewing suggestions from the Science Advisory Committee. It provides an iterative approach to determining impacts of the BBEST environmental flow regime on hypothetical future projects or to adjust for other factors (such as ease of implementation or cost), making modifications to provide a balance if the BBASC feels adjustment is needed, and then evaluating modifications of any changes on a sound ecological environment (by asking the BBEST for assistance).

The BBASC asked that the flow chart be modified to reflect the development of strategies on an equal footing with environmental flow standards, and noted the places for modification. A revised chart is provided as Attachment 1.

The BBASC discussed “set asides.” These were defined as the amount of water for the environment that could be set aside from future permitting.

- Some members expressed a desire to provide a recommendation for a set-aside of environmental flows
- TCEQ has not found water reliably available for a set-aside except in wet conditions. TCEQ is, instead, planning to use special conditions in permits.

Report on the analysis of Double Mountain Fork and Allens Creek projects

At its last meeting, the BBASC choose two hypothetical projects for which it would like analysis conducted to show possible impacts of the BBEST environmental flow regime (EFR) on future project development, and the impacts of such projects on a sound ecological environment. A technical working group was formed to conduct such analysis. Brad Brunett of Brazos River Authority and Cindy Loeffler of Texas Parks and Wildlife Department (TPWD) presented the results of their analysis. (Slides of this presentation are available on the BBASC web page). The analysis provides a comparison of the reservoirs operating under both the Lyons method for imposing environmental flows (the current TCEQ default criteria) and with the BBEST EFR imposed. The following represents the discussion and questions and answers following the presentation:

- The impact of the BBEST EFR on the yield of the DMF reservoir is approximately 40 percent. The BBEST EFR scenario showed that the DMF reservoir did not refill during the drought, beginning in 1962, due primarily to the pulse requirements. The Lyons scenario showed the reservoir refilling but the reservoir was not full often. This is due to “flashy” hydrology i.e. relatively low flows punctuated by rainfall-induced peak events.
- The impact of the BBEST EFR on the yield of Allens Creek reservoir is approximately 5 percent. The impact of the EFR is less at Allens Creek primarily due to the less flashy nature of the streamflow and the fact that Allens Creek is an off-channel reservoir.
- What does the curve mean for a future permit applicant?
A: The curve indicates what water is available for permitting and what is being protected for environmental flows. Comparing the BBEST EFR to Lyons, water in pulses may be more restricted under EFR but more available during base flows. Cindy explained that TCEQ uses the Lyons method for smaller permits. Permits for large projects, such as reservoirs or the Systems Operation application, would include a more complex environmental flows analysis developed on a case-by-case basis.
 - Q: Clarify what TQEQ does with EFS:
A: TCEQ would consider EFS in water availability analysis for applications but this would not necessarily be put in a permit in that exact form.
 - Q: How is frequency of attainment applied? Is it a set number of years?
A: The frequency chart is based on the period of record. Frequency analysis demonstrates how often the components are being met. The BBASC can compare changes to frequency compliance if future changes to the EFR are made.
 - Q: How does TCEQ implement, for example, the three-per-season pulses?
A: If pulse (or base or subsistence) requirements are not met during a season, they do not have to be supplied in a later season.

Cedar Ridge Reservoir. Tommy O’Brien reported that Abilene has applied for a permit above Possum Kingdom reservoir to construct Cedar Ridge reservoir, and Cory Shockley with HDR Engineering presented information about that project and impacts of the EFR (Cory’s presentation is available on the BBASC web page):

- Imposition of the EFR would produce a 40% reduction in yield, nearly identical to the Double Mountain Fork project analysis.
 - The permit application uses an environmental flow regime that is different from BBEST. High flow pulses are imposed with less frequency and less volume. Hydrologic triggers are tied to pulses since fish spawning is cued by pulses.
 - This project is impacted more by lower pulse v. high pulse flow, in the 10% to 40% frequency range.
 - One member noted that analysis methods are different, so it may be an apples and oranges comparison.
- It was noted that west of Possum Kingdom, the hydrology is different from that occurring below Possum Kingdom. The upper basin experiences significant channel losses: 55% to 71% average losses in the upper basin to Possum Kingdom, and 14% average losses from Possum Kingdom to Rosharon.
 - As you move downstream, the Abilene project has less impact on the environmental flow regime, some less impact by Possum Kingdom and definitely by Waco.

- Whether a project is off-channel or on-channel is important to the impact of EFR on the project
- If environmental flow gets to Possum Kingdom, it will not be required to be passed further because of Possum Kingdom's existing rights.
- Subordination agreements also can impact.

Identify additional analysis needed to develop Environmental Flow Standard Recommendations

The BBASC discussed information it would like to consider for moving forward with EFS recommendations. Ideas included the following, with the options on which the group agreed noted:

- Flow that will be needed for shiner species in Upper Basin
- Review of Cedar Ridge analysis: how did they make their flow recommendations, especially pulses?
- Using different environmental flows for different areas of basin
- How releases of stored water might impact arrived-at values for base and subsistence – may be important to lower reaches
- Sediment transport analysis for Allens Creek and Double Mountain Fork projects
- Modified flow regime
- **Consensus:**
 - Develop additional analyses for Allens Creek and Double Mountain Fork projects using TCEQ rules proposed for the Colorado-Lavaca
 - Perform attainment frequency analysis for Allens Creek and Double Mountain Fork projects under all scenarios run (historical condition, WAM 3, Lyons, full BBEST, and Colorado rules)
 - Consider such analysis for two other gage reaches
- **Consensus:** Information on USGS hydrological classification of gages that BBEST currently is reviewing

Consider uses of Brazos River for other water needs: presentations from Regions G and H; discussion

Jason D. Afinowicz of Freese & Nichols presented information on Region H water needs; Cory Shockley of HDR presented information on Regions O and G water needs from the Brazos River Basin. (Slides for these presentations are available online).

Exchange of information on BBEST report including TPWD comments

Cindy Loeffler touched on the comments that TPWD submitted on the Brazos BBEST report. The comments have been posted to the BBASC web page.

Phil Price and Tiffany Morgan of the BBEST provided the following answers to BBASC questions:

- The Clear Fork of the Brazos is considered a sound ecological environment for generalist species. It may be helpful to review Appendix A and B of the BBEST report for more information. HEFR analyses were adjusted for low integrity streams to add additional seasonal pulses. It took three to four iterations to get there.
- Are stored water and deliveries incorporated in the recommendations of the BBEST?
 - HEFR analysis is based on gaged data, and so deliveries of water show up in the HEFR statistics, which do not separate out water that is released.
 - WAM flows will look different from gaged flow.
 - All BRA diversions are taken lakeside in WAM run 3. Impact would be seen more in base or subsistence than in pulse and higher flows.

Wrap up

Future meeting dates were briefly discussed, but these will be solidified at the end of tomorrow's meeting. Suzanne rehashed the meeting goals and the two major agenda items for tomorrow:

strategies and starting to make environmental flow recommendations. Margaret and Suzanne conducted a brief evaluation of the day's positives and things needing to be changed.

Public comment

None.

**Brazos River and Associated Bay and Estuary System
Basin and Bay Stakeholder Committee (BBASC) Meeting
Thursday, May 31, 2012 at 10:00 a.m.
Brazos River Authority Offices
Waco, Texas**

Minutes

Call to order

BBASC chair Dale Spurgin called the meeting to order.

Review of agenda & meeting goals

Suzanne Schwartz reviewed the day's agenda.

Public comment

None.

Develop environmental flow standard components

The BBASC discussion of base and subsistence flows moved between discussion of specific gages and general discussion that are applicable to the flows in general. The following recordation is grouped into a general discussion first, and then into discussion pertinent only to specific gages, and may not reflect the precise order of discussion during the meeting.

Base and subsistence flow: general discussion. BBEST member Phil Price provided information to the BBASC about different elements of the BBEST environmental flow regime recommendation, focusing primarily on base and subsistence flows. (Slides for this presentation are available on the BBASC web page.) The following reflects a summary of answers to BBASC questions following the presentation.

- The Palmer Hydrological Drought Index (PHDI) is not used to develop the base and subsistence flows. Those are developed using gage data. BBEST suggests using the PHDI to determine when a permit holder must operate under the EFS applicable to base dry, base average or base wet conditions; it acts like a trigger about when those conditions are present. The PHDI is available throughout the basin and tracks base flows consistently throughout the basin.
- Cindy Loeffler pointed out that two rare Texas endemic fish species, smallmouth shiner and sharpnose shiner, are found in the Double Mountain Fork Brazos. U.S. Fish and Wildlife Service is seeking input to determine if these species warrant protection as endangered species. If Endangered Species Act requirements later require more flows than the subsistence flows, EFS numbers could be revised by adaptive management. The Endangered Species Act is administered by U.S. Fish and Wildlife Service.
- EFS would not contain requirements to add flow if actual flows are less than EFS (e.g. through releases of stored water) to maintain the various subsistence or base flow levels. The BBASC could develop strategies for maintaining those flows, however.

- The BBEST report includes a chart that describes IHA parameters used to separate flows into subsistence, base, pulse and overbank flows. When the previous day's flow is a pulse or overbank flow, and the current day's flow is between the IHA minimum flow for a pulse flow and the maximum flow for a base flow, the day is classified as a base flow day if the flow decreases by less than 5%. The current day's flow will also be a base flow if it crosses the base flow threshold. (See pages 3-12 and 3-13, BBEST report).
- Responding to a question, Phil Price indicated he would not expect 2011 data, representing an extremely dry year, to change the recommendations of the BBEST because the Brazos includes data beginning in 1923, and the San Bernard beginning in 1955, both periods containing dry years. He noted that in the Brazos basin in general, dam releases probably dampen the impact of a very dry year. Also, the drought of record is normally included in the historical periods. In response to a question about whether this dampening impact is sustainable, he indicated it might not change what we do now, but could impact the future.

Consensus:

The BBASC agreed by consensus to note the following concept in its report:

The base and subsistence numbers recommended by the BBEST were derived from gauged flow statistics. In some areas, these historical gauged flows include releases of water from upstream reservoir storage that would not have been present under natural, pre-reservoir conditions, and are not guaranteed to be there in the future.

Fifty percent rule for implementation of base flow. The BBASC discussed a portion of the BBEST recommendation found in its report in Section 6.2 which reads as follows:

Under dry hydrologic conditions, if the mean daily streamflow is less than the seasonal base flow and greater than the subsistence flow, then 50 percent of the difference between streamflow and the recommended subsistence flow should be passed.

Under average and wet hydrologic conditions, if the mean daily streamflow is less than the seasonal base flow, then all streamflow must be passed, and none may be impounded or diverted.

The BBASC considered a possible approach of applying the 50% rule to all base flow conditions (dry, average and wet), rather than just to the dry base flow condition. Points of discussion included:

- Concern about ability to implement
- Impact on bank storage of moving out of wet base flows earlier.

TCEQ treatment of base flows in other basins: Kathy Alexander responded to questions for the BBASC about how TCEQ has treated base flows in other basins as a result of the SB3 process. She noted the following:

Eastern basins (Sabine-Neches, and Trinity-San Jacinto): TCEQ adopted rules that have one base flow and a subsistence flow.

Colorado-Lavaca: TCEQ has proposed rules for three tiers of base flow [for most gages] and a subsistence flow.

San Antonio basin: TCEQ has proposed rules for three tiers of base flows and one subsistence flow. There is a 50% rule related to base flows for the San Antonio and the San Antonio-Nueces Coastal basins.

Guadalupe basin: TCEQ has proposed rules with one level of base flow and a subsistence flow. There is a 50% rule related to base flows.

Base and subsistence flow: gage specific discussion. The following represents discussion by BBASC related to developing environmental flow standards for the various gages, beginning with the San Bernard at Boling gage, and then moving to the uppermost Brazos basin gage.

San Bernard River near Boling

Existing rights: Water used by Conoco Phillips is an existing right, and not impacted. Future needs: There were no immediately known new appropriation requests. Although Conoco-Phillips will expand operations, their need for more water beyond their current right is not known.

The BBASC considered the question of whether to use the BBEST numbers for subsistence and base flows.

- BBASC members considered using one base flow to simplify. Risks were identified both from an environmental and water supply perspective: not taking into account drier and varied periods, both to provide environmental flow and also to allow water to be captured more often for use during dry periods.
- In response to a question about what gage would be used in making specific permitting decisions if a project were not actually located at a specific gage (e.g. it was upstream or downstream a distance, or was on a tributary), Kathy Alexander of TCEQ noted the agency generally uses the closest gage as a starting point for imposing an environmental condition, and then may adjust the numbers to a gage closer to the diversion point of the permit application by using techniques such as drainage area ratios. She also noted that EFS generally would be used in the agency's analysis for water permitting unless exceptions were included in the EFS rules adopted by TCEQ. The EFS will apply to all permits for new appropriations that are pending after adoption of the EFS. As an example, an exception could be that smaller users were exempt from pulse requirements. Or another one could be that small users with diversion rates less than 20% of a pulse flow trigger level were exempt from that pulse. But those small users would still be subject to the remaining standards and would have some type of EFS in their permit.

Consensus: The BBASC agreed by consensus to use the BBEST numbers for the San Bernard River near Boling for subsistence and base flows.

Double Mountain Fork Brazos River near Aspermont

Discussing the project analysis by the technical work group, it was noted that the BBEST EFR impacted yield for the hypothetical Double Mountain Fork project primarily through its pulse flow recommendations, not through the base and subsistence flow recommendations.

Noting there was not a large difference in some of the lower base flow numbers and subsistence numbers, the BBASC considered the possibility of simplifying the base flows, including the following discussion:

- In response to a question about whether the small difference between the dry base flow and subsistence flow in the BBEST recommendations was important from a biological perspective, Phil Price noted that the numbers are statistically derived, and are based on the idea that a regime should replicate the varied levels of flow that have occurred naturally. It also was mentioned that the BBEST and SAC both recommend a varied flow regime. The question was raised about whether the statistically based numbers were sufficiently connected to biology.
- The statutory definition of a flow regime was noted: *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.*
- The importance of the difference in 1 or 2 cfs (BBEST recommendations for dry and average base flow in the summer): Cindy Loeffler with TPWD noted that while this difference seems small, it is a difference of 100%, and reflects the hydrology at that gage. She noted that base flows provide habitat.

- Consider modification to make an EFS easier to implement, since differences not significant in flows that are so low

Ability to group gages for consideration of EFS

The BBASC expressed some concern about making decisions for one gage on the Brazos that might then be applied, perhaps inappropriately, to other gages. Members also expressed an interest in characterizing gages for the purpose of considering decisions that might be made similarly for that group. Mark Wentzel of the Texas Water Development Board provided information on characterization of gages by the USGS, which examined gages across the state and divided them into four categories based on their hydrologic characteristics. In 2007, the USGS developed a classification of rivers and streams in Texas based on a modified version of their Hydrologic Assessment Tool (TXHAT). Using that tool, the USGS identified 4 types of streams/rivers in Texas which they named "Intermittent Flashy," "Intermittent Stable," "Perennial Flashy," and "Perennial Stable." There is a lot more to the classification than just "flashiness" but effectively, in applying it to a large river basin, it does partition the basin into upper and lower (similar to "flashy" and "less-flashy") portions of the watershed. Gages in the Brazos basin break down as follows: (numbers for gages reflects numbering system in Figure 1.1 of the BBEST report). *(Note: This information has been supplemented with additional information from Mark Wentzel provided after the BBASC meeting):*

Flashiest - "Intermittent Flashy" (Category 1):

1. Double Mountain Fork Brazos River near Aspermont
2. Salt Fork Brazos River near Aspermont
4. Clear Fork Brazos River at Nugent
5. Clear Fork Brazos River at Fort Griffin
6. Brazos River near South Bend

Flashy - "Intermittent Stable" (Category 2)

3. Brazos River at Seymour
7. Brazos River near Palo Pinto
9. North Bosque River near Clifton
11. Leon River at Gatesville
12. Lampasas River near Kempner
13. Little River near Little River
14. Brazos River near Cameron
17. Navasota River near Easterly
21. San Bernard River near Boling

Less Flashy – “Perennial Flashy” (Category 3)

8. Brazos River near Glen Rose
10. Brazos River at Waco

Least Flashy – “Perennial Stable” (Category 4)

15. Brazos River at SH 21 near Bryan
18. Brazos River near Hempstead
19. Brazos River at Richmond
20. Brazos River near Rosharon

Consensus: Category 1 gages

For hydrologic category 1 gages (Double Mountain Fork Brazos River near Aspermont, Salt Fork Brazos River near Aspermont, Clear Fork Brazos River at Nugent, Clear Fork Brazos River at Fort Griffin, Brazos River near South Bend), the BBASC agreed to the following by consensus:

- use the BBEST recommendation for base and subsistence flows, including using the BBEST 50% implementation rule applied to base dry conditions.

- note that there will be times when the stream flow is less than the 1 cfs adopted for subsistence flow

Continuing discussion: Members also expressed concern about the availability of water for small users, especially during wet flow conditions. More information will be provided, and the matter discussed at the June meeting.

Category 2 gages:

The BBASC initially began a general discussion of Category 2 gages (Brazos River at Seymour, Brazos River near Palo Pinto, North Bosque River near Clifton, Leon River at Gatesville, Lampasas River near Kempner, Little River near Little River, Brazos River near Cameron, Navasota River near Easterly, and San Bernard River near Boling):

- Seymour would be categorized as a category 1 gage from the 1925 to 1967 period, but has moved to a category 2 based on hydrologic conditions between 1968 and 2006
- Some gages are regulated flow sites, or managed sites, in that they are impacted by upstream reservoirs. The BBASC discussed whether to consider these gages differently. They include:
 - 11 Leon River at Gatesville (downstream of Proctor Reservoir)
 - 7 Brazos River near Palo Pinto (between Possum Kingdom and Granbury)
Hydropower use from Possum Kingdom has ceased. BRA is operating Possum Kingdom and Granbury in coordination. BRA doesn't expect the same flows now that hydropower releases are eliminated. The releases are expected to look similar to, but higher, than Brazos River near South Bend, a category 1 gage.
 - 9 North Bosque River at Clifton Quality has improved. It looks more like the San Bernard at Boling than a mainstream gage. Historically it goes out of bank one to two times a year.

The BBASC then discussed whether it was time-effective to attempt to develop EFS for all category 2 gages at once, since it required a comparison and analysis of gage sites against each other. Members then decided to develop recommendations one at a time for each of the category 2 gages.

Brazos River at Seymour

Consensus:

The BBASC agreed to use the same recommendation as the category 1 gages, including looking at small users and how to protect them.

Brazos River near Palo Pinto

This gage is located downstream of Possum Kingdom. BBASC discussed whether to adopt the BBEST recommendation, including the 50 percent implementation rule. The BBASC discussed issues including changed circumstances, possible projects and other needs for the water, as well as providing enough water for the environment. The following were points of discussion:

- Possum Kingdom releases: Past hydropower releases could be approximately 3000 cfs several times a day, but for a short duration, resulting in an average of a few hundred cfs total each day. Even with hydropower decommissioned, minimum releases must be made, although they are lower than the releases under the hydropower regime. The minimum release requirement varies by season. Maximum release requirement is 100 cfs; minimum release is the lesser of 25 cfs or inflow to the reservoir. The BRA releases will satisfy most of the EFS. While these releases are not necessarily available for future permits since BRA may be sending them downstream for storage or use by customers, they would benefit future permit holders since they would count toward satisfying any EFS that h are set. Phil Price indicated that the minimum flow requirements would remain in effect after the hydropower decommissioning.

- The FERC license requirements are similar to the BBEST EFR for base flows. BRA has made a commitment to honor the FERC minimum flow requirements even after decommissioning.
- Future rights that could be impacted by an EFS set for this reach:
 - power generation if the system operation permit is denied and Luminant files a new application;
 - possibly Turkey Peak's pending application. The technical review is not complete on this, and there is uncertainty how the Palo Pinto gage would be used relative to that project;
 - any future permit applications between Possum Kingdom and Granbury, although there is little chance that a new permit will be possible unless it includes storage.
- Flow numbers in this area historically have been higher than expected.
- Try to aim for good EFS and use strategies if needed.
- Goals need to be realistic.
- Base and subsistence numbers are comparable with other gages.
 - But, a concern was noted that the numbers at this gage could be artificially high: the Glen Rose gage downstream, which logically would gain flow, has lower subsistence numbers than Palo Pinto. EFS should reflect reality.
- Concern over golden algae. Flows are needed to control it, and current levels of releases (50 cfs) are not sufficient.
 - But the solution to control golden algae is not conclusive. Golden algae can't be controlled with base flows, but rather with pulse flows.

The BBASC agreed to revisit base and subsistence flows for this gage at the next meeting, with additional data, including

- Turkey Peak information.
- Whether water was available here for permitting
- If the 50% implementation rule is applied to all levels of base flow, at this gage and downstream, would a sound ecological environment (SEE) environment be impacted?

Education and discussion on how to develop strategies to meeting environmental flow standards

Caroline Runge of the Menard Underground Water District, briefed the group about strategy development for the Colorado-Lavaca BBASC, and presented an overview of the strategies that BBASC developed. (Slides for this presentation are available on the BBASC web page). Following the presentation, BBASC members engaged in a question and answer session and discussion with Caroline, and the following points are noted:

- The Trans-Pecos Water and Land Trust has received funding from donations from various environmental foundations, and approval to receive a portion of local TCEQ fines. Brush control recommendations include controlled burns
- Brush control as a strategy is supported by a report on the North Concho
- Postponing agriculture use may be negatively impacted by crop insurance. Trans-Pecos Water and Land Trust generally works with agricultural producers that do not have crop insurance.
 - Texas Parks and Wildlife Department indicated that while new water right permits cannot be issued for instream uses, existing permits can be amended to include instream uses. This is typically considered a minor amendment.

Consensus

The BBASC agreed to form a subcommittee to work on strategies development consisting of the following BBASC members:

Matt Phillips (chair), Tommy O'Brien, Gena Leathers, Brian Hays, Horace Grace.

Wrap up

The following items reflect information the BBASC generated during the May 30-31 meeting that are captured for future use and consideration:

Work Plan: Items that might be considered when developing the work plan

- Additional studies for the area from Possum Kingdom to Whitney, including the golden algae issue
- Develop a schedule for review of environmental flow standards

Report

Include in the report the following:

- A statement that BBASC recommendations are based on an understanding that it affects future permitting only
- Goal
- Technical analysis requested

June Agenda

Include the following in the June agenda

- Small users
- Set asides
- Technical analysis of projects
- Base & subsistence
 - Implementation rules in BBEST 6.1 and 6.2
- Pulse
- Strategies
- Report language
- Hydrologic triggers for base flow levels

Parking Lot (to be reviewed for possible later discussion)

Consider whether to do sediment transport analysis of modified regime at the June meeting after project modifications

Future meeting dates

June 27 & 28

July 17, July 30-31 (City of Waco or Texas Farm Bureau)

August 15-16

August 29

Action Item List

Action	Who	When
Project analysis: <ul style="list-style-type: none">• Develop additional analyses for Allens Creek and Double Mountain Fork projects using TCEQ rules proposed for the Colorado-Lavaca• Perform attainment frequency analysis for Allens Creek and Double Mountain Fork under all scenarios• Consider the ability & desirability to perform such analysis for two other gage reaches	Technical work group	Distribute prior to June meeting
Draft report language on base and subsistence decisions on Category 1 gages	Lloyd	Distribute prior to June meeting
Information on small users <ul style="list-style-type: none">• What did prior BBASCs do to exempt or modify conditions for small permits, and at what size	Facilitators	Distribute prior to June meeting

<ul style="list-style-type: none"> Information on Palo Pinto 	TCEQ	
<p>BBEST questions:</p> <ul style="list-style-type: none"> Appropriateness from the perspective of a SEE of using USGS classification of flashiness as a factor to consider in treating gage locations similarly. The impact on a SEE of applying the 50% implementation rule found in Section 6.2 of the BBEST report to all levels of base flow, rather than just to dry base flow conditions at Palo Pinto gage and below. Impact on SEE of changing the subsistence flow for the Brazos River at Palo Pinto gage to a lower number because of hydropower decommissioning at Possum Kingdom dam. Response to previous Golden Algae question 	BBEST	Distribute prior to June meeting

What went well	What to change
Cookies Moved forward Good discussion Two-day meeting: <ul style="list-style-type: none"> Helped momentum Saved travel time Rain Good dinner Summaries by facilitators Cards	Consider subcommittee work if not making progress

Public comment

None.

Adjourn

- (1) The BBASC is charge to develop recommendations for environmental flow standards and strategies to meet environmental flow standards in Texas Water Code Section 11.02362 (o):

Each basin and bay area stakeholders committee shall review the environmental flow analyses and environmental flow regime recommendations submitted by the committee's basin and bay expert science team and shall consider them in conjunction with other factors, including the present and future needs for water for other uses related to water supply planning in the pertinent river basin and bay system. {Language related solely to Rio Grande basin is omitted} The basin and bay area stakeholders committee shall develop recommendations regarding environmental flow standards and strategies to meet the environmental flow standards and submit those recommendations to the commission and to the advisory group in accordance with the applicable schedule specified by or established under Subsection (c), (d), or (e). In developing its recommendations, the basin and bay area stakeholders committee shall operate on a consensus basis to the maximum extent possible.

- (2) The BBEST is charged, in Water Code Section 11.02362 (m) to

*. . . develop **environmental flow analyses** and a recommended **environmental flow regime** for the river basin and bay system for which the team is established through a collaborative process designed to achieve a consensus. In developing the analyses and recommendations, the science team must consider all reasonably available science, without regard to the need for the water for other uses, and the science team's recommendations must be based solely on the best science available. . . . (Emphasis added)*

The terms noted in bold are defined in Texas Water Code 11.002 as follows:

(15) "Environmental flow analysis" means the application of a scientifically derived process for predicting the response of an ecosystem to changes in instream flows or freshwater inflows.

(16) "Environmental flow regime" 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.

- (3) Choose hypothetical projects to assess how application of BBEST EFR may affect water supply. Hypothetical projects are used as illustrative to evaluate how potential environmental flow recommendations may impact water supply potential and flows in the basin. The Brazos BBASC has chosen one project in the upper basin and one project in the lower basin to represent different conditions in the basin, thereby providing a way to see differing impacts without having to conduct such analyses on multiple potential projects or gauge locations. Using projects will allow iterative modeling to occur: first to see the impacts of the BBEST EFR on the hypothetical projects, then to see how any modifications to the EFR would impact the project as well as a sound ecological environment.

- (4) Gauges: Selecting at what gauges (or measurement points as TCEQ refers to them in their rules) to develop environmental flow standards. The immediate past two BBASCs have provided EFR for all gauges from the BBEST report, and the TCEQ has adopted EFS for all such gauges. The Brazos BBEST has recommended using all gauges. The BBASC is free to modify the BBEST gauge recommendations, but documentation of the reasons for such change is suggested to provide TCEQ with an understanding of the reasons.

Other factors: The BBASC is charged with considering the BBEST EFR in conjunction with other factors, including present and future needs for water for other needs. The project analysis provides one way to consider needs for the water for other uses. The BBASC is free to choose additional factors to consider, and has informally discussed some, including

- cost;
- ease of implementation;
- concerns over selecting flows that will cause flooding .

(5) Consider modifying EFR. The BBASC may modify the BBEST's environmental flow regime recommendations for any number of reasons {see note (4)}. Modifications may include changes to lessen the impact on water supply. This may be done by modifying the flow components, by exempting certain small permits from some of the EFR components (such as pulse flow components) etc.

(6) Environmental flow strategy development is not illustrated on this chart. Strategies are developed to provide for achievement of the recommended environmental flow standards. The Science Advisory Committee notes about strategies:

The environmental flow standards recommendations will depend both on (hydrologic) analyses ...and on consideration and evaluation of what strategies might be used to ensure that achievement of the recommended flow standards is not impaired.

SB 3 does not set out specific terms for the development of strategies, so the BBASCs have broad leeway to examine potential avenues for implementing flow standards. For example, they could agree to analyze how changes in operation of major reservoirs, dry-year leasing of water rights, dedication of return flows, or other strategies can be used to help meet standards.

Science Advisory Committee, Discussion Paper: *Moving from Instream Flow Regime Matrix Development to Environmental Flow Standard Recommendations*, February 16, 2010