TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
INTEROFFICE MEMORANDUM

TO: Chief Clerk DATE: April 9, 2010

THRU: Iliana Delgado, Team Leader
Water Rights Permitting Team

FROM: Ron Ellis, Project Manager
Water Rights Permitting Team

SUBJECT: Brazos River Authority
Docket No. 2005-1490-WR
WRPERM 5851
CN600506794, RN104319736
Application No. 5851 for a Water Use Permit
Texas Water Code (TWC) §§ 11.121, 11.042 & 11.085, Requiring Mailed and Published Notice
Multiple Tributaries of the Brazos River and the Brazos River, Brazos River Basin, Trinity River Basin, Red River Basin, Colorado River Basin, San Jacinto-Brazos Coastal Basin, and Brazos-Colorado Coastal Basin
Multiple Counties

The Executive Director received an application from Brazos River Authority seeking a Water Use Permit pursuant to TWC §§ 11.121, 11.042 and 11.085, and Texas Commission on Environmental Quality Rules 30 Texas Administrative Code (TAC) §§ 295.1, *et seq.*

The application was received on June 25, 2004. The application was declared administratively complete and filed with the Office of the Chief Clerk on October 15, 2004. Notice of the application was mailed by the Chief Clerk to the water right holders in the Brazos River Basin on April 22, 2005. Notice of the application was published in 27 newspapers between May 10 and May 13, 2005. A public meeting was held in Waco, Texas on May 17, 2005. Several requests for a contested case hearing were received.

Because this application was declared administratively complete after September 1, 1999, the rules in Chapter 55, Subchapter G, Section 55.250 - 55.256 apply. The Chief Clerk shall mail notice to the applicant, executive director, public interest counsel, and timely hearing requestors not later than 35 days prior to the agenda setting. Applicants, the public interest counsel, and the executive director shall file a response no later than 23 days before agenda, and the hearing requestors shall reply no later than nine days before agenda.

The application is now technically complete and the staff has recommended that the application be granted based on the analysis in the technical review memos.

Below is the caption for this application:

Consideration of an application by the Brazos River Authority (BRA) for a new permit to authorize a new appropriation of state water in the amount of 421,449 acre-feet per year, which includes existing and future return flows in the basin for multiple uses including domestic, municipal, agricultural, industrial, mining, and other beneficial uses on a firm basis in the Brazos River Basin. BRA currently owns the water rights and reservoirs authorized by Certificate of Adjudication (Certificate) No. 12-5155 (Possum Kingdom Lake), Certificate No. 12-5156 (Lake Granbury), Certificate No. 12-5165 (Lake Limestone), and Water Use Permit No. 2925A (Allens Creek Reservoir in conjunction with the Texas Water Development Board and the City of Houston), and owns the water rights and has contracts with the United States Army Corps of Engineers for storage authorized by Certificate No. 12-5157 (Lake Whitney), Certificate No. 12-5158 (Lake Aquilla), Certificate No. 12-5159 (Lake Proctor), Certificate No. 12-5160 (Lake Belton), Certificate No. 12-5161 (Lake Stillhouse Hollow), Certificate No. 12-5162 (Lake Georgetown), Certificate No. 12-5163 (Lake Granger), Certificate No. 12-5164 (Lake Somerville), and the water rights authorized by Certificates Nos. 12-5166 and 12-5167, which authorize various uses of water within the BRA's other certificates and permits, and is currently authorized, pursuant to the 1964 System Operation Order, as amended, to manage and operate its tributary reservoirs as elements of a system, coordinating releases and diversions from the tributary reservoirs with releases and diversions from BRA's mainstem reservoirs to minimize waste, and to conserve water in reservoirs in which the supply is short by making releases from tributary reservoirs in which the supply is more abundant.

BRA also requests diversion of the water authorized by this permit, if granted, from: (i) the existing diversion points authorized by BRA's existing water rights; (ii) the Brazos River at the USGS Gage No. 08091000 near Glen Rose, Texas; (iii) the Brazos River at USGS Gage No. 08098290 near Highbank, Texas; (iv) the Brazos River at the Gulf of Mexico; and (v) at such other diversion points that may be identified and included in BRA's proposed Water Management Plan which is subject to TCEQ's approval. Additionally, BRA requests use of up to 90,000 acre-feet of water per year of its firm supply (part of the 421,449 acre-feet of firm water requested above) to produce, along with other unappropriated flows, an interruptible water supply of 670,000 acre-feet per year and the appropriation of that interruptible water supply; an exempt interbasin transfer authorization to transfer and use, on a firm and interruptible basis, such water in the adjoining San Jacinto-Brazos Coastal Basin and the Brazos-Colorado Coastal Basin, and to transfer such water to any county or municipality or the municipality's retail service area that is partially within the Brazos River Basin for use, on a firm and interruptible basis, in that part of the county or municipality and the municipality's retail service area not within the Brazos River Basin. Other conditions will apply, including special conditions that will apply until Allen's Creek Reservoir is built.

BRA's service area includes the following counties: Parmer, Castro, Swisher, Bailey, Lamb, Hale, Floyd, Cochran, Hockley, Archer, Lubbock, Crosby, Baylor, Dickens, King, Knox, Jack, Terry, Lynn, Mitchell, Chambers, Young, Garza, Throckmorton, Kent, Haskell, Stonewall, Parker, Palo Pinto, Dawson, Scurry, Borden, Fisher, Stephens, Jones, Shackelford, Johnson, Hood, Nolan, Erath, Eastland, Taylor, Callahan, Somervell, Hill, Comanche, Bosque, Brown, Freestone, Hamilton, McLennan, Limestone, Mills, Coryell, Leon, Falls, Lampasas, Robertson,

Bell, Madison, Milam, Burnet, Brazos, Grimes, Williamson, Burleson, Travis, Lee, Washington, Bastrop, Fayette, Waller, Harris, Austin, Colorado, Fort Bend, Galveston, Matagorda, Wharton, and Brazoria.

The commission will consider the application and hearing requests and responses to those requests. (Robin Smith, Ron Ellis)

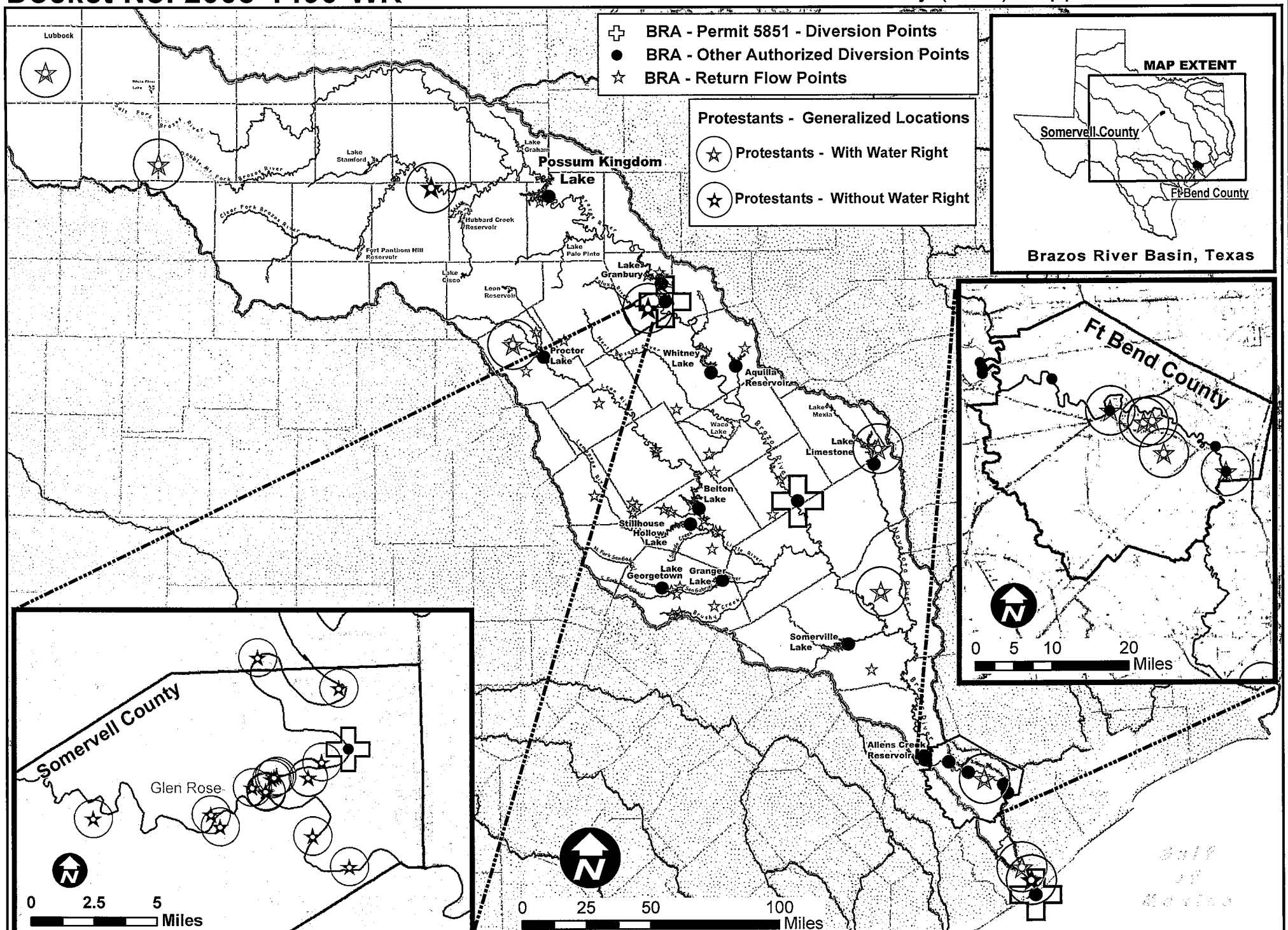
Ron Ellis, Project Manager
Water Rights Permitting Team

Enclosure

cc: Linda Brookins, TCEQ
Steve Ramos, TCEQ
Kellye Rila, TCEQ
Chris Loft, TCEQ
Kristin Wang, TCEQ
Paul Geeslin, TCEQ
Robin Smith, TCEQ
Kathy Alexander, TCEQ
Iliana Delgado, TCEQ

Docket No. 2005-1490-WR

Brazos River Authority (BRA) - Application No. 5851



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

NOTICE OF AN APPLICATION TO APPROPRIATE STATE WATER

APPLICATION NO. 5851

SUMMARY. The Brazos River Authority has applied for a permit, designated its "System Operation Permit", to authorize: 1) appropriation of state water for multiple use purposes; 2) appropriation of current and future return flows; 3) an exempt interbasin transfer of the water requested; 4) operational flexibility; 5) recognition that the System Operation Permit will prevail over inconsistent provisions in its existing water rights; and 6) the use of the bed and banks of the Brazos River, its tributaries, and BRA's reservoirs for the storage, conveyance and subsequent diversion of state water appropriated pursuant to this application and from other sources. More information on the application and how to participate in the permitting process is given below.

PUBLIC COMMENT / PUBLIC MEETINGS. The TCEQ will hold a public meeting to receive comments on the application filed by the Brazos River Authority. The public meeting will consist of two parts, an Informal Discussion Period and a Formal Comment Period. During the Informal Discussion Period, the public is encouraged to ask questions of the applicant and TCEQ staff concerning the application, but comments made during the Informal Discussion Period will not be considered by the Commissioners before reaching a decision on the application and no formal response will be made. During the Formal Comment Period, members of the public may state their comments into the official record. The Executive Director will summarize the formal comments and prepare a written response. The written response will be considered by the Commissioners in their decision-making process and upon request will be available to the public.

Public Meeting is to be held:
Tuesday, May 17, 2005 at 7:00 p.m.
Brazos River Authority Headquarters
4600 Cobbs Drive
Waco, Texas 76714

Citizens are encouraged to submit written comments anytime during the meeting or by mail before the meeting to the Office of the Chief Clerk, TCEQ, MC 105, P.O. Box 13087, Austin, Texas, 78711-3087. If you need more information, please call the TCEQ Office of Public Assistance, toll free at 1-800-687-4040.

APPLICATION. The Brazos River Authority (BRA), P.O. Box 7555, Waco, Texas 76714-7555, applicant, seeks a permit to appropriate state water pursuant to Texas Water Code (TWC) §§ 11.121, 11.042, and 11.085(v), and Texas Commission on Environmental Quality (TCEQ) Rules 30 Texas Administrative Code (TAC) §§ 295.1 et seq. and 30 TAC § 297.1 et seq. Published and mailed notice of the application is given to the water rights owners of record in the Brazos River Basin pursuant to 30 TAC § 295.151.

The BRA owns the following water rights, which comprise BRA's system of reservoirs for the purposes of this application: Certificate of Adjudication (Certificate) No. 12-5155 (Possum Kingdom Lake), Certificate No. 12-5156 (Lake Granbury), Certificate No. 12-5165 (Lake Limestone), Certificate No. 12-5157 (Lake Whitney), Certificate No. 12-5160 (Lake Belton), Certificate No. 12-5159 (Lake Proctor), Certificate No. 12-5164 (Lake Somerville), Certificate No. 12-5161 (Lake Stillhouse Hollow), Certificate No. 12-5163 (Lake Granger), Certificate No. 12-5162 (Lake Georgetown) and Certificate No. 12-5158 (Lake Aquilla). The BRA, along with the Texas Water Development Board and the City of Houston, owns Water Use Permit 2925A (Allens Creek Reservoir). The BRA also owns Certificate Nos. 5166 and 5167, which authorize various uses of water within the applicant's other certificates and permits.

The applicant is currently authorized, pursuant to a TCEQ order, to manage and operate its tributary reservoirs as elements of a system, coordinating releases and diversions from the tributary reservoirs with releases and diversions from the applicant's main-stem reservoirs to minimize waste, and to conserve water in reservoirs in which the supply is short by making releases from tributary reservoirs in which the supply is more abundant.

The applicant seeks a Water Use Permit to authorize:

- A new appropriation of state water in the amount of 421,449 acre-feet per year for multiple use purposes, including domestic, municipal, agricultural, industrial, mining, and other beneficial uses on a firm basis in the Brazos River Basin. The amount of this new appropriation of water includes the current and future return flows requested in this application. BRA indicates that the entire amount of 421,449 acre-feet of water per year is available only if all of it is diverted at the mouth of the Brazos River, and can only be made available by the BRA through the system operation of its water rights. To the extent water is diverted upstream, the remaining unappropriated water downstream is reduced and will itself vary depending upon the location of its diversion and use. Out of the 421,449 acre-feet per year of unappropriated water being requested, the maximum amount of unappropriated water that will be available if such water is diverted upstream at USGS gage No. 08091000 near Glen Rose, Texas is 150,538 acre-feet per year firm, and if such unappropriated water is diverted upstream at USGS gage No. 08098290 near Highbank, Texas, the maximum amount of unappropriated water that will be available at that location is 144,306 acre-feet pre year firm.

- Diversion of the water authorized by this amendment, if granted, from: (i) the existing diversion points authorized by BRA's existing water rights; (ii) the Brazos River at the USGS gage No. 08091000 near Glen Rose, Texas; (iii) the Brazos River at USGS gage No. 08098290 near Highbank, Texas; (iv) the Brazos River at the Gulf of Mexico; and (v) at such other diversion points that may be identified and included in BRA's proposed Water Management Plan which is subject to TCEQ's approval.

- Use of up to 90,000 acre-feet of water per year of its firm supply (part of the 421,449 acre-feet of firm water requested above) to produce, along with other unappropriated flows, an interruptible water supply of 670,000 acre-feet per year and the appropriation of that interruptible water supply. BRA indicates that the entire amount of 1,001,449 acre-feet of water (331,449 acre-feet of firm water and 670,000 acre-feet of interruptible water) is available only if all of it is diverted at the mouth of the Brazos River, and can only be made available by the BRA through the system operation of its water rights. To the extent water is diverted upstream, the remaining unappropriated water downstream is reduced and will itself vary depending on the location of its diversion and use. This new appropriation of water includes the current and future return flows requested in this application. Out of the 1,001,449 acre-feet of firm and interruptible water being requested, the maximum amount of firm and interruptible water that will be available if such water is diverted upstream at USGS Gage No. 08091000 near Glen Rose, Texas is 60,538 acre-feet of firm water per year and 157,000 acre-feet of interruptible water per year and if such water is diverted upstream at USGS Gage No. 08098290 near Highbank, Texas, the maximum amount of firm water is 54,306 acre-feet of water per year and 303,000 acre-feet of interruptible water per year.

- An exempt interbasin transfer authorization to transfer and use, on a firm and interruptible basis, such water in the adjoining San Jacinto-Brazos Coastal Basin and the Brazos-Colorado Coastal Basin, and to transfer such water to any county or municipality or the municipality's retail service area that is partially within the Brazos River Basin for use, on a firm and interruptible basis, in that part of the county or municipality and the municipality's retail service area not within the Brazos River Basin.

- An appropriation of current and future return flows (treated sewage effluent and brine bypass/return) to the extent that such return flows continue to be discharged or returned into the bed and banks of the Brazos River, its tributaries, and applicant's reservoirs. BRA indicates that such appropriation of return flows would be subject to interruption by direct use or indirect use within the discharging entity's city limits, extraterritorial jurisdiction, or contiguous water certificate of convenience and necessity boundary. Specified discharge points and amounts of water will be accounted for on a monthly basis as part of BRA's Water Management Plan which is subject to TCEQ's approval.

- Operational flexibility to (1) use any source of water available to the applicant to satisfy the diversion requirements of senior water rights to the same extent that those water rights would have been satisfied by passing inflows through the applicant's reservoirs on a priority basis; and (2) release, pump and transport water from any of the applicant's reservoirs for subsequent storage, diversion and use throughout the applicant's service area.

- Recognition that the System Operation Permit approved pursuant to this application will prevail over inconsistent provisions in the applicant's existing water rights regarding system operation.

- Use of the bed and banks of the Brazos River, its tributaries and the applicant's reservoirs for the conveyance, storage, and subsequent diversion of (i) water that the applicant seeks to appropriate under this application; (ii) waters that are being conveyed via pipelines and subsequently discharged into the Brazos River, its tributaries or stored in the applicant's reservoirs; (iii) surface water imported from areas located outside the Brazos River Basin for subsequent use; (iv) in-basin surface water and groundwater subject to the applicant's control;(v) waters developed from future applicant projects; and (vi) current and future reuse of surface and groundwater based effluent requested by this application. This bed and banks authorization is subject to applicant, after identifying specific points of discharge and diversion and conveyance and other losses, obtaining future authorizations to satisfy the requirements of TWC § 11.042. Such points of discharge and diversion and conveyance and other losses may also be identified and included in BRA's proposed Water Management Plan which is subject to TCEQ's approval.

Until the construction of Allens Creek Reservoir is completed, the applicant requests that the System Operation Permit include special conditions which authorize:

- The applicant to appropriate state water in the amount of 425,099 acre-feet per year for multiple use purposes, including domestic, municipal, agricultural, industrial, mining, and other beneficial uses on a firm basis in the Brazos River Basin. This amount includes the current and future return flows requested in this application. This amount is available if all of the water is diverted at the mouth of the Brazos River, and can only be made available by the BRA through the system operation of its water rights. To the extent water is diverted upstream, the remaining unappropriated water downstream is reduced and will itself vary depending upon the location of its diversion and use. Out of the 425,099 acre-feet per year of unappropriated water being requested, the maximum amount of unappropriated water that will be available if such water is diverted upstream at USGS Gage 08091000 near Glen Rose, Texas is 150,538 acre-feet per year firm and if such unappropriated water is diverted upstream at USGS Gage 08098290 near Highbank, Texas the maximum amount of unappropriated water that will be available is, at that location, 175,306 acre-feet per year firm;

- The applicant to use up to 90,000 acre-feet of water per year of its firm supply to produce, along with other unappropriated flows an interruptible water supply of 869,000 acre-feet per year. This amount includes the current and future return flows requested in this application. BRA indicates that the entire amount of 1,204,099 acre-feet of water (335,099 acre-feet of firm water and 869,000 acre-feet of interruptible water) is only available if all of it is diverted at the mouth of the Brazos River, and can only be made available by the BRA through the system operation of its water rights. To the extent water is diverted upstream, the remaining unappropriated water downstream is reduced and will itself vary depending upon the location of its diversion and use. Out of the the 1,204,099 acre-feet of firm and interruptible water being requested, the maximum amount of firm and interruptible water that will be available if such water is diverted upstream at USGS Gage No. 08091000 near Glen Rose, Texas, will be 60,538 acre-feet of firm water per year and 190,000 acre-feet of interruptible water per year and if such water is diverted upstream at USGS Gage No. 08098290 near Highbank, Texas the maximum amount of firm water will be 85,306 acre-feet of water per year and 284,000 acre-feet of interruptible water per year; and

- Exempt interbasin transfer authorization to transfer and use, on a firm and interruptible basis, such water in the adjoining San Jacinto-Brazos Coastal Basin and the Brazos-Colorado Coastal Basin, and to transfer such water to any county or municipality or the municipality's retail service area that is partially within the Brazos River Basin for use, on a firm and interruptible basis, in that part of the county or municipality and the municipality's retail service area not within the Brazos River Basin.

This application is subject to the Texas Coastal Management Program (CMP) and must be consistent with the CMP goals and policies.

The TCEQ will review the application as submitted by the applicant and may or may not grant the application as requested.

The application was received on June 25, 2004, and additional information was received on October 8 and October 12, 2004. The application was declared administratively complete and accepted for filing on October 15, 2004.

CONTESTED CASE HEARING. The TCEQ may grant a contested case hearing on this application if a written hearing request is filed within 30 days from the date of newspaper publication of this notice. The Executive Director may approve the application unless a written request for a contested case hearing is filed within 30 days after newspaper publication of this notice.

To request a contested case hearing, you must submit the following: (1) your name (or for a group or association, an official representative), mailing address, daytime phone number, and fax number, if any; (2) applicant's name and permit number; (3) the statement "[*I/we*] request a contested case hearing;" (4) a brief and specific description of how you would be affected by the application in a way not common to the general public; and (5) the location and distance of your property relative to the proposed activity. You may also submit your proposed adjustments to the application/permit which would satisfy your concerns. Requests for a contested case hearing must be submitted in writing to the Office of the Chief Clerk at the address provided in the information section below.

If a hearing request is filed, the Executive Director will not issue the permit and will forward the application and hearing request to the TCEQ Commissioners for their consideration at a scheduled Commission meeting.

INFORMATION. Written hearing requests, public comments or requests for a public meeting should be submitted to the Office of the Chief Clerk, MC 105, TCEQ, P.O. Box 13087, Austin, TX 78711-3087. For information concerning the hearing process, please contact the Public Interest Counsel, MC 103, at the same address. For additional information, individual members of the general public may contact the Office of Public Assistance at 1-800-687-4040. General information regarding the TCEQ can be found at our web site at www.tceq.state.tx.us.

Issued: April 22, 2005

DRAFT 2-11-10

WATER USE PERMIT

PERMIT NO. 5851

TYPE §§ 11.121, 11.042 & 11.085

Permittee:	Brazos River Authority	Address:	P.O. Box 7555 Waco, Texas 76714-7555
Filed:	October 15, 2004	Granted:	
Purposes:	Domestic, Municipal, Agricultural, Industrial, and Mining	Counties:	Parmer, Castro, Swisher, Bailey, Lamb, Hale, Floyd, Cochran, Hockley, Archer, Lubbock, Crosby, Baylor, Dickens, King, Knox, Jack, Terry, Lynn, Mitchell, Chambers, Young, Garza, Throckmorton, Kent, Haskell, Stonewall, Parker, Palo Pinto, Dawson, Scurry, Borden, Fisher, Stephens, Jones, Shackelford, Johnson, Hood, Nolan, Erath, Eastland, Taylor, Callahan, Somervell, Hill, Comanche, Bosque, Brown, Freestone, Hamilton, McLennan, Limestone, Mills, Coryell, Leon, Falls, Lampasas, Robertson, Bell, Madison, Milam, Burnet, Brazos, Grimes, Williamson, Burleson, Travis, Lee, Washington, Bastrop, Fayette, Waller, Harris, Austin, Colorado, Fort Bend, Galveston, Matagorda, Wharton, and Brazoria
Watercourses:	Multiple Tributaries of the Brazos River and the Brazos River	Watersheds:	Brazos River Basin, Trinity River Basin, Red River Basin, Colorado River Basin, San Jacinto River Basin, San Jacinto-Brazos Coastal Basin, Brazos-Colorado Coastal Basin

DRAFT

WHEREAS, the Brazos River Authority, Applicant, owns the water rights and reservoirs authorized by Certificate of Adjudication (Certificate) No. 12-5155 (Possum Kingdom Lake), Certificate No. 12-5156 (Lake Granbury), Certificate No. 12-5165 (Lake Limestone), and Water Use Permit No. 2925A (Allens Creek Reservoir in conjunction with the Texas Water Development Board and the City of Houston); and

WHEREAS, Applicant also owns the water rights and has contracts with the United States Army Corps of Engineers for storage authorized by Certificate No. 12-5157 (Lake Whitney), Certificate No. 12-5158 (Lake Aquilla), Certificate No. 12-5159 (Lake Proctor), Certificate No. 12-5160 (Lake Belton), Certificate No. 12-5161 (Lake Stillhouse Hollow), Certificate No. 12-5162 (Lake Georgetown), Certificate No. 12-5163 (Lake Granger), Certificate No. 12-5164 (Lake Somerville); and

WHEREAS, Applicant also owns the water rights authorized by Certificates Nos. 12-5166 and 12-5167, which authorize various uses of water within the Applicant's other certificates and permits; and

WHEREAS, Applicant is currently authorized, pursuant to the 1964 System Operation Order, as amended, to manage and operate its tributary reservoirs as elements of a system, coordinating releases and diversions from the tributary reservoirs with releases and diversions from the Applicant's mainstem reservoirs to minimize waste, and to conserve water in reservoirs in which the supply is short by making releases from tributary reservoirs in which the supply is more abundant; and

WHEREAS, Applicant has indicated that their service area includes the following counties: Parmer, Castro, Swisher, Bailey, Lamb, Hale, Floyd, Cochran, Hockley, Archer, Lubbock, Crosby, Baylor, Dickens, King, Knox, Jack, Terry, Lynn, Mitchell, Chambers, Young, Garza, Throckmorton, Kent, Haskell, Stonewall, Parker, Palo Pinto, Dawson, Scurry, Borden, Fisher, Stephens, Jones, Shackelford, Johnson, Hood, Nolan, Erath, Eastland, Taylor, Callahan, Somervell, Hill, Comanche, Bosque, Brown, Freestone, Hamilton, McLennan, Limestone, Mills, Coryell, Leon, Falls, Lampasas, Robertson, Bell, Madison, Milam, Burnet, Brazos, Grimes, Williamson, Burleson, Travis, Lee, Washington, Bastrop, Fayette, Waller, Harris, Austin, Colorado, Fort Bend, Galveston, Matagorda, Wharton, Brazoria; and

WHEREAS, Applicant has applied for a Water Use Permit to authorize:

- A new appropriation of state water in the amount of 421,449 acre-feet per year for multiple uses, including domestic, municipal, agricultural, industrial, mining, and other beneficial uses on a firm basis in the Brazos River Basin. The amount of this new appropriation of water includes the current and future return flows requested in this application. Applicant indicates that the entire amount of 421,449 acre-feet of water per year is available only if all of it is diverted at the mouth of the Brazos River, and can only be made available by the Applicant through the system operation of its water rights. To the extent water is diverted upstream, the remaining unappropriated water downstream is reduced and will itself vary depending upon the location of its diversion and use. Out of the 421,449 acre-feet per year of unappropriated water being requested, the maximum amount of unappropriated water that will be available if such water is diverted upstream at USGS Gage No. 08091000 near Glen Rose, Texas is 150,538 acre-feet per year firm, and if such unappropriated water is diverted upstream at USGS Gage No. 08098290 near Highbank, Texas, the maximum amount of unappropriated water that will be available at that location is 144,306 acre-feet per year firm;

- Diversion of the water authorized by this permit, if granted, from: (i) the existing diversion points authorized by Applicant's existing water rights; (ii) the Brazos River at

the USGS Gage No. 08091000 near Glen Rose, Texas; (iii) the Brazos River at USGS Gage No. 08098290 near Highbank, Texas; (iv) the Brazos River at the Gulf of Mexico; and (v) at such other diversion points that may be identified and included in Applicant's proposed Water Management Plan which is subject to TCEQ's approval;

- Use of up to 90,000 acre-feet of water per year of its firm supply (part of the 421,449 acre-feet of firm water requested above) to produce, along with other unappropriated flows, an interruptible water supply of 670,000 acre-feet per year and the appropriation of that interruptible water supply. Applicant indicates that the entire amount of 1,001,449 acre-feet of water (331,449 acre-feet of firm water and 670,000 acre-feet of interruptible water) is available only if all of it is diverted at the mouth of the Brazos River, and can only be made available by the Applicant through the system operation of its water rights. To the extent water is diverted upstream, the remaining unappropriated water downstream is reduced and will itself vary depending on the location of its diversion and use. This new appropriation of water includes the current and future return flows requested in this application. Out of the 1,001,449 acre-feet of firm and interruptible water being requested, the maximum amount of firm and interruptible water that will be available if such water is diverted upstream at USGS Gage No. 08091000 near Glen Rose, Texas is 60,538 acre-feet of firm water per year and 157,000 acre-feet of interruptible water per year and if such water is diverted upstream at USGS Gage No. 08098290 near Highbank, Texas, the maximum amount of firm water is 54,306 acre-feet of water per year and 303,000 acre-feet of interruptible water per year;

- An exempt interbasin transfer authorization to transfer and use, on a firm and interruptible basis, such water in the adjoining San Jacinto-Brazos Coastal Basin and the Brazos-Colorado Coastal Basin, and to transfer such water to any county or municipality or the municipality's retail service area that is partially within the Brazos River Basin for use, on a firm and interruptible basis, in that part of the county or municipality and the municipality's retail service area not within the Brazos River Basin;

- An appropriation of current and future return flows (treated sewage effluent and brine bypass/return) to the extent that such return flows continue to be discharged or returned into the bed and banks of the Brazos River, its tributaries, and Applicant's reservoirs. Applicant indicates that such appropriation of return flows would be subject to interruption by direct reuse or indirect reuse within the discharging entity's city limits, extraterritorial jurisdiction, or contiguous water certificate of convenience and necessity boundary. Specified discharge points and amounts of water will be accounted for on a monthly basis as part of Applicant's Water Management Plan which is subject to TCEQ's approval;

- Operational flexibility to (1) use any source of water available to the Applicant to satisfy the diversion requirements of senior water rights to the same extent that those water rights would have been satisfied by passing inflows through the Applicant's reservoirs on a priority basis; and (2) release, pump and transport water from any of the Applicant's reservoirs for subsequent storage, diversion and use throughout the Applicant's service area. (Applicant's "service area" includes all counties listed above);

- Recognition that this System Operation Permit approved pursuant to this application will prevail over inconsistent provisions in the Applicant's existing water rights regarding system operation;

- Use of the bed and banks of the Brazos River, its tributaries and the Applicant's reservoirs for the conveyance, storage, and subsequent diversion of (i) water that the Applicant seeks to appropriate under this application; (ii) waters that are being conveyed via pipelines and subsequently discharged into the Brazos River, its tributaries or stored in the Applicant's reservoirs; (iii) surface water imported from areas located outside the Brazos River Basin for subsequent use; (iv) in-basin surface water and groundwater subject to the Applicant's control; (v) waters developed from future Applicant projects; and (vi) current and future reuse of surface and groundwater based return flows requested by this application. This bed and banks authorization is subject to Applicant, after identifying specific points of discharge and diversion and conveyance and other losses, obtaining future authorizations to satisfy the requirements of TWC § 11.042. Such points of discharge and diversion and conveyance and other losses may also be identified and included in Applicant's proposed Water Management Plan which is subject to TCEQ's approval; and

WHEREAS, until the construction of Allens Creek Reservoir is completed, Applicant requests that the System Operation Permit include special conditions which authorize:

- The Applicant to appropriate state water in the amount of 425,099 acre-feet per year for multiple use purposes, including domestic, municipal, agricultural, industrial, mining, and other beneficial uses on a firm basis in the Brazos River Basin. This amount includes the current and future return flows requested in this application. This amount is available if all of the water is diverted at the mouth of the Brazos River, and can only be made available by the Applicant through the system operation of its water rights. To the extent water is diverted upstream, the remaining unappropriated water downstream is reduced and will itself vary depending upon the location of its diversion and use. Out of the 425,099 acre-feet per year of unappropriated water being requested, the maximum amount of unappropriated water that will be available if such water is diverted upstream at USGS Gage No. 08091000 near Glen Rose, Texas is 150,538 acre-feet per year firm and if such unappropriated water is diverted upstream at USGS Gage No. 08098290 near Highbank, Texas the maximum amount of unappropriated water that will be available is, at that location, 175,306 acre-feet per year firm;

- The Applicant to use up to 90,000 acre-feet of water per year of its firm supply to produce, along with other unappropriated flows an interruptible water supply of 869,000 acre-feet per year. This amount includes the current and future return flows requested in this application. Applicant indicates that the entire amount of 1,204,099 acre-feet of water (335,099 acre-feet of firm water and 869,000 acre-feet of interruptible water) is only available if all of it is diverted at the mouth of the Brazos River, and can only be made available by the Applicant through the system operation of its water rights. To the extent water is diverted upstream, the remaining unappropriated water downstream is reduced and will itself vary depending upon the location of its diversion and use. Out of the 1,204,099 acre-feet of firm and interruptible water being requested, the maximum amount of firm and interruptible water that will be available if such water is diverted upstream at USGS Gage No. 08091000 near Glen Rose, Texas, will be 60,538 acre-feet of firm water per year and 190,000 acre-feet of interruptible water per year and if such water is diverted upstream at USGS Gage No. 08098290 near Highbank, Texas the maximum amount of firm water will be 85,306 acre-feet of water per year and 284,000 acre-feet of interruptible water per year;

- Exempt interbasin transfer authorization to transfer and use, on a firm and interruptible basis, such water in the adjoining San Jacinto-Brazos Coastal Basin and the Brazos-Colorado Coastal Basin, and to transfer such water to any county or municipality or the municipality's retail service area that is partially within the Brazos River Basin for use, on a firm and interruptible basis, in that part of the county or municipality and the municipality's retail service area not within the Brazos River Basin; and

WHEREAS, the Texas Commission on Environmental Quality (Commission) finds that jurisdiction over the application is established; and

WHEREAS, the Executive Director recommends that specific stream flow restrictions should be included in the permit to maintain the instream uses and water quality conditions of the Brazos River; and

WHEREAS, as additional factual and scientific information becomes available, it is anticipated that the interim special conditions in Paragraph 6.E. below relative to environmental flows will be revised, through Commission approved revisions of the Water Management Plan, to better provide for the environmental instream flow needs of the Brazos River and its tributaries and to make the maximum amount of water available for beneficial use that is consistent with those needs; and

WHEREAS, the Executive Director recommends that in order to protect senior and superior water rights owners, special conditions should be included in the permit; and

WHEREAS, to avoid ambiguities between this system operation authorization and Applicant's previous system operation authorizations reflected by the System Operation Order and existing permits, the Executive Director recommends that this System Operation Permit be subject to all provisions included in the Commission's July 23, 1964 System Operation Order, as amended, authorizing system operation of certain reservoirs in the Brazos River Basin and to all terms and conditions of Permittee's authorizations in Certificates Nos. 12-5155, 12-5156, 12-5165, 12-5157, 12-5160, 12-5159, 12-5164, 12-5161, 12-5163, 12-5162, 12-5158, 12-5166 and 12-5167 and Water Use Permit No. 2925A except to the extent specifically provided otherwise by this permit and as may be modified in the future by Commission approval of Applicant's Water Management Plan; and

WHEREAS, this application is subject to the Texas Coastal Management Program (CMP) and must be consistent with the CMP goals and policies; and

WHEREAS, the Commission finds that the issuance of this permit is consistent with the goals and policies of the Texas CMP; and

WHEREAS, the Commission has complied with the requirements of the Texas Water Code and Rules of the Texas Commission on Environmental Quality in issuing this permit;

NOW, THEREFORE, Water Use Permit No. 5851 is issued to the Brazos River Authority, subject to the following terms and conditions:

1. USE

A. NEW APPROPRIATION

1) Permittee is authorized to impound, divert, and use not to exceed the following volumes of unappropriated water per year for domestic, municipal, agricultural, industrial, and mining use within its service area subject to special conditions:

New Appropriation Amounts

Volume in acre-feet		
Location	**Firm Water**	**Non-firm Water**
Glen Rose	131,363	157,000
Highbank	144,306	303,000
Richmond	188,005	670,000
Gulf of Mexico	191,044	670,000

2) Until such time as the ports are closed on the dam impounding Allens Creek Reservoir, authorized by Water Use Permit No. 2925, in lieu of Paragraph 1.A.1, Permittee may impound, divert, and use not to exceed the following volumes of unappropriated water per year, subject to special conditions:

New Appropriation Amounts without Allens Creek

Volume in acre-feet without Allens Creek Reservoir		
Location	**Firm Water**	**Non-firm Water**
Glen Rose	131,363	190,000
Highbank	175,306	284,000
Richmond	237,920	869,000
Gulf of Mexico	241,765	869,000

B. USE OF BED AND BANKS

Permittee is authorized to use the bed and banks of the Brazos River below Possum Kingdom Lake, its tributaries and Permittee's authorized reservoirs for the conveyance, storage, and subsequent diversion of the water authorized herein, subject to identification of specific losses and special conditions.

C. INTERBASIN TRANSFER

Permittee is hereby granted an exempt interbasin transfer authorization to transfer and use the water authorized herein in Permittee's service area in the adjoining San Jacinto-Brazos Coastal Basin and the Brazos-Colorado Coastal Basin and to transfer such water to any county or municipality or the municipality's retail service area that is partially within the Brazos River Basin for use on a firm and non-firm basis in that part of the county or municipality and the municipality's retail service area within the Trinity, Red, Colorado, and San Jacinto River Basins.

D. RETURN FLOWS

Permittee is authorized to divert and use return flows discharged from the Permittee's facilities or originating from diversions pursuant to Permittee's water rights, as indicated in the table below, for multiple uses (domestic, municipal, agricultural, industrial, mining) within their service area, subject to special conditions to protect water rights granted based on the presence of those return flows as well as other senior water rights:

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Return Flows Available to Permittee

Name	TPDES Permit #	Permitted Discharge (mgd)	Current BRA Source	Percent of Surface Water from BRA	Current Surface Water Returns (ac-ft/yr)	Current Ground-water Returns (ac-ft/yr)
Sportsmans World MUD WTP	02461000	0.800	Possum Kingdom	100%	11.2	0
Double Diamond	02789000	0.060	Possum Kingdom	100%	67	0
Authority SWATS	02889000	2.500	Granbury System	100%	730	0
City of Copperas Cove	10045003	2.500	Lake Belton	100%	923	0
City of Copperas Cove	10045004	2.500	Lake Belton	100%	1,375	0
City of Copperas Cove	10045005	4.000	Lake Belton	100%	1,600	0
City of DeLeon	10078001	0.295	Lake Proctor	100%	192	0
City of Marlin	10110002	2.000	Whitney System	16%	159.4	0
City of Harker Heights	10155001	3.000	Lake Belton	100%	2,780	0
City of Gatesville	10176002	2.200	Lake Belton	100%	1,731	0
City of Gatesville	10176004	1.500	Lake Belton	100%	703	0
City of Granbury	10178002	2.000	Granbury System	23%	302	1,011
City of Lampasas	10205002	1.500	Lake Stillhouse Hollow	100%	580	0
City of McGregor (South WWTP)	10219002	1.100	Lake Belton	95%	651.7	0
City of Moody	10225001	0.200	Lake Belton	100%	157	0
BRA/LCRA BCRWSS West	10264001	3.000	Georgetown/Still -house System	100%	2,402	1,657

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Name	TPDES Permit #	Permitted Discharge (mgd)	Current BRA Source	Percent of Surface Water from BRA	Current Surface Water Returns (ac-ft/yr)	Current Ground-water Returns (ac-ft/yr)
BRA/LCRA BCRWSS East	10264002	21.500	Georgetown/Still-house System	100%	16,767	0
City of Taylor	10299001	4.000	Granger System	100%	2,220	0
Bell County WCID#1	10351001	0.900	Lake Belton	100%	983	0
Bell County WCID#1	10351002	18.000	Lake Belton	100%	14,123	0
Bell County WCID#1	10351003	6.000	Lake Belton	100%	5,389	0
City of Brenham	10388001	3.550	Lake Somerville	100%	2,485	0
City of Dublin	10405001	0.450	Lake Proctor	100%	325	0
City of Georgetown	10489002	2.500	Georgetown/Still-house System	100%	1,815	0
City of Georgetown	10489003	2.500	Georgetown/Still-house System	100%	1,423	0
City of Georgetown	10489005	3.000	Georgetown/Still-house System	100%	1,389	0
City of Hamilton	10492002	0.880	Lake Proctor	100%	392	0
City of Hillsboro	10630001	1.810	Lake Aquilla	100%	1,440	0
City of Rosebud	10731001	0.250	Lake Stillhouse Hollow	100%	194	0
Bell County WCID#3	10797001	0.675	Lake Belton	100%	360	0
City of Holland	10897001	0.200	Lake Stillhouse Hollow	100%	93	0
Bell County WCID#2	11090001	0.094	Lake Belton	100%	63	0
Bell County WCID#2	11091001	0.160	Lake Belton	100%	70	0
Authority TBRSS	11318001	10.000	Lake Belton	100%	8,523	0
Acton MUD	14211001	0.600	Granbury System	11%	40	326
Acton MUD	14212001	0.820	Granbury System	11%	29	239
City of Comanche	14445001	0.595	Lake Proctor	100%	324	0

2. DISCHARGE

The points of origin and rates for Permittee's return flows are itemized below:

Name	TPDES Permit #	Discharge (mgd)	Receiving Stream	North Latitude	West Longitude
Sportsmans World MUD WTP	02461000	0.800	Bluff Creek	32.845111	-98.486972
Double Diamond	02789000	0.060	Unnamed Tributary to the Brazos River	32.8552778	98.4186111
BRA[1] SWATS[2]	02889000	2.500	Lake Granbury/ Brazos River	32.4169445	97.6747223
City of Copperas Cove	10045003	2.500	Clear Creek	31.0925000	97.9072222
City of Copperas Cove	10045004	2.500	Unnamed tributary to Turkey Run	31.1297223	97.8808334
City of Copperas Cove	10045005	4.000	House Creek	31.1488889	97.9077778
City of DeLeon	10078001	0.295	Unnamed tributary to Leon River (Proctor Lake)	32.1111111	98.5238889
City of Marlin	10110002	2.000	Brazos River	31.2591667	96.9277778
City of Harker Heights	10155001	3.000	South Nolan Creek	31.0922222	97.6538889
City of Gatesville	10176002	2.200	Stillhouse Branch	31.4391666	97.7497222
City of Gatesville	10176004	1.500	Leon River	31.4261111	97.7441666
City of Granbury	10178002	2.000	Lake Granbury/Brazos River	32.4183334	97.7758334
City of Lampasas	10205002	1.500	Sulphur Creek	31.1893000	98.1540000
City of McGregor (South WWTP)	10219002	1.100	Unnamed tributary of South Bosque River	31.412416	97.395694
City of Moody	10225001	0.200	Unnamed tributary to Stampede Creek	31.3097222	97.3633333

Name	TPDES Permit #	Discharge (mgd)	Receiving Stream	North Latitude	West Longitude
BRA/LCRA[3] BCRWSS[4] West	10264001	3.000	Brushy Creek	30.5155556	97.6647222
BRA/LCRA[3] BCRWSS[4] East	10264002	21.500	Brushy Creek	30.5263889	97.6172223
City of Taylor	10299001	4.000	Mustang Creek	30.5575000	97.3883333
Bell County WCID[5]#1	10351001	0.900	Belton Lake	31.1252778	97.5152778
Bell County WCID[5]#1	10351002	18.000	South Nolan Creek	31.1075000	97.7016667
Bell County WCID[5]#1	10351003	6.000	South Nolan Creek	31.1086111	97.7036111
City of Brenham	10388001	3.550	Hog Branch	30.1711111	96.3775000
City of Dublin	10405001	0.450	Resley Creek	32.0619444	98.3369444
City of Georgetown	10489002	2.500	San Gabriel River	30.6530556	97.6613889
City of Georgetown	10489003	2.500	unnamed tributary to Mankins Branch	30.6313889	97.6311111
City of Georgetown	10489005	3.000	Berry Creek	30.672944	97.609750
City of Hamilton	10492002	0.880	Pecan Creek	31.7094444	98.1138889
City of Hillsboro	10630001	1.810	Hackberry Creek	31.9983333	97.1444444
City of Rosebud	10731001	0.250	Salt Creek	31.0633333	96.9911111
Bell County WCID[5]#3	10797001	0.675	South Nolan Creek	31.6688889	97.6038889
City of Holland	10897001	0.200	Unnamed tributary to Darr Creek	30.8808334	97.3958333
Bell County WCID[5]#2	11090001	0.094	Boggy Creek	30.9783334	97.3436111
Bell County WCID[5]#2	11091001	0.160	Unnamed tributary to Boggy Creek	30.9847222	97.3663889
BRA TBRSS[6]	11318001	10.000	Nolan Creek	31.0438889	97.4397222
Acton MUD	14211001	0.600	McCarty Branch	32.4372222	97.6952777

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Name	TPDES Permit #	Discharge (mgd)	Receiving Stream	North Latitude	West Longitude
Acton MUD[7]	14212001	0.820	Brazos River	32.3591667	97.6869444
City of Comanche	14445001	0.595	Indian Creek	31.8902777	98.5933333

1 BRA - Brazos River Authority
2 SWATS – Surface Water and Treatment System (Lake Granbury)
3 LCRA – Lower Colorado River Authority
4 BCRWSS – Brushy Creek Regional Wastewater Sewage System
5 WCID – Water Control & Improvement District
6 TBRSS – Temple-Belton Regional Sewage System
7 MUD – Municipal Utility District

3. DIVERSION

Permittee is authorized to divert and use the water authorized by this permit as follows:

A. POINTS

1) At the diversion points authorized by Permittee's existing water rights.

2) At United States Geological Survey (USGS) Gage No. 08091000, Brazos River near Glen Rose at Latitude 31.2589°N, Longitude 97.7022°W in Somervell County.

3) At USGS Gage No. 08098290, Brazos River near Highbank at Latitude 31.1339°N, Longitude 96.8247°W in Falls County.

4) At the mouth of the Brazos River at the Gulf of Mexico at Latitude 28.8783°N, Longitude 95.379111°W in Brazoria County.

5) At other such diversion points located in the reaches specified in USE Paragraph 1.B, above, or as may be identified and included in Permittee's Commission approved Water Management Plan, or as may be otherwise authorized in the future.

B. RATES

1) At the diversion rates authorized by the Certificates of Adjudication and Water Use Permit authorizing each of the reservoirs comprising the system operation as defined in this permit.

2) At unspecified rates at points within the reaches authorized in USE paragraph 1.B, including at the diversion points authorized by 3.A.2., 3.A.3., and 3.A.4., or points identified in the Commission approved Water Management Plan, subject to Permittee's accounting/delivery plan.

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4. PRIORITY

The priority date for the rights authorized by this permit is October 15, 2004.

5. CONSERVATION

Permittee shall implement water conservation plans that provide for the utilization of those reasonable practices, techniques, and technologies that will reduce on a per unit basis the consumption of water, prevent or reduce the loss or waste of water, improve the efficiency in the use of water, increase the recycling and reuse of water, and prevent the pollution of water, so that a water supply is made available for future or alternative uses. The practices, techniques, and technologies used shall be designed to achieve a level of efficiency of use that is equal to or greater than the level provided for in Permittee's most recent water conservation plans on file with the Commission as of the date of the issuance of this permit. Such plans shall include a requirement that in every wholesale water supply contract entered into on or after the date of this permit, including any contract extension or renewal, that each successive wholesale customer develop and implement conservation measures meeting the requirements of this provision. If the customer intends to resell the water, then the contract for resale of the water must have water conservation requirements so that each successive wholesale customer in the resale of the water is required to implement water conservation measures meeting the requirements of this provision.

6. SPECIAL CONDITIONS

A. SPECIAL CONDITIONS RELATIVE TO USE OF RETURN FLOWS

1) Prior to the diversion of return flows authorized by this permit, Permittee must submit to and have approved by the Executive Director, a return flow accounting plan. The return flow accounting plan must be in electronic format and account, by source, for all return flows discharged and subsequently diverted. The return flow accounting plan shall include amounts discharged by outfall, amounts of return flows used by permits granted based on the presence of these return flows, estimated travel times and conveyance losses from discharge point to diversion point(s), and environmental flow requirements. If the return flows will be stored in Permittee's reservoirs, the return flow accounting plan should include any evaporative losses associated with the storage of these return flows. Permittee shall maintain the approved return flow accounting plan in electronic format and make it available to the general public during normal business hours and to the Executive Director upon request. Modifications or changes to the return flow accounting plan must be approved by the Executive Director. The return flow accounting plan shall be included as part of Permittee's accounting/delivery plan.

2) The right to divert discharged return flows from plants owned by the City of Granbury (TPDES Permit No. 10178002), Acton MUD (TPDES Permits Nos. 14211001 and 14212001), Bell County WCID #2 (TPDES Permit No. 11090001), City of Georgetown (TPDES Permits Nos. 10489002 and 10489003) and the City of Holland (TPDES Permit No. 10897001) is limited to the amount of surface water based return flows discharged from those plants that originates from water rights owned by the Permittee. Permittee is not authorized to divert groundwater based return flows discharged from these plants, except as may be authorized by Special Condition 6.A.4. Permittee must include in the reuse

accounting plan the total amount discharged from the plants and the percentage of that water that is divertable under this permit.

3) Permittee is authorized to divert historically discharged groundwater based return flows from the Brazos River Authority/LCRA BCRWSS West (TPDES Permit No. 10264001).

4) Future discharges of groundwater based return flows may be diverted if those return flows originate from groundwater owned by Permittee or are discharged from treatment plants owned by the Permittee. Prior to diversion, Permittee must apply for and be granted an amendment to this permit authorizing these diversions and shall submit for approval by the Executive Director, a revised accounting/delivery plan addressing such new groundwater based discharges.

5) Permittee is authorized to divert only that water discharged by the City of Marlin (TPDES Permit No. 10110002) originating from water rights owned by the Permittee. Permittee shall calculate the divertable amount of the City's discharge and include this information in the reuse accounting plan.

6) Permittee shall only divert the actual annual amount of return flows discharged from the Bell County WCID #1 (TPDES Permits Nos. 10351001 and 10351002) and the City of Harker Heights (TPDES Permit No. 10155001) less up to 172 acre-feet as authorized by Water Use Permit No. 4218, 37 acre-feet as authorized by Permit 5088 and 60 acre-feet as authorized by Water Use Permit No. 5089 when the aforementioned permits are being used.

7) Diversions and storage of return flows shall not occur at rates or in amounts higher than the actual daily amount of return flows discharged into watercourses in the Brazos River Basin, after accounting for the calculated losses and travel time from the discharge point(s) to the diversion point(s) in accordance with the accounting/delivery plan.

8) Prior to diversion of the water authorized herein, if sufficiently accurate measuring devices are not available, Permittee shall install and maintain measuring device(s) capable of measuring within plus or minus 5% accuracy, at the discharge point of each wastewater treatment plant (WWTP) to record the amount of return flows discharged into the Brazos River or its tributaries on a daily basis.

9) The priority date for diversion of up to 120,625 acre-feet (107.639 mgd) of return flows is October 15, 2004, and these return flows are subject to the environmental flow requirements in Special Condition 6.E..

10) The priority date for diversion of future return flows in excess of 120,625 acre-feet (107.639 mgd) of discharged return flows is October 15, 2004 but is not subject to call by senior and superior permit holders in the basin and is not subject to instream flow limitations.

11) Prior to diversion of any return flows in excess of the individual TPDES Permit limits indicated in Paragraph 1.D. RETURN FLOWS, Permittee must apply for and be granted the right to reuse those return flows. Permittee must amend the

reuse accounting plan to include future return flows prior to diverting said return flows.

12) The diversion of up to 120,625 acre-feet (107.639 mgd) of water is dependent upon potentially interruptible return flows or discharges and is conditioned on the availability of those discharges. The right to divert the discharged return flows is subject to revocation if discharges become permanently unavailable for diversion and may be subject to reduction if the return flows are not available in quantities and qualities sufficient to fully satisfy the permit. Should any discharges become permanently unavailable for diversion, Permittee shall immediately cease diversions of these return flows and reflect such reductions in the reuse accounting plan.

13) Permittee's diversion and use of return flows is subject to interruption by direct use or indirect use within the discharging entity's corporate limits, extraterritorial jurisdiction, or contiguous water certificate of convenience and necessity boundary, provided the discharging entity has applied for and been granted authorization to reuse the return flows.

B. SPECIAL CONDITIONS RELATIVE TO USE OF BED AND BANKS

1) The use of the bed and banks of Allens Creek from below Allens Creek Reservoir to the Brazos River is not authorized until Permittee applies for and is granted an amendment to Water Use Permit No. 2925 authorizing such use.

2) Permittee is authorized to use the following reaches, authorized in Permittee's certificates and amendments, for conveyance of water, previously appropriated to the Permittee and water authorized by this permit, downstream for diversion at Glen Rose, Highbank and the Gulf of Mexico and any of the Permittee's currently authorized diversion points within these reaches:

a. Brazos River from below Possum Kingdom Lake to the Gulf of Mexico;
b. Leon River from Lake Proctor to the confluence with the Little River;
c. Lampasas River from Lake Stillhouse Hollow to the confluence with the Little River;
d. Little River from the junction of Leon and Lampasas Rivers to the confluence with the Brazos River;
e. Yegua Creek from Lake Somerville to the confluence with the Brazos River;
f. Navasota River from Lake Limestone to the confluence with the Brazos River;
g. San Gabriel River from Lake Granger to the confluence with the Little River and downstream to its confluence with the Brazos River;
h. North Fork San Gabriel River from Lake Georgetown to the confluence with the San Gabriel River, to its confluence with the Little River and downstream to its confluence with the Brazos River;
i. Aquilla Creek from Lake Aquilla downstream to its confluence with the Brazos River.

3) Prior to use of the bed and banks identified in Special Condition 6.B.2 above, Permittee must submit to and have approved by the Executive Director, as part of

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its accounting/delivery plan, a procedure to estimate daily deliveries of water. This procedure should be in electronic format and detail by source, type and priority date, the amounts to be conveyed and delivered, losses associated with the conveyance, specific points of diversion, associated travel times, and times of commencement and termination of transit for conveyed waters. Documentation of actual deliveries as well as the accounting/delivery plan shall be maintained by the Permittee in electronic format and made available to the general public during normal business hours and to the Executive Director upon request. Modifications or changes to the accounting/delivery plan must be approved by the Executive Director.

4) The use of the bed and banks of additional streams and tributaries in the Brazos River Basin for conveyance of water appropriated under this permit, or other sources available to the Permittee, is subject to Permittee, after identifying specific sources and types of water, specific points of discharge and diversion, and conveyance and other losses, obtaining future authorizations to satisfy the requirements of TWC § 11.042.

5) The use of additional points of diversion within the reaches specified in Special Condition 6.B.2 above is subject to Permittee obtaining authorization to use those diversion points. The points of diversion may also be identified and included in Permittee's proposed Water Management Plan which is subject to Commission approval.

C. SPECIAL CONDITIONS RELATIVE TO NEW APPROPRIATION

1) Prior to diversion or storage of the water authorized by this permit, Permittee shall provide to and have approved by the Executive Director, a daily accounting/delivery plan that includes, at a minimum, the following:

a. The accounting/delivery plan shall address reservoir storage and withdrawal plans for each system reservoir and account by priority date and amounts for any inflows, evaporation, water in storage and diversions from the reservoirs under all of Permittee's priority dates and authorizations including reuse;

b. A method to account for inflows to system reservoirs for purposes of compliance with special conditions requiring passage of pulse flows and estimation of those inflows;

c. An accounting of instream flow and pulse requirements to include total system storage, gage flows at the measurement points, high flow pulse volume impounded and the release schedule for the impounded high flow pulse, and timing, magnitude and duration of pulse flows;

d. The accounting/delivery plan must detail how measurements will be taken to determine if impoundment or diversions under either Permittee's senior or junior rights can be made;

e. The accounting/delivery plan must identify, account for, and distinguish between firm and non-firm water supplied or delivered from Permittee's system of reservoirs. In addition, the accounting/delivery plan must specify diversion points for this water if those diversion points are not specifically identified in this permit. Any additional diversion points must be within the reaches where use of the bed and banks is authorized.

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Any diversion points outside those reaches will require an amendment to this permit;

f. Permittee shall maintain the approved daily accounting/delivery plan in electronic format and make it available to the general public during normal business hours and to the Executive Director upon request. Modifications or changes to the plan must be approved by the Executive Director.

2) If the total amounts of firm water indicated in Paragraph 1.A.1 are diverted at Glen Rose or Highbank, the additional amount of firm water available below those points is reduced accordingly. The Water Management Plan shall include a mechanism for determining the amount of firm and non-firm water available at specific locations.

3) The full additional amount of non-firm water is only available when the amount of firm water is reduced by 90,000 acre-feet per year at Glen Rose, Highbank, Richmond and the Gulf of Mexico. If less than the full amount of non-firm water is used, the amount of the firm water reduction shall be adjusted pursuant to Special Condition 6.C.2.

4) The non-firm water authorized in Paragraph 1.A.1 includes 72,811 acre-feet of historically discharged return flows. A reduction in firm yield water is not required in order to divert these return flows.

5) The remaining 47,814 acre-feet of return flows out of the total amount of 120,625 acre-feet of return flows as specified in 1.D. may be diverted by the Permittee so long as the total diversions under this permit for all of the authorizations do not exceed the amounts of firm water and non-firm water indicated in Paragraph 1.A.1. unless Permittee applies for and is granted the authorization to divert additional amounts of water.

6) Permittee may not exercise a priority call on water rights in the Brazos River Basin with priority dates senior to October 15, 2004 for purposes of increasing storage in and/or diversion from Permittee's system reservoirs where drawdown of Permittee's system reservoirs is caused by compliance with the terms and conditions of this permit.

7) The request for operational flexibility to use any source of water available to Permittee to satisfy the diversion requirements of senior water rights to the same extent that those water rights would have been satisfied by passing inflows through the Permittee's system reservoirs on a priority basis is granted, but limited as follows:

a) To water previously stored in Permittee's reservoirs as documented in the accounting/delivery plan required in Special Condition 6.C.1 above;

b) Use of this option shall not cause Permittee to be out of compliance with Special Condition 6.C.1. and Special Condition 6.C.6.

8) Permittee may divert water from storage in its permitted reservoirs and store that water in Permittee's other reservoirs for use within the Permittee's service area so long as all diversions and storage are included in and comply with the

provisions of the accounting/delivery plan required by Special Condition 6.C.1. above.

9) The total amount of water diverted and released from Permittee's system reservoirs in any year for each authorized purpose of use may not exceed the cumulative authorized total for each purpose until Permittee applies for and is granted amendments to the underlying authorizations.

10) Permittee is required to comply with the existing System Operation Order and certificates of adjudication requiring Permittee to exclude tributary reservoirs from operation of the system during any period of time in which Permittee's permitted storage space in that reservoir is less than 30% full (until all system reservoirs are below 30% capacity, at which time the reservoir can resume system operation), until such time as Permittee submits, and the Commission approves, a Water Management Plan for the Brazos River Basin which details how such limitations will be altered. Any alterations to the limitations must be in compliance with the accounting provisions required in Special Condition 6.C.1 above.

11) Until such time as the ports are closed on the dam impounding Allens Creek Reservoir, authorized by Water Use Permit No. 2925, Permittee may impound and divert additional unappropriated water as specified in Paragraph 1.A.2 subject to Special Conditions 6.C.1 through 10 above.

12) Prior to diversion of water authorized by this permit below USGS Gage 08114000, Brazos River at Richmond, Permittee shall submit to the Executive Director, for review and approval, a method to extend the requirements of 6.E.5 and 6.E.7 to or below this point.

D. WATER MANAGEMENT PLAN SPECIAL CONDITIONS

1) Permittee shall prepare and submit to the Commission, a Water Management Plan (WMP) which shall include, in addition to the specific requirements listed below in Special Condition 6.D.4., such studies and other information as may be required by the Commission to demonstrate Permittee's compliance with and its ability to comply with all of the Special Conditions included in this permit.

2) The initial proceedings to consider the adoption of the WMP, and any major amendment thereof, shall be pursuant to contested case procedures. Any proceeding to consider the adoption or major amendment of the WMP shall be preceded by notice and opportunity to request a hearing, in accordance with the Commission's regulations applicable to water rights permitting proceedings. The WMP shall provide an adaptive management strategy for instream flow requirements and water supply and thus may be amended from time to time upon the request of Permittee, in accordance with the schedule set out in Special Condition 6.D.3. below, or on the Commission's own motion. The initial accounting/delivery plan shall be submitted for approval as part of the initial WMP.

3) An initial application for approval of the WMP shall be submitted to the Executive Director not later than three years after the date that this permit becomes final and non-appealable. Permittee shall take the necessary steps to ensure that the application for the WMP is administratively and technically complete within one year after the initial submission of the application to the Executive Director. Deadlines established in this provision may be extended by the Executive Director. At minimum, every ten years after approval of the initial WMP, Permittee shall submit to the Executive Director an application for reconsideration or amendment of the approved WMP.

4) The issues addressed in the initial application for approval of the WMP shall include, but not be limited to, the following:

a. Accounting/delivery plans (including return flow accounting plans);

b. Consideration of adding, deleting, or modifying the measurement points and flow levels described in 6.E.5 and 6.E.7;

c. Consideration of establishing diversion rate trigger levels for high flow pulse (HFP) requirements, included in 6.E.7, below which the requirements of 6.E.7 would not apply;

d. Establishment of a Brazos River Basin environmental flow study program identifying environmental flow studies to be conducted on specified reaches and the estimated time for completion of the studies. The program shall include studies anticipated to be required for the FERC relicensing of the hydropower facility at Morris Sheppard Dam and such studies necessary to comply with Special Conditions 6.E.1 and 6.E.17. Permittee shall use the program studies to evaluate the need for instream flow protection for the mainstem Brazos River and tributaries impacted by the diversion and storage of water authorized by this permit;

e. Development of operating guidelines to manage the frequency and magnitude of reservoir level fluctuations to avoid or minimize impacts on fisheries. The operating guidelines may be subject to temporary suspension if necessary for water supply purposes;

f. Consideration of establishing maximum diversion rates for diversions of water authorized in this permit;

g. Development of operational and accounting criteria, in addition to that specified in 6.A.1, 6.B.3, and 6.C.1, to address uncertainty in forecasting and accounting for HFPs in a manner that balances the risks and benefits between water supply and environmental flow protection;

h. Consideration of revised storage triggers provided for in 6.E.3 and 6.E.4; and the process for recalculating those triggers;

i. Alteration of 6.C.10 relating to capacity limitations on tributary reservoirs. Should the existing 30% limitation be modified for any of

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Permittee's system reservoirs, Permittee shall apply to amend the water right authorizing that reservoir;

j. Establishment of a mechanism to determine the amount of firm and non-firm water available at specific locations;

k. Development and implementation of a specific adaptive management strategy for meeting instream flow requirements consistent with providing water supplies. The adaptive management strategy shall include a monitoring program for assessing impacts on instream uses and address short and long term impacts to economically and ecologically important stream fisheries, unique aquatic communities and species, and water quality.

5) Upon notification to Permittee, TPWD may petition the Commission to amend any WMP provisions related to environmental flow protection.

E. INTERIM SPECIAL CONDITIONS RELATIVE TO ENVIRONMENTAL FLOWS

1) The following interim conditions are preliminary and are based upon historic flow analyses, without direct relationships to the biological and environmental benefits intended to be protected; therefore, Permittee shall conduct Instream Flow Studies (Studies) on the Brazos River and on segments of major tributaries upstream of their confluence with the Brazos River consistent with and in cooperation with the Texas Instream Flow Program (TIFP). Upon completion of the Studies, Permittee shall use the results to develop environmental flow conditions to replace the interim conditions in this permit for the measurement points identified in 6.E.5. Depending upon the time of completion of the Studies, replacement of these interim conditions shall be approved in the initial WMP or through the amendment of an approved WMP. The Studies are not limited to the geographic scope of the studies currently defined for the TIFP.

2) Seasons are defined as Spring (March–May), Summer (June-August), Fall (September-November), and Winter (December-February). The number of seasons and the months representing each season are subject to revision in the WMP based on best available science and information at the time of such revision.

3) Total storage in Permittee's system reservoirs is a trigger for determining instream flow requirements and is subject to revision in future Water Management Plans. 7Q2 flows are to be implemented when total storage in Permittee's system reservoirs is below 60% of total capacity. "Dry" means times when the total storage in Permittee's system reservoirs is below 74%, but more than 60% of total capacity. "Average" means times when the total storage in Permittee's system reservoirs is at least 74%, but less than 96% of total capacity. "Wet" means times when the total storage in Permittee's system reservoirs is at least 96% of total capacity.

4) Permittee shall recalculate the storage triggers specified in 6.E.3 every five years to ensure that Subsistence, Dry, Average, and Wet conditions occur at the

desired frequencies. The desired frequencies are Subsistence equal to 2.5% of the time, Dry equal to 22.5% of the time, Average equal to 50% of the time and Wet equal to 25% of the time.

5) Until such time as the Studies are completed, the interim instream flows in the following tables apply at the following USGS gauging stations. Measurement points for instream flows are subject to change in the WMP with approval of the Executive Director. The instream flow criteria in the following tables are applicable at all times. Depending upon the hydrologic condition (Subsistence, Dry, Average, or Wet), storage of water authorized by this permit in Permittee's system reservoirs upstream from the following flow gauging stations and the diversion and use of water pursuant to this permit at locations upstream from the flow gauging locations shall be authorized when streamflows exceed the instantaneous flow values established in the following tables:

Instream Flow (cfs)	BRAZOS RIVER NEAR GLEN ROSE - USGS #08091000			
	Winter	Spring	Summer	Fall
Subsistence (7Q2)	15.3	15.3	15.3	15.3
Dry	39.0	45.0	33.3	62.0
Average	92.0	138.0	101.5	150.0
Wet	234.0	292.8	249.5	332.0

Instream Flow (cfs)	YEGUA CREEK NEAR SOMERVILLE – USGS #08110000			
	Winter	Spring	Summer	Fall
Subsistence (7Q2)	0.1	0.1	0.1	0.1
Dry	5.6	3.9	0.4	0.3
Average	14.0	12.0	2.5	1.8
Wet	34.0	31.0	8.9	9.6

Instream Flow (cfs)	NAVASOTA RIVER NEAR EASTERLY USGS #08110500			
	Winter	Spring	Summer	Fall
Subsistence (7Q2)	7.6	7.6	7.6	7.6
Dry	7.6	10.0	7.6	7.6
Average	15.0	24.0	7.6	7.6
Wet	36.0	43.0	7.6	7.6

Instream Flow (cfs)	LITTLE RIVER NEAR CAMERON – USGS #08106500			
	Winter	Spring	Summer	Fall
Subsistence (7Q2)	67.9	67.9	67.9	67.9
Dry	100.0	135.0	133.0	82.0
Average	200.0	365.0	260.5	152.0
Wet	475.0	730.0	500.0	342.0

Instream Flow (cfs)	BRAZOS RIVER NEAR HIGHBANK – USGS #08098290			
	Winter	Spring	Summer	Fall
Subsistence (7Q2)	167.1	167.1	167.1	167.1
Dry	167.1	167.1	167.1	167.1
Average	220.59	344.19	323.85	225.29
Wet	672.74	759.30	780.69	508.98

Instream Flow (cfs)	BRAZOS RIVER NEAR RICHMOND – USGS #08114000			
	Winter	Spring	Summer	Fall
Subsistence (7Q2)	743	743	743	743
Dry	885	1,170	930	760
Average	1,630	2,030	1,450	1,150
Wet	2,955	3,670	2,635	2,038

6) A High Flow Pulse (HFP) is initiated when flows are greater than the 10th percentile and increase by more than 50% from the previous day, or when flows exceed the 75th percentile, regardless of the rate of change. A HFP is terminated when the flow drops below the 10th percentile or when the flow decreases from one day to the next by less than 5%, or when a succeeding pulse occurs. An entire HFP is also classified as a small flood if the maximum rate exceeds the small flood threshold at the 1.5 year recurrence interval.

7) Permittee shall meet a seasonal schedule of individual high flow pulses. Qualifying HFPs are defined as follows:

Pulse Flows (ac-ft)	BRAZOS RIVER NEAR GLEN ROSE - USGS #08091000			
Hydrologic Condition	Winter	Spring	Summer	Fall
Dry	2,329.6	3,208.3	2,617.2	2,211.6
Average	7,325.0	14,915.7	7,265.5	7,565.0
Wet	31,220.8	36,144.8	33,064.5	28,682.0

Peak Flows (cfs)	BRAZOS RIVER NEAR GLEN ROSE - USGS #08091000			
Hydrologic Condition	Winter	Spring	Summer	Fall
Dry	403	466	394	347
Average	1,120	2,070	1,320	1,040
Wet	4,945	5,265	4,370	3,525

Pulse Flow Schedule (days/# of events)	BRAZOS RIVER NEAR GLEN ROSE - USGS #08091000							
	Winter		Spring		Summer		Fall	
Hydrologic Condition	Dura*	Freq**	Dura	Freq	Dura	Freq	Dura	Freq
Dry	6	2	4	3	4	2	4	2
Average	7	2	6	2	6	2	7	1
Wet	13	1	10	2	11	1	11	1

*Duration **Frequency

Pulse Flows (ac-ft)	YEGUA CREEK NEAR SOMERVILLE – USGS #08110000			
Hydrologic Condition	Winter	Spring	Summer	Fall
Dry	416.6	275.7	52.4	59.2
Average	1,904.1	1,225.8	239.2	372.9
Wet	8,510.1	4,331.3	845.2	3,367.3

Peak Flows (cfs)	YEGUA CREEK NEAR SOMERVILLE – USGS #08110000			
Hydrologic Condition	Winter	Spring	Summer	Fall
Dry	69	51	13	10
Average	294	176	53	64
Wet	978	620	140	490

Pulse Flow Schedule (days/# of events)	YEGUA CREEK NEAR SOMERVILLE – USGS #08110000							
	Winter		Spring		Summer		Fall	
Hydrologic Condition	Dura*	Freq**	Dura	Freq	Dura	Freq	Dura	Freq
Dry	5	2	5	2	4	2	5	1
Average	10	1	8	1	7	1	7	2
Wet	15	1	13	1	11	1	11	1

*Duration **Frequency

Pulse Flows (ac-ft)	NAVASOTA RIVER NEAR EASTERLY-USGS #08110500			
Hydrologic Condition	Winter	Spring	Summer	Fall
Dry	439.3	748.3	195.9	77.1
Average	2,142.1	2,220.5	746.9	275.0
Wet	7,927.9	8,537.9	3,399.7	2,456.3

Peak Flows (cfs)	NAVASOTA RIVER NEAR EASTERLY – USGS #08110500			
Hydrologic Condition	Winter	Spring	Summer	Fall
Dry	76	124	33	11
Average	298	344	142	43
Wet	1,060	1,160	592	371

Pulse Flow Schedule (days/# of events)	NAVASOTA RIVER NEAR EASTERLY – USGS #08110500							
	Winter		Spring		Summer		Fall	
Hydrologic Condition	Dura*	Freq**	Dura	Freq	Dura	Freq	Dura	Freq
Dry	5	2	5	3	5	2	4	2
Average	8	2	9	2	8	2	7	2
Wet	12	1	12	1	13	1	11	1

*Duration **Frequency

Pulse Flows (ac-ft)	LITTLE RIVER NEAR CAMERON – USGS #08106500			
Hydrologic Condition	Winter	Spring	Summer	Fall
Dry	4,194.4	5,641.5	3,563.3	3,511.2
Average	9,633.7	16,251.6	9,088.3	9,183.5
Wet	29,414.9	42,034.7	25,811.4	20,494.2

Peak Flows (cfs)	LITTLE RIVER NEAR CAMERON – USGS #08106500			
Hydrologic Condition	Winter	Spring	Summer	Fall
Dry	604	958	577	568
Average	1,600	2,545	1,875	1,630
Wet	5,190	6,405	3,665	3,723

Pulse Flow Schedule (days/# of events)	LITTLE RIVER NEAR CAMERON – USGS #08106500							
	Winter		Spring		Summer		Fall	
Hydrologic Condition	Dura*	Freq**	Dura	Freq	Dura	Freq	Dura	Freq
Dry	5	1	4	2	4	2	4	2
Average	6	1	6	2	6	1	6	1
Wet	10	1	9	1	9	1	9	1

*Duration **Frequency

Pulse Flows (ac-ft)	BRAZOS RIVER AT HIGHBANK – USGS #08098290			
Hydrologic Condition	Winter	Spring	Summer	Fall
Dry	5,113.9	6,040.7	4,784.0	3,652.4
Average	11,647.1	14,346.9	15,135.1	11,398.8
Wet	38,514.1	38,127.3	49,810.6	39,416.6

Peak Flows (cfs)	BRAZOS RIVER AT HIGHBANK – USGS #08098290			
Hydrologic Condition	Winter	Spring	Summer	Fall
Dry	1,471	1,429	1,116	714
Average	2,576	2,952	2,566	2,274
Wet	5,225	6,748	7,703	5,366

Pulse Flow Schedule (days/# of events)	BRAZOS RIVER AT HIGHBANK – USGS #08098290							
	Winter		Spring		Summer		Fall	
Hydrologic Condition	Dura*	Freq**	Dura	Freq	Dura	Freq	Dura	Freq
Dry	3	1	3	3	3	3	3	2
Average	4	1	4	3	5	2	5	2
Wet	7	1	7	1	8	1	9	1

*Duration **Frequency

Pulse Flows (ac-ft)	BRAZOS RIVER NEAR RICHMOND – USGS #08114000			
Hydrologic Condition	Winter	Spring	Summer	Fall
Dry	36,265.8	44,667.8	38,181.1	22,457.9
Average	90,287.6	101,405.0	77,176.9	56,162.0
Wet	297,550.4	270,153.7	166,115.7	146,866.1

Peak Flows (cfs)	BRAZOS RIVER NEAR RICHMOND – USGS #08114000			
Hydrologic Condition	Winter	Spring	Summer	Fall
Dry	3,748	5,640	4,880	2,500
Average	9,670	10,200	8,830	7,730
Wet	19,500	19,150	15,300	13,175

Pulse Flow Schedule (days/# of events)	BRAZOS RIVER NEAR RICHMOND – USGS #08114000							
	Winter		Spring		Summer		Fall	
Hydrologic Condition	Dura*	Freq**	Dura	Freq	Dura	Freq	Dura	Freq
Dry	5	1	5	1	4	1	4	1
Average	8	1	7	1	7	1	7	1
Wet	16	1	13	1	12	1	11	1

*Duration **Frequency

8) Except under Subsistence conditions, diversion or storage of water upstream from defined measurement points under the authority of this permit shall be authorized during a pulse when the volume, duration, and peak flow of the individual pulse exceeds the individual pulse criteria, or when the number of pulse events in that season exceeds the pulse frequency criteria. When a Qualifying HFP is passed or provided for at one of the six defined measurement points it may be used as credit for meeting one seasonal HFP frequency requirement.

9) For streamflow events that meet the requirements of Special Condition 6.E.5, Permittee may temporarily impound all flows in excess of the instream flow requirement. If the streamflow event provided a Qualifying HFP, flow may need to be passed downstream for environmental needs, subject to seasonal requirements in Special Condition 6.E.7 above. If it did not, then Permittee may retain the impounded water for water supply purposes. Once the required number of HFPs is met, Permittee may divert or impound all subsequent HFPs for use as water supply as long as instream flow requirements specified in Special Condition 6.E.5 are met.

10) For pulses that generate a volume in excess of 250% of the Qualifying HFP volume criterion, Permittee shall provide two Qualifying HFPs with at least one week of instream flow, as required by Special Condition 6.E.5 above, between them. Similarly, for pulses in excess of 350% of the Qualifiying HFP volume criterion, Permittee shall provide three Qualifying HFPs with at least one week of instream flow between each pair. A similarly scaled requirement holds for larger pulses.

11) For streamflow events that meet the requirements of Special Condition 6.E.6, but do not meet the minimum requirements of a Qualifying HFP, Permittee may impound flows in excess of instream flow requirements and shall record the impounded volume in its accounting/delivery plan. At such time as the cumulative volume of streamflow events exceeds the volume of a Qualifying HFP, Permittee may release such a pulse to the environment. Such a release will result in a credit for a Qualifying HFP.

12) If the streamflow event is designated an HFP but ultimately does not meet the minimum requirements of a Qualifying HFP, the volume passed shall be

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recorded in the accounting/delivery plan. At such time as the cumulative volume of such pulses exceeds the volume of a Qualifying HFP, Permittee will be credited with one Qualifying HFP (even if the duration, peak flow, etc. characteristics were not met).

13) For purposes of determining satisfaction of Qualifying HFP criteria, each season is accounted for independently. There is no carry-over from season to season, either in regard to exceeding or not meeting HFP requirements. In the event there are seasons where the requisite number or volume of HFPs do not occur naturally, the Permittee is not obligated to meet the seasonal HFP requirements. In the event that a pulse extends across seasonal boundaries, it will be accounted in the season in which it ends.

14) Seasonal HFP requirements are to be met using streamflow events with peak flows less than the 1.5-year return interval; however, streamflow events with both peak flows that exceed the 1.5-year return interval and satisfy the requirements of a Qualifying HFP may be classified as both overbanking flows and an HFP.

15) Special Conditions 6.E.6 - 6.E.14, relating to High Flow Pulses are subject to Special Condition 6.D.4, relating to the contents of the initial application for approval of the WMP.

16) In addition to the measurement points and requirements specified in Special Conditions 6.E.5 and 6.E.7 above, Permittee is prohibited from diverting and storing water authorized by this permit upstream of the following gages unless streamflow at the following gages meets or exceeds the values as follows:

Gage Name	Gage #	7Q2 Value (cfs)
Brazos River near Palo Pinto	08089000	32.0
Aquilla Creek above Aquilla	08093360	0.1
Brazos River near Aquilla	08093100	26.0
Leon River near Belton	08102500	4.7
Leon River near Gatesville	08100500	4.7
Lampasas River near Belton	08104100	4.8
N Fork San Gabriel River near Georgetown	08104700	1.1
San Gabriel River at Laneport	08105700	3.6

17) Permittee, in cooperation with TPWD and the Commission, shall conduct Monitoring Studies to assess instream flow protection at the water quality protection measurement points identified in 6.E.16. These Monitoring Studies shall collect baseline data on the biology, habitat, water quality, hydrology, ecosystem health and other environmental factors of the stream segment between the water quality protection point and the immediate downstream measurement point. If baseline data is sufficient to determine instream flow protection needs, and such criteria are determined to be necessary, the data shall be used to develop criteria to replace the values in 6.E.16. If the results of the Monitoring Studies

indicate that additional study is needed, Instream Flow Studies shall be conducted to determine appropriate instream flow protection criteria for the water quality protection points and the results of such Instream Flow Studies shall be used to develop criteria to replace the values in 6.E.16. Depending upon the time of completion of the Monitoring Studies or applicable Instream Flow Studies, modification of the values in 6.E.16 shall be approved in the initial WMP or through the amendment of an approved WMP. As part of the study and analysis required in this provision, Permittee shall perform and complete a Little River watershed study (including all points identified in 6.E.16 within the Little River watershed) prior to filing its application for approval of the initial WMP. If Permittee does not complete the Little River watershed study prior to filing its application for approval of the initial WMP, Permittee shall not divert or impound water authorized by this permit from the Little River watershed until that study is completed and results considered in an application to amend the WMP.

18) Permittee shall consult with the U.S. Army Corps of Engineers on federal projects to determine whether overbanking flows can be safely managed to maintain a sound ecological environment.

19) The requirements of these Special Conditions apply only to diversion and storage under the authority of this permit and do not address or limit diversion and storage of water authorized by other water rights held by Permittee.

20) These special conditions are subject to adjustment by the Commission if the Commission determines, through an expedited public review process, that such adjustment is appropriate to achieve compliance with applicable environmental flow standards adopted pursuant to Texas Water Code § 11.1471. Any adjustment shall be made in accordance with the provisions of Texas Water Code § 11.147(e-1).

This permit is issued subject to all superior and senior water rights in the Brazos River Basin.

Permittee agrees to be bound by the terms, conditions and provisions contained herein and such agreement is a condition precedent to the granting of this permit.

All other matters requested in the application which are not specifically granted by this permit are denied.

This permit is issued subject to the Rules of the Texas Commission on Environmental Quality and to the right of continuing supervision of state water resources exercised by the Commission.

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For the Commission

ISSUED:

Texas Commission on Environmental Quality

INTEROFFICE MEMORANDUM

To: Ron Ellis, Application Manager
Water Rights Permitting Team

November 25, 2008

Through: Lann Bookout, Team Leader
Surface Water Availability & Interstate Compacts Team

From: Kathy Alexander, Hydrologist
Surface Water Availability & Interstate Compacts Team

Subject: Brazos River Authority
Application 5851
CN600506794
Brazos River, Brazos River Basin

WATER AVAILABILITY ANALYSIS

Application Summary

The Brazos River Authority (BRA or the Authority) has applied for a permit, designated its "System Operation Permit". The BRA owns the following water rights, which comprise BRA's system of reservoirs: Certificate No. 12-5155 (Possum Kingdom Lake), Certificate No. 12-5156 (Lake Granbury), Certificate No. 12-5165 (Lake Limestone), Certificate No. 12-5157 (Lake Whitney), Certificate No. 12-5160 (Lake Belton), Certificate No. 12-5159 (Lake Proctor), Certificate No. 12-5164 (Lake Somerville), Certificate No. 12-5161 (Lake Stillhouse Hollow), Certificate No. 12-5163 (Lake Granger), Certificate No. 12-5162 (Lake Georgetown) and Certificate No. 12-5158 (Lake Aquilla). The BRA, along with the Texas Water Development Board and the City of Houston, owns Water Use Permit 2925A (Allens Creek Reservoir). The BRA also owns Certificate Nos. 12-5166 and 12-5167, which authorize various uses of water within the applicant's other certificates and permits. The applicant is currently authorized, pursuant to a TCEQ order, to manage and operate its tributary reservoirs as elements of a system, coordinating releases and diversions from the tributary reservoirs with releases and diversions from the applicant's main-stem reservoirs to conserve water.

BRA seeks a Water Use Permit to authorize:

- A new appropriation of state water in the amount of 421,449 acre-feet per year for multiple use purposes on a firm basis in the Brazos River Basin. Out of the 421,449 acre-feet per year of unappropriated water being requested, the maximum amount of unappropriated water that will be available if such water is diverted upstream at USGS gage No. 08091000 near Glen Rose, Texas is 150,538 acre-feet per year of firm water, and if such unappropriated water is diverted upstream at USGS gage No. 08098290 near Highbank, Texas, the maximum amount of unappropriated water that will be available at that location is 144,306 acre-feet per year of firm water.

- Diversion of the water from: (i) the existing diversion points authorized by BRA's existing water rights; (ii) the Brazos River at the USGS gage No. 08091000 near Glen Rose, Texas; (iii) the Brazos River at USGS gage No. 08098290 near Highbank, Texas; (iv) the Brazos River at the

Gulf of Mexico; and (v) at such other diversion points that may be identified and included in BRA's proposed Water Management Plan (WMP), which is subject to TCEQ's approval.

- Use of up to 90,000 acre-feet of water per year of the firm supply to produce, along with other unappropriated flows, an interruptible water supply of 670,000 acre-feet per year and the appropriation of that interruptible water supply. Out of the 1,001,449 acre-feet of firm and interruptible water being requested, the maximum amount of firm and interruptible water that will be available if such water is diverted upstream at USGS Gage No. 08091000 near Glen Rose, Texas is 60,538 acre-feet of firm water per year and 157,000 acre-feet of interruptible water per year and if such water is diverted upstream at USGS Gage No. 08098290 near Highbank, Texas, the maximum amount of firm water is 54,306 acre-feet of water per year and 303,000 acre-feet of interruptible water per year.

- An exempt interbasin transfer authorization to use, on a firm and interruptible basis, the appropriated water in the adjoining San Jacinto-Brazos Coastal Basin and the Brazos-Colorado Coastal Basin.

- An appropriation of current and future return flows (treated sewage effluent and brine bypass/return) to the extent that such return flows continue to be discharged or returned into the bed and banks of the Brazos River, its tributaries, and BRA's reservoirs. BRA indicates that such appropriation of return flows would be subject to interruption by direct use or indirect use within the discharging entity's city limits, extraterritorial jurisdiction, or contiguous water certificate of convenience and necessity boundary. Specified discharge points and amounts of water will be accounted for on a monthly basis as part of BRA's WMP, which is subject to TCEQ's approval.

- Operational flexibility to (i) use any source of water available to BRA to satisfy the diversion requirements of senior water rights to the same extent that those water rights would have been satisfied by passing inflows through the BRA's reservoirs on a priority basis; and (ii) release, pump and transport water from any of the BRA's reservoirs for subsequent storage, diversion and use throughout the BRA's service area.

- Recognition that the System Operation Permit will prevail over inconsistent provisions in the BRA's existing water rights regarding system operation.

- Use of the bed and banks of the Brazos River, its tributaries and BRA's reservoirs for the conveyance, storage, and subsequent diversion of (i) water appropriated under this application; (ii) waters that are being conveyed via pipelines and subsequently discharged into the Brazos River, its tributaries or stored in the BRA's reservoirs; (iii) surface water imported from areas located outside the Brazos River Basin for subsequent use; (iv) in-basin surface water and groundwater subject to BRA's control;(v) waters developed from future projects; and (vi) current and future reuse of surface and groundwater based effluent requested by this application. This bed and banks authorization is subject to BRA, after identifying specific points of discharge and diversion and conveyance and other losses, obtaining future authorizations to satisfy the requirements of TWC § 11.042. Such points of discharge and diversion and conveyance and other losses may also be identified and included in BRA's proposed WMP, which is subject to TCEQ's approval.

Until the construction of Allens Creek Reservoir is completed, the BRA requests that the System Operation Permit include special conditions which authorize:

- Appropriation of state water in the amount of 425,099 acre-feet per year for multiple use purposes on a firm basis in the Brazos River Basin. Out of the 425,099 acre-feet per year of unappropriated water being requested, the maximum amount of unappropriated water that will be available if such water is diverted upstream at USGS Gage 08091000 near Glen Rose, Texas is 150,538 acre-feet per year of firm water and if such unappropriated water is diverted upstream at USGS Gage 08098290 near Highbank, Texas the maximum amount of unappropriated water that will be available is, at that location, 175,306 acre-feet per year firm water.

- Use of up to 90,000 acre-feet of water per year of BRA's firm supply to produce, along with other unappropriated flows, an interruptible water supply of 869,000 acre-feet per year. Out of the 1,204,099 acre-feet of firm and interruptible water being requested, the maximum amount of firm and interruptible water that will be available if such water is diverted upstream at USGS Gage No. 08091000 near Glen Rose, Texas, will be 60,538 acre-feet of firm water per year and 190,000 acre-feet of interruptible water per year and if such water is diverted upstream at USGS Gage No. 08098290 near Highbank, Texas the maximum amount of firm water will be 85,306 acre-feet of water per year and 284,000 acre-feet of interruptible water per year.

- Exempt interbasin transfer authorization to use, on a firm and interruptible basis, the appropriated water in the adjoining San Jacinto-Brazos Coastal Basin and the Brazos-Colorado Coastal Basin and to transfer such water to any county, municipality or the municipality's retail service area that is partially in the Brazos River Basin for use in that part of the county or municipality's retail service area not within the Brazos River Basin.

Water Availability Analysis

The Commission's Water Availability Model (WAM) for the Brazos River Basin protects existing water rights based on the prior appropriation doctrine. The period of record for the Brazos WAM is 1940 through 1997. The application was declared administratively complete on October 15, 2004. TCEQ Resource Protection Staff recommends that the application be subject to special conditions to protect aquatic habitat and the environment, including the following (For specific numeric values for the flow requirements below, refer to the Resource Protection Staff memo dated November 25, 2008):

1. Total storage in Permittee's system reservoirs is the trigger for determining hydrologic condition, which, in turn, determines instream flow requirements.
2. Interim instream flow requirements apply at six USGS gaging stations. The instream flow requirements are applicable at all times.
3. The level of flow (i.e., Subsistence, Dry, Average, or Wet) is determined seasonally based on hydrologic condition.
4. Permittee shall meet a seasonal schedule of individual high flow pulses. The magnitude, duration, timing and frequency and measurement location for the pulses are included as special conditions in Resource Protection Staff's memo (Additional discussion of how these high flow pulses were included in the availability analysis is included in Section C.2 (*Unappropriated Water*) of this memo).
5. In addition to the above requirements, Permittee is prohibited from diverting and

storing water authorized by this permit unless streamflow meets or exceeds the 7Q2 value at additional gages located below Permittee's reservoirs as specified in Resource Protection Staff's memo.

A. *Interbasin Transfer and Bed and Banks*

Pursuant to TWC §11.085(v)(3) and (v)(4), the request for an exempt interbasin transfer does not require a water availability analysis. For the request to use the bed and banks of the Brazos River and its tributaries, the application indicates that although specific locations, quantities and diversion rates for the bed and banks request are unknown at this time, potential diversion locations include the perimeter of all existing and proposed BRA reservoirs. The application also indicates that potential diversion locations include the following stream reaches:

- Brazos River from the confluence of the Salt and Double Mountain Forks to the Gulf of Mexico,
- Double Mountain Fork of the Brazos River below Lake Alan Henry to its confluence with the Brazos River,
- Leon River from Lake Proctor to the confluence with the Little River,
- Lampasas River from Lake Stillhouse Hollow to the confluence with the Little River,
- Little River from the junction of Leon and Lampasas Rivers to the confluence with the Brazos River,
- Yegua Creek from Lake Somerville to the confluence with the Brazos River,
- Navasota River from Lake Limestone to the confluence with the Brazos River,
- Allens Creek from below Allens Creek Reservoir to confluence with the Brazos River,
- Any other tributary of the Brazos River into which water appropriated under this application (groundwater or surface water under the control of BRA) is discharged.

With the exception of Permit 2925 (Allens Creek Reservoir), BRA's current rights authorize use of the bed and banks of the Brazos River and its tributaries below the Authority's reservoirs to deliver water to downstream customers. The application indicates that the location of specific amounts, rates, releases and loss information will be detailed in BRA's Management Plan once the specific amount of unappropriated water and return flows available to BRA is determined. Staff is of the opinion that accounting for the bed and banks transfer of water through a delivery plan will mitigate any effects on basin water rights. The accounting/delivery plan should be included in BRA's Water Management Plan (WMP).

B. Return Flows

The application requests appropriation of current and future return flows in the Brazos Basin discharged from 136 locations by various entities. These discharges include surface and groundwater based return flows. The surface water based return flow includes discharges from BRA facilities, discharges of water originating from BRA's water rights, as well as discharges from facilities owned by other entities and originating from non-BRA sources of supply.

A review of water rights in the Brazos River Basin indicates that Permit 4218 (diversion of 172 acre-feet of water from South Nolan Creek); Permit 5088 (diversion of 37 acre-feet of water from South Nolan Creek); and Permit 5089 (diversion of 60 acre-feet of water from South Nolan Creek) were explicitly granted based on the presence of return flows now being claimed as part of this application. Staff

recognizes the possibility that other basin rights were granted based on the presence of the requested return flows. Because of this, a priority date of October 15, 2004 is assigned to the applicant's diversions of historically discharged return flows. To evaluate the request for reuse of return flows, staff identified those return flows discharged from BRA facilities, or originating from diversions authorized by BRA's existing water rights, that have not been previously appropriated by other water rights as indicated in Table 1. below. BRA also requested reuse of return flows generated by four power plants that receive contract water from BRA's water rights. These return flows result from once through cooling water, or other power plant operations, and are thus highly variable. The application did not provide sufficient information to evaluate this request and these return flows were not included in the analysis.

The Current Conditions data set was updated with the amount of current return flows as indicated in the application (74,387 acre-feet which is the sum of the maximum reported annual discharge amounts for each plant). The request to reuse return flows was modeled at the most downstream point in the basin to determine the volume of return flows available to BRA on a basin-wide basis. Results indicate that 100% and 75% of the return flows were available in 45% and 81% of the years in the period of record, respectively and the monthly amount of discharged return flows was available in 87% of the months.

Table 1. Return Flows Available to BRA

Name	TPDES Permit Number	Permitted Discharge (mgd)	Current BRA Source	Percent of SW from BRA	Current Surface Water Returns (ac-ft/yr)	Current Ground-water Returns (ac-ft/yr)
Sportsmans World MUD WTP	02461000	0.01	Possum Kingdom	100%	11.2	0
Double Diamond	02789000	0.06	Possum Kingdom	100%	67	0
Authority SWATS	02889000	2.5	Granbury System	100%	730	0
City of Copperas Cove	10045003	2.5	Lake Belton	100%	923	0
City of Copperas Cove	10045004	2.5	Lake Belton	100%	1,375	0
City of Copperas Cove	10045005	4.0	Lake Belton	100%	1,600	0
City of DeLeon	10078001	0.3	Lake Proctor	100%	192	0
City of Marlin	10110002	2.0	Whitney System	16%	159.4	0
City of Harker Heights	10155001	3.0	Lake Belton	100%	2,780	0
City of Gatesville	10176002	2.2	Lake Belton	100%	1,731	0
City of Gatesville	10176004	1.0	Lake Belton	100%	703	0
City of Granbury	10178002	2.0	Granbury System	100%	1313	0

Name	TPDES Permit Number	Permitted Discharge (mgd)	Current BRA Source	Percent of SW from BRA	Current Surface Water Returns (ac-ft/yr)	Current Ground-water Returns (ac-ft/yr)
City of Lampasas	10205002	1.5	Lake Stillhouse Hollow	100%	580	0
City of McGregor (South WWTP)	10219002	0.99	Lake Belton	95%	651.7	0
City of Moody	10225001	0.2	Lake Belton	100%	157	0
Authority/LCRA BCRWSS West	10264001	3.0	Georgetown/Still -house System	100%	2,402	1,657
Authority/LCRA BCRWSS East	10264002	21.5	Georgetown/Still -house System	100%	16,767	0
City of Taylor	10299001	4.0	Granger System	100%	2,220	0
Bell County WCID#1	10351001	0.9	Lake Belton	100%	983	0
Bell County WCID#1	10351002	18.0	Lake Belton	100%	14,123	0
Bell County WCID#1	10351003	6.0	Lake Belton	100%	5,389	0
City of Brenham	10388001	3.55	Lake Somerville	100%	2,485	0
City of Dublin	10405001	0.45	Lake Proctor	100%	325	0
City of Georgetown	10489002	2.5	Georgetown/Still -house System	100%	1,815	0
City of Georgetown	10489003	2.5	Georgetown/Still -house System	100%	1,423	0
City of Georgetown	10489005	1.5	Georgetown/Still -house System	100%	1,389	0
City of Hamilton	10492002	0.44	Lake Proctor	100%	392	0
City of Hillsboro	10630001	1.81	Lake Aquilla	100%	1,440	0
City of Rosebud	10731001	0.25	Lake Stillhouse Hollow	100%	194	0
Bell County WCID#3	10797001	0.675	Lake Belton	100%	360	0
City of Holland	10897001	0.2	Lake Stillhouse Hollow	100%	93	0
Bell County WCID#2	11090001	0.094	Lake Belton	100%	63	0
Bell County WCID#2	11091001	0.08	Lake Belton	100%	70	0
Authority TBRSS	11318001	10.0	Lake Belton	100%	8,523	0

Name	TPDES Permit Number	Permitted Discharge (mgd)	Current BRA Source	Percent of SW from BRA	Current Surface Water Returns (ac-ft/yr)	Current Ground-water Returns (ac-ft/yr)
Acton MUD	14211001	0.6	Granbury System	100%	366	0
Acton MUD	14212001	0.49	Granbury System	100%	268	0
City of Comanche	14445001	0.6	Lake Proctor	100%	324	0

C. Unappropriated Water

The request for unappropriated water was incorporated into the TCEQ WAM as follows:

1) The Dual Simulation[1] approach was used. For each existing BRA authorization:
   a) Water rights activated only in the initial simulation represent existing diversions and storage authorized by the BRA's senior rights. These water rights calculate the total depletions and storage.
   b) Water rights activated during the second simulation calculate the depletion for the senior rights limited by the streamflow depletion in the preceding step.
   c) The final depletions are stored at a virtual control point until the priority date of the System Operation Permit application (October 15, 2004), and
   d) BRA's reservoirs are refilled using a priority date of October 15, 2004, with the stored final depletions. Any remaining water is returned to the stream at the control points of the BRA's existing water rights.

2) TCEQ Resource Protection Staff recommendations for instream flow protection were incorporated into the Brazos WAM at the priority date of the application as follows:
   a) Seasonal flow requirements were converted to monthly values in acre-feet.
   b) The instream flow requirements were subtracted from the seasonal pulse values to determine the incremental HFP (high flow pulse).
   c) The incremental HFP was multiplied by the seasonal pulse frequency to determine the total pulse volume for each season.
   d) The total pulse volume for each season was distributed by month
   e) The monthly pulse volume was added to the monthly instream flow volume for each flow regime to determine the WAM instream flow constraint for each month for each flow regime, and
   f) 7Q2 flows for the additional control points were converted to an annual value in acre-feet and added to the model.
   g) Based on a distribution of the annual diversion amount to a monthly value in WAM and conversion of that value to a daily diversion in cfs, staff determined that the diversion rate for BRA's diversions would be below 7,535 cfs at USGS Gage 08114000, Brazos River near Richmond.

3) After applying the instream flow constraints, the new appropriation of water was then included in the

[1] For additional explanation of Dual Simulation, see Wurbs, Ralph A. 2007. *Water Rights Analysis Package (WRAP) Modeling System Users Manual*. TR-256, Texas Water Resources Institute. College Station, Texas. Pp. 94-96.

second simulation (which generated the final results) as follows:

a) All BRA reservoirs are refilled with any unappropriated water at the priority date of this application.
b) Diversions are made, backed up by system storage in all BRA reservoirs, and
c) All BRA reservoirs are then refilled again to ensure that all water potentially available under the permit application is impounded.

To determine the amount of water available for appropriation, Staff first evaluated the applicant's request for firm water, i.e., that amount of water that would be available 100% of the time during the period of record. The request for firm water was modeled using the TCEQ Full Authorization simulation, which does not include return flows. Staff evaluated the requests for firm yield water at the three points requested in the application; from upstream to downstream being Glen Rose, Highbank and the Gulf of Mexico. The most downstream point for measurement of instream flow requirements is the Richmond gage. Staff calculated the amount of flow available to BRA at the Gulf of Mexico by determining the amount of flow available at the Richmond gage and applying a drainage area ratio relationship between the Richmond gage and the WAM control point representing the basin outlet at the Gulf of Mexico.

The analysis was conducted for two scenarios. The first simulation included Allens Creek Reservoir at its fully authorized amounts for storage and diversion, and was used to determine the amount of water available for appropriation after considering all water rights at their fully authorized amounts. The second simulation was conducted to determine if the water appropriated for Allens Creek Reservoir could be used more efficiently by the BRA, in conjunction with other water rights requested by this application, until such time as Allens Creek Reservoir is constructed. The amount of firm water available to BRA is indicated in Table 2. below. To the extent that removal of the requirement for wet season pulses at Richmond resulted in additional unappropriated water, staff recommended the additional amount.

The application requested an amount of additional water that would be available on a reasonably dependable basis. The application states that this water would be available if 90,000 acre-feet of firm water was used, along with other sources available to the applicant, to produce the additional supply. Pursuant to 30TAC §297.42(d), Staff may recommend granting applications that are not based upon the continuous availability of historic, normal stream flow on a case-by-case basis. A system operation in conjunction with other water rights is an application that may not be required to be based on the continuous availability of historic, normal streamflow. The applicant has requested that the additional amount of water be evaluated using the criteria in 30TAC §297.42(c), that is, 75% of the water is available 75% of the time when distributed on a monthly basis (75/75 criteria). Staff modeled this request using the Full Authorization simulation and included the applicant's estimated current return flows. Model results (Table 3.) indicate that additional amounts of water are available to the applicant using the 75/75 criteria.

Table 2. New Appropriation of Water (includes Allens Creek)

	Volume in acre-feet	
Location	**Firm**	**Non-Firm**
Glen Rose	131,363	157,000
Highbank	144,306	303,000
Richmond	188,470	670,000
Gulf of Mexico	191,516	670,000

Table 3. New Appropriation of Water (does not include Allens Creek)

	Volume in acre-feet	
Location	**Firm**	**Non-Firm**
Glen Rose	131,363	190,000
Highbank	175,306	284,000
Richmond	237,920	869,000
Gulf of Mexico	241,765	869,000

No Injury Review

The application requests authorization for operational flexibility to use any source of water available to BRA to satisfy the diversion requirements of senior water rights to the same extent that those water rights would have been satisfied by passing inflows through the BRA's reservoirs on a priority basis. The new authorization requested in this permit has a priority date junior to most basin water rights. Although changes in operations for BRA's existing water rights resulting from additional operational flexibility have the potential to affect river flows in the Brazos River and its tributaries, Staff is of the opinion that implementation of accounting measures should mitigate any impacts to senior and superior water rights. These accounting measures should be part of the accounting/delivery plan, which should be included in the WMP.

The application requests authorization to release, pump and transport water from any of the BRA's reservoirs for subsequent storage, diversion and use throughout the BRA's service area. The request to release, pump and transport stored water should have no effect on other basin rights so long as BRA obtains the appropriate bed and banks authorizations as needed. In addition, special conditions requiring BRA to maintain an accounting of water in storage by priority date should mitigate any impacts to downstream senior and superior water rights.

The application requests that the Commission recognize that the System Operation Permit will prevail over inconsistent provisions in the BRA's existing water rights regarding system operation. This would include existing limitations on the percentage of reservoir storage allowed to be used in system operations and identification of sources of supply. Specifically, the existing system operation order requires the BRA to exclude tributary reservoirs from operation of the system during any period of time in which BRA's permitted storage space is less than 30% full. The application states that the Commission's review and approval of the BRA's Management Plan will provide equivalent safeguards and, at the same time, allow the BRA greater operational flexibility. Staff agrees that there may be inconsistent provisions and recommends special conditions to clarify inconsistencies while protecting other basin water rights.

Conclusion

Based on the review and analysis of this application, staff can support granting the application provided the permit contains the special conditions proposed by Resource Protection staff and additional special conditions as indicated below.

A. Interbasin Transfer and Bed and Banks

The water requested for exempt interbasin transfer will be authorized with a priority date of October 15, 2004 and as such will be among the most junior rights in the Brazos River Basin. Therefore, there can be

no effects on existing water rights and staff can recommend granting this request.

Staff can recommend authorization for the use of the bed and banks of streams already authorized in BRA's current permits, certificates and amendments, subject to identification of specific losses. Staff recommends that the permit contain the following special conditions:

1. The use of the bed and banks of Allens Creek from below Allens Creek Reservoir to the Brazos River is not authorized until Permittee applies for and is granted an amendment to Permit 2925A.

2. Permittee is authorized to use the following reaches, authorized in Permittee's certificates and amendments, for conveyance of water, previously appropriated to the Permittee and water authorized by this permit, downstream for diversion at Glen Rose, Highbank and the Gulf of Mexico and any of the Permittee's currently authorized diversion points within these reaches:
   A. Brazos River from below Possum Kingdom Reservoir to the Gulf of Mexico
   B. Leon River from Lake Proctor to the confluence with the Little River
   C. Lampasas River from Lake Stillhouse Hollow to the confluence with the Little River
   D. Little River from the junction of Leon and Lampasas Rivers to the confluence with the Brazos River
   E. Yegua Creek from Lake Somerville to the confluence with the Brazos River
   F. Navasota River from Lake Limestone to the confluence with the Brazos River

3. Prior to use of the bed and banks identified in Special Condition A.2. above, Permittee must submit to and have approved by the Executive Director, as part of its accounting/delivery plan, a procedure to estimate daily deliveries of water. This procedure should be in electronic format and detail by source, type and priority date, the amounts to be conveyed and delivered, losses associated with the conveyance, specific points of diversion, associated travel times, and times of commencement and termination of transit for conveyed waters. Documentation of actual deliveries as well as the accounting/delivery plan shall be maintained by the Permittee in electronic format and made available to the general public during normal business hours and to the Executive Director upon request. Modifications or changes to the accounting/delivery plan must be approved by the Executive Director.

4. The use of the bed and banks of additional streams and tributaries in the Brazos River Basin for conveyance of water appropriated under this permit, or other sources available to the Permittee, is subject to Permittee, after identifying specific sources and types of water, specific points of discharge and diversion, and conveyance and other losses, obtaining future authorizations to satisfy the requirements of TWC § 11.042.

5. The use of additional points of diversion within the reaches specified in Special Condition A.2. above is subject to Permittee, obtaining authorization to use those diversion points. The points of diversion may also be identified and included in Permittee's proposed WMP which is subject to Commission approval.

B. Reuse of Return Flows

Staff can recommend granting BRA authorization to reuse return flows discharged from BRA facilities or originating from diversions under BRA's water rights, as indicated in Table 1. above, subject to the following special conditions to protect water rights granted based on the presence of those return flows as

well as other senior water rights:

1. Prior to the diversion of return flows authorized by this permit, Permittee must submit to and have approved by the Executive Director, a reuse accounting plan. The reuse accounting plan must be in electronic format and account, by source, for all return flows discharged and subsequently diverted. The reuse accounting plan should include amounts discharged by outfall, amounts of return flows used by permits granted based on the presence of these return flows, and estimated travel times and conveyance losses from discharge point to diversion point(s). If the return flows will be stored in Permittee's reservoirs, the reuse accounting plan should include any evaporative losses associated with the storage. Permittee shall maintain the approved reuse accounting plan in electronic format and make it available to the general public during normal business hours and to the Executive Director upon request. Modifications or changes to the reuse accounting plan must be approved by the Executive Director. The reuse accounting plan shall be included as part of Permittee's accounting/delivery plan.

2. The right to divert discharged return flows from plants owned by the City of Granbury (TPDES Permit No. 10178002), Acton MUD (TPDES Permit Nos. 14211001 and 14212001), Bell County WCID #2 (TPDES Permit No. 11090001), City of Georgetown (TPDES Permit Nos. 10489002 and 10489003) and the City of Holland (TPDES Permit No. 10897001) is limited to the amount of surface water based return flows discharged from those plants that originates from water rights owned by the Permittee. Permittee is not authorized to divert groundwater based return flows discharged from these plants, except as may be authorized by Special Condition B.4.. Permittee must include in the reuse accounting plan the total amount discharged from the plants and the percentage of that water that is divertable under this permit.

3. Permittee is authorized to divert historically discharged groundwater based return flows from the Brazos River Authority/LCRA BCRWSS West (TPDES Permit No. 10264001).

4. Future discharges of groundwater based return flows may be diverted if those return flows originate from groundwater owned by Permittee or are discharged from treatment plants owned by the Permittee. Prior to diversion, Permittee must apply for and be granted an amendment to this permit authorizing these diversions and shall submit for approval by the Executive Director, a revised accounting/delivery plan addressing such new groundwater based discharges.

5. Permittee is authorized to divert only that water discharged by the City of Marlin (TPDES Permit No. 10110002) originating from water rights owned by the Permittee. Permittee shall calculate the divertable amount of the City's discharge and include this information in the reuse accounting plan.

6. Permittee shall only divert the actual annual amount of return flows discharged from the Bell County WCID #1 (TPDES Permit Nos. 10351001 and 10351002) and the City of Harker Heights (TPDES Permit No. 10155001) less up to 172 acre-feet as authorized by Permit 4218, 37 acre-feet as authorized by Permit 5088 and 60 acre-feet as authorized by Permit 5089 when the aforementioned permits are being used.

7. Diversions and storage of return flows shall not occur at rates or in amounts higher than the actual daily amount of return flows discharged into watercourses in the Brazos River Basin, after accounting for the calculated losses and travel time from the discharge point(s) to the diversion point(s) in accordance with the accounting/delivery plan.

8. Prior to diversion of the water authorized herein, if sufficiently accurate measuring devices are not available, Permittee shall install and maintain measuring device(s) capable of measuring within plus or minus 5% accuracy, at the discharge point of each wastewater treatment plant (WWTP) to record the amount of return flows discharged into the Brazos River or its tributaries on a daily basis.

9. The priority date for diversion of up to 116,434 acre-feet (103.899 mgd) of return flows is October 15, 2004.

10. The priority date for diversion of future return flows in excess of 116,434 acre-feet (103.899 mgd) of discharged return flows is October 15, 2004 but is not subject to call by senior and superior permit holders in the basin and is not subject to instream flow limitations.

11. Prior to diversion of any return flows in excess of the individual TPDES Permit limits indicated in the Table 1. Return Flows Available to BRA, Permittee must apply for and be granted the right to reuse those return flows. Permittee must amend the reuse accounting plan to include future return flows prior to diverting said return flows.

12. The diversion of up to 116,434 acre-feet (103.899 mgd) of water is dependant upon potentially interruptible return flows or discharges and is conditioned on the availability of those discharges. The right to divert the discharged return flows is subject to revocation if discharges become permanently unavailable for diversion and may be subject to reduction if the return flows are not available in quantities and qualities sufficient to satisfy the permit. Should any of the discharges become permanently unavailable for diversion, Permittee shall immediately cease diversion of those return flows and reflect such reductions in the reuse accounting plan.

13. Permittee's diversion and use of return flows is subject to interruption by direct use or indirect use within the discharging entity's corporate limits, extraterritorial jurisdiction, or contiguous water certificate of convenience and necessity boundary, provided the discharging entity has applied for and been granted authorization to reuse the return flows.

C. Unappropriated Water

Staff can recommend granting reduced amounts of unappropriated water as follows:

Table 4. New Appropriation of Water

	Volume in acre-feet	
Location	**Firm Water**	**Non-Firm Water**
Glen Rose	131,363	157,000
Highbank	144,306	303,000
Richmond	188,470	670,000
Gulf of Mexico	191,516	670,000

Table 5. New Appropriation of Water (does not include Allens Creek)

	Volume in acre-feet	
Location	**Firm**	**Non-Firm**
Glen Rose	131,363	190,000
Highbank	175,306	284,000
Richmond	237,920	869,000
Gulf of Mexico	241,765	869,000

In order to ensure that existing basin rights are protected, the following special conditions should be included in the permit:

1. Prior to diversion or storage of the additional water authorized by this permit, Permittee shall provide to and have approved by the Executive Director, a daily accounting/delivery plan that includes, at minimum, the following:
    a. The accounting/delivery plan shall address reservoir storage and withdrawal plans for each system reservoir and account by priority date and amounts for any inflows, evaporation, water in storage and diversions from the reservoirs under all of Permittee's priority dates and authorizations including reuse.
    b. A method to account for inflows to system reservoirs for purposes of compliance with special conditions requiring passage of pulse flows and estimation of those inflows.
    c. An accounting of instream flow and pulse requirements to include total system storage, gage flows at the measurement points, high flow pulse volume impounded and the release schedule for the impounded high flow pulse, and timing, magnitude and duration of pulse flows.
    d. The accounting/delivery plan must detail how measurements will be taken to determine if impoundment or diversions under either Permittee's senior or junior rights can be made.
    e. The accounting/delivery plan must identify, account for, and distinguish between firm and non-firm water supplied or delivered from Permittee's system of reservoirs. In addition, the accounting/delivery plan must specify diversion points for this water if those diversion points are not specifically identified in this permit. Any additional diversion points must be within the reaches where use of the bed and banks is authorized. Any diversion points outside those reaches will require an amendment to this permit.
    f. Permittee shall maintain the approved daily accounting/delivery plan in electronic format and make it available to the general public during normal business hours and to the Executive Director upon request. Modifications or changes to the plan must be approved by the Executive Director.

2. If the total amounts of firm water indicated above are diverted at Glen Rose or Highbank, the additional amount of firm water available below those points is reduced accordingly. Permittee shall include the amount of that reduction in the accounting/delivery plan.

3. The full additional amount of non-firm water is only available when the amount of firm water is reduced by 90,000 acre-feet at Glen Rose, Highbank and the Gulf of Mexico. If less than the full amount of non-firm water is used, the amount of the firm water reduction shall be adjusted proportionately.

4. The non-firm water authorized above includes 74,387 acre-feet of historically discharged return flows. A reduction in firm yield water is not required in order to divert these return flows

5. The remaining 42,047 acre-feet of return flows out of the total amount of 116,434 acre-feet of return flows (Table 1.) may be diverted by the Permittee so long as the total diversions under this permit for all of the authorizations do not exceed the amounts of firm water and non-firm water indicated in Tables 4. and 5., above unless Permittee applies for and is granted the authorization to divert additional amounts of water.

6. Permittee may not exercise a priority call on water rights in the Brazos River Basin with priority dates senior to October 15, 2004 for purposes of increasing storage in and/or diversion from Permittee's system reservoirs where drawdown of Permittee's system reservoirs is caused by compliance with the terms and conditions of this permit.

7. The request for operational flexibility to use any source of water available to Permittee to satisfy the diversion requirements of senior water rights to the same extent that those water rights would have been satisfied by passing inflows through the Permittee's system reservoirs on a priority basis is limited as follows:
    a. To water previously stored in Permittee's reservoirs as documented in the accounting/delivery plan required in Special Condition C.1. above.
    b. Use of this option shall not cause Permittee to be out of compliance with Special Condition C.1. and Special Condition C.6.

8. Permittee may divert water from storage in its permitted reservoirs and store that water in Permittee's other reservoirs for use within the Permittee's service area so long as all diversions and storage are included in and comply with the provisions of the accounting/delivery plan and Special Condition C.1. above.

9. The total amount of water diverted and released from Permittee's system reservoirs in any year for each authorized purpose of use may not exceed the cumulative authorized total for each purpose until Permittee applies for and is granted amendments to the underlying authorizations.

10. Permittee is required to comply with the existing System Operation Order and certificates of adjudication requiring Permittee to exclude tributary reservoirs from operation of the system during any period of time in which Permittee's permitted storage space in that reservoir is less than 30% full (until all system reservoirs are below 30% capacity, at which time the reservoir can resume system operation), until such time as Permittee submits, and the Commission approves, a WMP for the Brazos River Basin which details how such limitations will be altered. Any alterations to the limitations must be in compliance with the accounting provisions required in Special Condition C.1 above.

11. Until such time as the ports are closed on the dam impounding Allens Creek Reservoir, authorized by Permit 2925, Permittee may impound and divert additional unappropriated water as specified in Table 5. subject to Special Conditions C.1. through C.10. above.

12. Permittee shall prepare and submit to the Commission, a Water Management Plan (WMP) which shall include such studies and other information as may be required by the Commission to demonstrate Permittee's compliance with and its ability to comply with all of the Special Conditions included in this permit.

13. The initial proceedings to consider the adoption of the WMP, and any major amendment thereof, shall be pursuant to contested case procedures. Any proceeding to consider the adoption or major amendment of the WMP shall be preceded by notice and opportunity to request a hearing, in accordance with the Commission's regulations applicable to water rights permitting proceedings. The WMP shall provide an adaptive management strategy for water supply and thus may be amended from time to time upon the request of Permittee or on the Commission's own motion. The initial accounting/delivery plan shall be submitted as part of the WMP.

Kathy Alexander, Hydrologist

Texas Commission on Environmental Quality

INTEROFFICE MEMORANDUM

To: Ron Ellis, Application Manager
Water Rights Permitting Team

February 9, 2010

From: Kathy Alexander, Hydrologist
Surface Water Availability & Interstate Compacts Team

Subject: Brazos River Authority
WRPERM 5851
CN600506794
Brazos River, Brazos River Basin

WATER AVAILABILITY ANALYSIS ADDENDUM

The hydrology memorandum was completed November 25, 2008 and a draft permit was sent to the applicant on December 1, 2008. The Brazos River Authority (BRA) submitted additional information on August 6, 2009 and August 13, 2009. The proposed changes include, among others:

- Additional clarifying language regarding BRA's previous system operation order
- Specification that the request for bed and banks authorization only applies downstream of Lake Possum Kingdom
- Clarification that storage and diversion of return flows is subject to environmental flow requirements
- Clarification that diversion points, in addition to those specifically requested in the application, will be included in the Commission approved Water Management Plan (WMP)
- Additional reaches below BRA's reservoirs in the bed and banks authorization
- Specification that the WMP include a mechanism for determining the amounts of firm and non-firm water at specific locations in the basin
- Specific timelines for submission and approval of the WMP, and specific items that should be included in the application for consideration and approval of the initial WMP
- A Special Condition relating to the method used to extend environmental flow requirements below the Richmond Gage
- Recognition of TPWD's right to petition the Commission to amend the WMP provisions related to environmental flow protection.
- Removal of a special condition in the previous draft permit allowing diversion of wet season pulses at the Richmond Gage when the diversion rate was below a specified level. BRA indicated that this issue would be addressed during consideration of the WMP.
- An additional measurement point for 7Q2 values.

In addition, the City of Granbury and Acton MUD provided comments on the volume of return flows discharged from their treatment plants that originate from BRA's water rights.

Water Availability Analysis

The Commission's Water Availability Model (WAM) for the Brazos River Basin protects existing water rights based on the prior appropriation doctrine. The period of record for the Brazos WAM is 1940 through 1997. The application was declared administratively complete on October 15, 2004. The model was updated to include an additional measurement point for water quality protection, to reduce the volume of return flows historically discharged by Acton MUD and the City of Granbury that are available to BRA, and to include a limitation on diversions at Richmond during wet season high flow pulses. (For specific numeric values for the flow requirements, refer to the Resource Protection Staff memos dated November 25, 2008 and February 9, 2010:

A. *Bed and Banks*

The authorization to use the bed and banks of the Brazos River and its tributaries is limited to reaches below Lake Possum Kingdom. The following additional reaches below BRA's system Reservoirs should be included in the permit:

- San Gabriel River from Lake Granger to the confluence with the Little River and downstream to its confluence with the Brazos River
- North Fork San Gabriel River from Lake Georgetown to the confluence with the San Gabriel River, to its confluence with the Little River and downstream to its confluence with the Brazos River
- Aquilla Creek from Lake Aquilla downstream to its confluence with the Brazos River

B. *Return Flows*

The Current Conditions data set was updated with the amount of current return flows, adjusted for reductions in the amount of return flows discharged by Acton MUD and the City of Granbury that are available to BRA (72,811 acre-feet, which is the sum of the maximum reported annual discharge amounts for each plant). The adjusted amounts are updated in Table 1. below. The request to reuse return flows was modeled at the most downstream point in the basin to determine the volume of return flows available to BRA on a basin-wide basis. Results indicate that 100% and 75% of the return flows were available in 45% and 81% of the years in the period of record, respectively, and the monthly amount of discharged return flows was available in 87% of the months.

Table 1. Return Flows Available to BRA

Name	TPDES Permit Number	Permitted Discharge (mgd)	Current BRA Source	Percent of SW from BRA	Current Surface Water Returns (ac-ft/yr)	Current Ground-water Returns (ac-ft/yr)
Sportsmans World MUD WTP	02461000	0.800	Possum Kingdom	100%	11.2	0
Double Diamond	02789000	0.060	Possum Kingdom	100%	67	0
Authority SWATS	02889000	2.500	Granbury System	100%	730	0
City of Copperas Cove	10045003	2.500	Lake Belton	100%	923	0
City of Copperas Cove	10045004	2.500	Lake Belton	100%	1,375	0
City of Copperas Cove	10045005	4.000	Lake Belton	100%	1,600	0
City of DeLeon	10078001	0.295	Lake Proctor	100%	192	0
City of Marlin	10110002	2.000	Whitney System	16%	159.4	0
City of Harker Heights	10155001	3.000	Lake Belton	100%	2,780	0
City of Gatesville	10176002	2.200	Lake Belton	100%	1,731	0
City of Gatesville	10176004	1.500	Lake Belton	100%	703	0
City of Granbury	10178002	2.000	Granbury System	23%	302	1,011
City of Lampasas	10205002	1.500	Lake Stillhouse Hollow	100%	580	0
City of McGregor (South WWTP)	10219002	1.100	Lake Belton	95%	651.7	0
City of Moody	10225001	0.200	Lake Belton	100%	157	0
Authority/LCRA BCRWSS West	10264001	3.000	Georgetown/Still -house System	100%	2,402	1,657
Authority/LCRA BCRWSS East	10264002	21.500	Georgetown/Still -house System	100%	16,767	0
City of Taylor	10299001	4.000	Granger System	100%	2,220	0
Bell County WCID#1	10351001	0.900	Lake Belton	100%	983	0
Bell County WCID#1	10351002	18.000	Lake Belton	100%	14,123	0
Bell County WCID#1	10351003	6.000	Lake Belton	100%	5,389	0
City of Brenham	10388001	3.550	Lake Somerville	100%	2,485	0

Name	TPDES Permit Number	Permitted Discharge (mgd)	Current BRA Source	Percent of SW from BRA	Current Surface Water Returns (ac-ft/yr)	Current Ground-water Returns (ac-ft/yr)
City of Dublin	10405001	0.450	Lake Proctor	100%	325	0
City of Georgetown	10489002	2.500	Georgetown/Still -house System	100%	1,815	0
City of Georgetown	10489003	2.500	Georgetown/Still -house System	100%	1,423	0
City of Georgetown	10489005	3.000	Georgetown/Still -house System	100%	1,389	0
City of Hamilton	10492002	0.880	Lake Proctor	100%	392	0
City of Hillsboro	10630001	1.810	Lake Aquilla	100%	1,440	0
City of Rosebud	10731001	0.250	Lake Stillhouse Hollow	100%	194	0
Bell County WCID#3	10797001	0.675	Lake Belton	100%	360	0
City of Holland	10897001	0.200	Lake Stillhouse Hollow	100%	93	0
Bell County WCID#2	11090001	0.094	Lake Belton	100%	63	0
Bell County WCID#2	11091001	0.160	Lake Belton	100%	70	0
Authority TBRSS	11318001	10.000	Lake Belton	100%	8,523	0
Acton MUD	14211001	0.600	Granbury System	11%	40	326
Acton MUD	14212001	0.820	Granbury System	11%	29	239
City of Comanche	14445001	0.595	Lake Proctor	100%	324	0

C. *Unappropriated Water*

The TCEQ WAM was updated to add an additional measurement point for water quality protection flows, limit BRA's diversions during wet season pulses at the Richmond Gage, and include a reduction in the amount of return flows considered as part of the non-firm water available to BRA.

To determine the amount of water available for appropriation, Staff first evaluated the applicant's request for firm water, i.e., that amount of water that would be available 100% of the time during the period of record. The request for firm water was modeled using the TCEQ Full Authorization simulation, which does not include return flows. Staff evaluated the requests for firm yield water at the three points requested in the application; from upstream to downstream being Glen Rose, Highbank and the Gulf of Mexico. The most downstream point for measurement of instream flow requirements is the Richmond Gage. Staff calculated the amount

of flow available to BRA at the Gulf of Mexico by determining the amount of flow available at the Richmond Gage and applying a drainage area ratio relationship between the Richmond Gage and the WAM control point representing the basin outlet at the Gulf of Mexico.

The analysis was conducted for two scenarios. The first simulation included Allens Creek Reservoir at its fully authorized amounts for storage and diversion, and was used to determine the amount of water available for appropriation after considering all water rights at their fully authorized amounts. The second simulation was conducted to determine if the water appropriated for Allens Creek Reservoir could be used more efficiently by the BRA, in conjunction with other water rights requested by this application, until such time as Allens Creek Reservoir is constructed. The amount of water available to BRA is indicated in Tables 2. and 3. below.

The application requested an amount of additional water that would be available on a reasonably dependable basis. The application states that this water would be available if 90,000 acre-feet of firm water was used, along with other sources available to the applicant, to produce the additional supply. Pursuant to 30TAC §297.42(d), Staff may recommend granting applications that are not based upon the continuous availability of historic, normal streamflow on a case-by-case basis. A system operation in conjunction with other water rights is an application that may not be required to be based on the continuous availability of historic, normal streamflow. BRA requested that the additional amount of water be evaluated using the criteria in 30TAC §297.42(c), that is, 75% of the water is available 75% of the time when distributed on a monthly basis (75/75 criteria). Staff modeled this request using the Full Authorization simulation and included the applicant's estimated current return flows.

Table 2. New Appropriation of Water (includes Allens Creek)

	Volume in acre-feet	
Location	**Firm**	**Non-Firm**
Glen Rose	131,363	157,000
Highbank	144,306	303,000
Richmond	188,005	670,000
Gulf of Mexico	191,044	670,000

Table 3. New Appropriation of Water (does not include Allens Creek)

	Volume in acre-feet	
Location	**Firm**	**Non-Firm**
Glen Rose	131,363	190,000
Highbank	175,306	284,000
Richmond	237,920	869,000
Gulf of Mexico	241,765	869,000

No Injury Review

The application requests that the Commission recognize that the System Operation Permit will prevail over inconsistent provisions in the BRA's existing water rights regarding system

operation. This would include existing limitations on the percentage of reservoir storage allowed to be used in system operations and identification of sources of supply. Specifically, the existing system operation order requires the BRA to exclude tributary reservoirs from operation of the system during any period of time in which BRA's permitted storage space is less than 30% of the full capacity of the reservoir. The application states that the Commission's review and approval of BRA's Water Management Plan will provide equivalent safeguards and, at the same time, allow BRA greater operational flexibility. Staff agrees that there may be inconsistent provisions and recommends special conditions to clarify inconsistencies while protecting other basin water rights. In addition, staff does not believe that inclusion of specific timelines and content requirements for the WMP would harm other water rights in the Brazos River Basin.

Conclusion

Based on the review and analysis of BRA's August 6, 2009 and August 13, 2009 submittals, staff recommends the following modifications to the previous draft permit.

A. Interbasin Transfer and Bed and Banks

In lieu of Special Condition 6.B.2, substitute the following:

2. Permittee is authorized to use the following reaches, authorized in Permittee's certificates and amendments, for conveyance of water, previously appropriated to the Permittee and water authorized by this permit, downstream for diversion at Glen Rose, Highbank and the Gulf of Mexico and any of the Permittee's currently authorized diversion points within these reaches:
    a) Brazos River from below Lake Possum Kingdom to the Gulf of Mexico
    b) Leon River from Lake Proctor to the confluence with the Little River
    c) Lampasas River from Lake Stillhouse Hollow to the confluence with the Little River
    d) Little River from the junction of Leon and Lampasas Rivers to the confluence with the Brazos River
    e) Yegua Creek from Lake Somerville to the confluence with the Brazos River
    f) Navasota River from Lake Limestone to the confluence with the Brazos River
    g) San Gabriel River from Lake Granger to the confluence with the Little River and downstream to its confluence with the Brazos River
    h) North Fork San Gabriel River from Lake Georgetown to the confluence with the San Gabriel River, to its confluence with the Little River and downstream to its confluence with the Brazos River
    i) Aquilla Creek from Lake Aquilla downstream to its confluence with the Brazos River

B. Reuse of Return Flows

Staff can recommend granting BRA authorization to reuse return flows discharged from BRA facilities or originating from diversions under BRA's water rights, as indicated in Table 1. above

so long as existing special conditions in the draft permit providing protection for water rights granted based on the presence of those return flows and protection of senior water rights are retained and the draft permit is modified as follows:

To provide additional clarification regarding the return flow accounting, substitute the following for Special Condition 6.A.1.:

1. Prior to the diversion of return flows authorized by this permit, Permittee must submit to and have approved by the Executive Director, a return flow accounting plan. The return flow accounting plan must be in electronic format and account, by source, for all return flows discharged and subsequently diverted. The return flow accounting plan shall include amounts discharged by outfall, amounts of return flows used by permits granted based on the presence of these return flows, estimated travel times and conveyance losses from discharge point to diversion point(s), and environmental flow requirements. If the return flows will be stored in Permittee's reservoirs, the return flow accounting plan should include any evaporative losses associated with the storage of these return flows. Permittee shall maintain the approved return flow accounting plan in electronic format and make it available to the general public during normal business hours and to the Executive Director upon request. Modifications or changes to the return flow accounting plan must be approved by the Executive Director. The return flow accounting plan shall be included as part of Permittee's accounting/delivery plan.

Clarify 6.A.9 to reflect that diversion of historically discharged return flows are subject to the recommended environmental flow requirements:

9. The priority date for diversion of up to 120,625 acre-feet (107.639 mgd) of return flows is October 15, 2004 and these return flows are subject to the environmental flow requirements in Special Condition 6.E.

C. Unappropriated Water

Staff recommends modification of the draft permit to reflect that the WMP will include a mechanism to determine the availability of firm and non-firm water at specific locations, reduction in the amount of return flows available to BRA, requirements for extending instream flow requirements below the Richmond Gage, and granting unappropriated water as follows:

Table 4. New Appropriation of Water

	Volume in acre-feet	
Location	**Firm Water**	**Non-Firm Water**
Glen Rose	131,363	157,000
Highbank	144,306	303,000
Richmond	188, 005	670,000
Gulf of Mexico	191,044	670,000

Table 5. New Appropriation of Water (does not include Allens Creek)

	Volume in acre-feet	
Location	**Firm**	**Non-Firm**
Glen Rose	131,363	190,000
Highbank	175,306	284,000
Richmond	237,920	869,000
Gulf of Mexico	241,765	869,000

In lieu of Special Condition 6.C.2.:

2. If the total amounts of firm water indicated in Paragraph 1.A.1 are diverted at Glen Rose or Highbank, the additional amount of firm water available below those points is reduced accordingly. The Water Management Plan shall include a mechanism for determining the amount of firm and non-firm water available at specific locations.

In lieu of Special Condition 6.C. 3

3. The full additional amount of non-firm water is only available when the amount of firm water is reduced by 90,000 acre-feet per year at Glen Rose, Highbank, Richmond and the Gulf of Mexico. If less than the full amount of non-firm water is used, the amount of the firm water reduction shall be adjusted pursuant to Special Condition 6.C.2.

In lieu of Special Condition 6.C.4 and 6.C.5:

4. The non-firm water authorized in Paragraph 1.A.1 includes 72,811 acre-feet of historically discharged return flows. A reduction in firm yield water is not required in order to divert these return flows

5. The remaining 47,814 acre-feet of return flows out of the total amount of 120,625 acre-feet of return flows, as specified in Paragraph 1.D., may be diverted by the Permittee so long as the total diversions under this permit for all of the authorizations do not exceed the amounts of firm water and non-firm water indicated in Paragraph 1.A.1. unless Permittee applies for and is granted the authorization to divert additional amounts of water.

Add an additional special condition relating to extension of flow requirements below the Richmond Gage

1. Prior to diversion of water authorized by this permit below USGS Gage 08114000, Brazos River at Richmond, Permittee shall submit to the Executive Director, for review and approval, a method to extend the requirements of 6.E.5 and 6.E.7 to or below the point of diversion.

C. Water Management Plan

Add additional special conditions related to timelines for submission and approval of the WMP, and specific items that should be included in the application for consideration and approval of the initial WMP:

1. An initial application for approval of the WMP shall be submitted to the Executive Director not later than three years after the date that this permit becomes final and non-appealable. Permittee shall take the necessary steps to ensure that the application for the WMP is administratively and technically complete within one year after the initial submission of the application to the Executive Director. Deadlines established in this provision may be extended by the Executive Director. At minimum, every ten years after approval of the initial WMP, Permittee shall submit to the Executive Director an application for reconsideration or amendment of the approved WMP.

2. The issues addressed in the initial application for approval of the WMP shall include, but not be limited to, the following:
   a. accounting/delivery plans (including return flow accounting plans)
   b. consideration of adding, deleting, or modifying the measurement points and flow levels described in 6.E.5 and 6.E.7.
   c. consideration of establishing diversion rate trigger levels for high flow pulse (HFP) requirements, included in 6.E.7, below which the requirements of 6.E.7 would not apply
   d. consideration of establishing maximum diversion rates for diversions of water authorized in this permit
   e. development of operational and accounting criteria, in addition to that specified in 6.A.1, 6.B.3, and 6.C.1., to address uncertainty in forecasting and accounting for HFPs in a manner that balances the risks and benefits between water supply and environmental flow protection
   f. consideration of revised storage triggers provided for in 6.E.3 and 6.E.4, and the process for recalculating those triggers
   g. alteration of 6.C.10 relating to capacity limitations on tributary reservoirs. Should the existing 30% limitation be modified for any of Permittee's system reservoirs, Permittee shall apply to amend the water right authorizing that reservoir
   h. establishment of a mechanism to determine the amount of firm and non-firm water available at specific locations
3. Upon notification to Permittee, TPWD may petition the Commission to amend any WMP provisions related to environmental flow protection.

Kathy Alexander, Hydrologist

Texas Commission on Environmental Quality

INTEROFFICE MEMORANDUM

To: Ronald Ellis, Application Manager
Water Rights Team
Water Rights Permitting & Availability Section

Date: November 25, 2008

Through: Chris Loft, Team Leader CL 12/1/08
Resource Protection Team
Water Rights Permitting & Availability Section

From: DG Dakus Geeslin, Aquatic Scientist
Resource Protection Team
11/25/08 Water Rights Permitting & Availability Section

Subject: Brazos River Authority
WRPERM 5851
CN600506794
RN104319736
Brazos River Basin

Environmental reviews of water right applications are conducted in accordance with §11.042, §11.147, §11.1491, §11.150, and §11.152 of the Texas Water Code and with TCEQ administrative rules which include 30 TAC §297.53 through §297.56. These statutes and rules require the TCEQ to consider the possible impacts of the granting of a water right on fish and wildlife habitat, water quality, and instream uses associated with the affected body of water. Possible impacts to bays and estuaries are also addressed.

APPLICATION SUMMARY

The Brazos River Authority has applied for a permit, designated its "System Operation Permit," to authorize: 1) appropriation of state water for multiple use purposes; 2) appropriation of current and future return flows; 3) an exempt interbasin transfer of the water requested; 4) operational flexibility; 5) recognition that the System Operation Permit will prevail over inconsistent provisions in its existing water rights; and 6) the use of the bed and banks of the Brazos River, its tributaries, and BRA's reservoirs for the storage, conveyance and subsequent diversion of state water appropriated pursuant to this application and from other sources.

The BRA owns the following water rights, which comprise BRA's system of reservoirs for the purposes of this application: Certificate of Adjudication (Certificate) No. 12-5155 (Possum Kingdom Lake), Certificate No. 12-5156 (Lake Granbury), Certificate No. 12-5165 (Lake Limestone),

Certificate No. 12-5157 (Lake Whitney), Certificate No. 12-5160 (Lake Belton), Certificate No. 12-5159 (Lake Proctor), Certificate No. 12-5164 (Lake Somerville), Certificate No. 12-5161 (Lake Stillhouse Hollow), Certificate No. 12-5163 (Lake Granger), Certificate No. 12-5162 (Lake Georgetown) and Certificate No. 12-5158 (Lake Aquilla). The BRA, along with the Texas Water Development Board and the City of Houston, owns Water Use Permit 2925A (Allens Creek Reservoir). The BRA also owns Certificate Nos. 5166 and 5167, which authorize various uses of water within the applicant's other certificates and permits.

The applicant is currently authorized, pursuant to a TCEQ order, to manage and operate its tributary reservoirs as elements of a system, coordinating releases and diversions from the tributary reservoirs with releases and diversions from the applicant's main-stem reservoirs to minimize waste, and to conserve water in reservoirs in which the supply is short by making releases from tributary reservoirs in which the supply is more abundant.

The applicant seeks a Water Use Permit to authorize:

1. A new appropriation of state water in the amount of 421,449 acre-feet per year for multiple use purposes, including domestic, municipal, agricultural, industrial, mining, and other beneficial uses on a firm basis in the Brazos River Basin. The amount of this new appropriation of water includes the current and future return flows requested in this application. BRA indicates that the entire amount of 421,449 acre-feet of water per year is available only if all of it is diverted at the mouth of the Brazos River, and can only be made available by the BRA through the system operation of its water rights. To the extent water is diverted upstream, the remaining unappropriated water downstream is reduced and will itself vary depending upon the location of its diversion and use. Out of the 421,449 acre-feet per year of unappropriated water being requested, the maximum amount of unappropriated water that will be available if such water is diverted upstream at USGS gage No. 08091000 near Glen Rose, Texas is 150,538 acre-feet per year firm, and if such unappropriated water is diverted upstream at USGS gage No. 08098290 near Highbank, Texas, the maximum amount of unappropriated water that will be available at that location is 144,306 acre-feet per year.

2. Diversion of the water authorized by this amendment, if granted, from: (i) the existing diversion points authorized by BRA's existing water rights; (ii) the Brazos River at the USGS gage No. 08091000 near Glen Rose, Texas; (iii) the Brazos River at USGS gage No. 08098290 near Highbank, Texas; (iv) the Brazos River at the Gulf of Mexico; and (v) at such other diversion points that may be identified and included in BRA's proposed Water Management Plan which is subject to TCEQ's approval.

3. Use of up to 90,000 acre-feet of water per year of its firm supply (part of the 421,449 acre-feet of firm water requested above) to produce, along with other unappropriated flows, an interruptible water supply of 670,000 acre-feet per year and the appropriation of that interruptible water supply. BRA indicates that the entire amount of 1,001,449 acre-feet of water (331,449 acre-feet of firm water and 670,000 acre-feet of interruptible water) is available only if all of it is diverted at the mouth of the Brazos River, and can only be made available by the BRA through the system operation of its water rights. To the extent water is diverted upstream, the remaining unappropriated water

downstream is reduced and will itself vary depending on the location of its diversion and use. This new appropriation of water includes the current and future return flows requested in this application. Out of the 1,001,449 acre-feet of firm and interruptible water being requested, the maximum amount of firm and interruptible water that will be available if such water is diverted upstream at USGS Gage No. 08091000 near Glen Rose, Texas is 60,538 acre-feet of firm water per year and 157,000 acre-feet of interruptible water per year and if such water is diverted upstream at USGS Gage No. 08098290 near Highbank, Texas, the maximum amount of firm water is 54,306 acre-feet of water per year and 303,000 acre-feet of interruptible water per year.

4. An exempt interbasin transfer authorization to transfer and use, on a firm and interruptible basis, such water in the adjoining San Jacinto-Brazos Coastal Basin and the Brazos-Colorado Coastal Basin, and to transfer such water to any county or municipality or the municipality's retail service area that is partially within the Brazos River Basin for use, on a firm and interruptible basis, in that part of the county or municipality and the municipality's retail service area not within the Brazos River Basin.

5. An appropriation of current and future return flows (treated sewage effluent and brine bypass/return) to the extent that such return flows continue to be discharged or returned into the bed and banks of the Brazos River, its tributaries, and applicant's reservoirs. BRA indicates that such appropriation of return flows would be subject to interruption by direct use or indirect use within the discharging entity's city limits, extraterritorial jurisdiction, or contiguous water certificate of convenience and necessity boundary. Specified discharge points and amounts of water will be accounted for on a monthly basis as part of BRA's Water Management Plan which is subject to TCEQ's approval.

6. Operational flexibility to (1) use any source of water available to the applicant to satisfy the diversion requirements of senior water rights to the same extent that those water rights would have been satisfied by passing inflows through the applicant's reservoirs on a priority basis; and (2) release, pump and transport water from any of the applicant's reservoirs for subsequent storage, diversion and use throughout the applicant's service area.

7. Recognition that the System Operation Permit approved pursuant to this application will prevail over inconsistent provisions in the applicant's existing water rights regarding system operation.

8. Use of the bed and banks of the Brazos River, its tributaries and the applicant's reservoirs for the conveyance, storage, and subsequent diversion of (i) water that the applicant seeks to appropriate under this application; (ii) waters that are being conveyed via pipelines and subsequently discharged into the Brazos River, its tributaries or stored in the applicant's reservoirs; (iii) surface water imported from areas located outside the Brazos River Basin for subsequent use; (iv) in-basin surface water and groundwater subject to the applicant's control;(v) waters developed from future applicant projects; and (vi) current and future reuse of surface and groundwater based effluent requested by this application. This bed and banks authorization is subject to applicant, after identifying specific points of discharge and diversion and conveyance and other losses, obtaining future authorizations to satisfy the requirements of TWC § 11.042. Such points of discharge and diversion and

conveyance and other losses may also be identified and included in BRA's proposed Water Management Plan which is subject to TCEQ's approval.

9. Until the construction of Allens Creek Reservoir is completed, the applicant requests that the System Operation Permit include special conditions which authorize:

A. The applicant to appropriate state water in the amount of 425,099 acre-feet per year for multiple use purposes, including domestic, municipal, agricultural, industrial, mining, and other beneficial uses on a firm basis in the Brazos River Basin. This amount includes the current and future return flows requested in this application. This amount is available if all of the water is diverted at the mouth of the Brazos River, and can only be made available by the BRA through the system operation of its water rights. To the extent water is diverted upstream, the remaining unappropriated water downstream is reduced and will itself vary depending upon the location of its diversion and use. Out of the 425,099 acre-feet per year of unappropriated water being requested, the maximum amount of unappropriated water that will be available if such water is diverted upstream at USGS Gage 08091000 near Glen Rose, Texas is 150,538 acre-feet per year firm and if such unappropriated water is diverted upstream at USGS Gage 08098290 near Highbank, Texas the maximum amount of unappropriated water that will be available is, at that location, 175,306 acre-feet per year firm;

B. The applicant to use up to 90,000 acre-feet of water per year of its firm supply to produce, along with other unappropriated flows an interruptible water supply of 869,000 acre-feet per year. This amount includes the current and future return flows requested in this application. BRA indicates that the entire amount of 1,204,099 acre-feet of water (335,099 acre-feet of firm water and 869,000 acre-feet of interruptible water) is only available if all of it is diverted at the mouth of the Brazos River, and can only be made available by the BRA through the system operation of its water rights. To the extent water is diverted upstream, the remaining unappropriated water downstream is reduced and will itself vary depending upon the location of its diversion and use. Out of the the 1,204,099 acre-feet of firm and interruptible water being requested, the maximum amount of firm and interruptible water that will be available if such water is diverted upstream at USGS Gage No. 08091000 near Glen Rose, Texas, will be 60,538 acre-feet of firm water per year and 190,000 acre-feet of interruptible water per year and if such water is diverted upstream at USGS Gage No. 08098290 near Highbank, Texas the maximum amount of firm water will be 85,306 acre-feet of water per year and 284,000 acre-feet of interruptible water per year; and

C. Exempt interbasin transfer authorization to transfer and use, on a firm and interruptible basis, such water in the adjoining San Jacinto-Brazos Coastal Basin and the Brazos-Colorado Coastal Basin, and to transfer such water to any county or municipality or the municipality's retail service area that is partially within the Brazos River Basin for use, on a firm and interruptible basis, in that part of the county or municipality and the municipality's retail service area not within the Brazos River Basin.

BRAZOS RIVER BASIN

The Brazos River is a Gulf Coast river of the southwestern United States. It traverses a strong rainfall gradient, decreasing from east to west, and a temperature gradient from north to south that

strongly influences vegetation, land use, and river flow (Dahm et al. 2005). The Brazos River is among the hundred longest rivers in the world. The Brazos River starts on the high plateau of the Texas Panhandle before passing through grasslands, prairies, savannahs, and forests (Dahm et al. 2005). The following is an excerpt from in *Rivers of North America* (Benke and Cushing 2005):

The Brazos River arises at the confluence of the Salt Fork and Double Mountain Fork and flows about 1390 km southeasterly across Texas to its mouth on the Gulf of Mexico southwest of Houston. The Brazos has the greatest channel length entirely within Texas and is the third longest of all Texas Rivers. Its drainage basin is about 115,600 km^2, with 94% in Texas. The Brazos heads in New Mexico, and its forks drain much of the southern panhandle, and parts of west Texas surrounding Lubbock, Texas, on the Llano Estacado. Both dry, hot summers and sudden icy winds and winter blizzards color and shape the landscape, and long cycles of drought often are devastating to inhabitants...

The Brazos flows through three physiographic provinces beginning with the Great Plains (GP) of the Texas panhandle and eastern New Mexico. The Brazos then passes through the Central Lowlands (CL), emerges back into the Great Plains, and then flows across the Coastal Plain (CP) province into the Gulf of Mexico. The Brazos also passes through six terrestrial ecoregions along its course: Western Short Grasslands, Central and Southern Mixed Grasslands, Central Forest/Grassland Transition Zone, Texas Blackland Prairies, East Central Texas Forests, and Western Gulf Coastal Grasslands...

Land use in the basin is a mix of grazing, agriculture, and urban development, with remnants of native vegetation throughout the region. The basin is approximately 57% grassland, 24$ cropland, 16% urban and suburban, and 3% forest...

The Brazos River shows varied geomorphic characteristics as it crosses Texas. The Upper Brazos of the high plains is generally a broad, shallow, sandy, spatially intermittent river in short grass country. Canyonlands exist at the breaks of the Llano Estacado and the Caprock escarpment. The Middle Brazos was relatively unspoiled until numerous dams were constructed in this section of the river beginning in the 1940s and continuing through the 1980s. Much of the Brazos was entrenched and confined in narrow valleys with steep sides or bluffs. Near Waco, the topography changes to gently rolling hills and the river is less constrained. The Lower Brazos of the Coastal Plain becomes a deep, broad river in agricultural lands. The Brazos starts at an elevation of 450 m above sea level and stream gradients diminish from 66 cm/km to 9 cm/km as the river flows from its headwaters to the mouth...

There have been some detailed geomorphic studies of the Brazos River...Migration rate [of meanders] has decreased substantially [from the 1930s to 1988] as regulated flows have diminished peak flows and reduced suspended sediment loads...

Mean discharge for the Brazos River is 249 m^3/s. Given the large size of the basin, however, runoff is quite low, ranging from only 0.2 cm/mo during the winter to 0.8 cm/mo in May. The annual total runoff of about 4 to 5 cm is only 5% of annual precipitation and indicates high evapotranspiration

and other losses. The discharge regime is strongly regulated by the dams upstream of Waco on both a daily and seasonal basis, with daily discharge commonly being reduced to <1 m^3/s below Lake Whitney Dam...

Water chemistry reflects the predominant marine clays, limestone and sandstone geology, and agricultural land use. Water is mildly alkaline and salty (pH 7.6, alkalinity 1.33 mg/L as $CaCO_3$, specific conductance 733 μS/cm) due to marine salts deposited in the region of the upper basin as an ancient inland sea evaporated. Nutrient loading (dairy farms) in the middle basin causes late summer algal blooms, especially in intermittent reaches. In recent years, toxic blooms of golden alga linked to nutrient loading in some reservoirs have caused multiple fish kills. Water quality parameters of primary concern in the basin include natural salinity, atrizine, perchlorate, phophorus, dairy wastes, and dissolved oxygen...

The Brazos River flows through the East Texas Gulf freshwater ecoregion. Unfettered by dams downstream of Waco, the rich biodiversity in the lower drainage is contained in habitats maintained by natural fluvial processes...Apart from Lake Brazos (formed by a low-head dam at Waco), the main stem of the Brazos in the lower basin flows freely for over 640 km to the Gulf of Mexico, due in part to the shallow gradient of the Coastal Plain. Wide meanders have formed many oxbow lakes at various distances from the present main stem of the river, which reflects their various histories of inundation, and reconnection to the river. The Brazos River, deprived of much of its sediments by many dams, has cut deeper into its channel, and less frequently reconnects with the oxbow lakes...

RECREATIONAL USES

Recreational Uses: The following information comes from *An Analysis of Texas Waterways* (TPWD, 1979):

The Brazos River has sufficient water for year-round recreational purposes downstream of its confluence with the Clear Fork in Young County. Few major hazards are found on the entire river. There are plenty of gravel bars and islands for stopping and camping in the upper portions of the river below Possum Kingdom Dam. Sand bars become more common downstream. The suitability of this section of the Brazos for recreational use depends upon water being generated from Possum Kingdom Dam. The water coming from the dam is cold and clear. A common occurrence for the river is the rising of 2 or 3 feet in a matter of minutes when the dam is generating. If the dam is not generating, the river is relatively shallow which results in the river being difficult to float. The 35-mile section of the Brazos River in Palo Pinto County is very similar to the preceding section. Cedar-covered hills and mountains, scenic vistas, and precipitous shorelines are still very much in existence. Vegetation along the river bank remains thick and water quality is relatively high. The river banks are clean and unpolluted. Many small islands lend themselves to camping and day use, and the number of sand bars increases as the river progresses downstream. Continuing downstream, the next 41-mile section in Palo Pinto and Hood Counties leaves the rough terrain of the Palo Pinto Mountains and flows through decreasingly rugged country enroute to Lake Granbury. The river becomes a slow, meandering stream with many bends and twists. However, the Brazos remains

scenic, flowing through rolling hills and wooded bottomlands of the Cross Timbers Area of North Central Texas. The river is very wide and in places is shallow, but recreational usage is possible during normal and above normal water levels almost year round. Sand bars are plentiful.

Flowing through Hood and Somerville Counties, this next 39-mile section of the Brazos River depends upon water being generated from De Cordova Bend Dam before recreational use is possible. During periods when the dam is not generating, water levels are shallow until the backwaters of Lake Whitney are reached. Water below the dam is clean and clear. The river along this section is very scenic, flowing through heavily vegetated rolling hills covered with cedar, live oak, and post oak. The river does not run swiftly, but meanders leisurely over sand and rocks. The Paluxy is a tributary of the Brazos and is a small but picturesque river which has potential for recreational use. Lake Whitney Recreational Area extends up the Brazos River from Lake Whitney for approximately 36 miles. Recreational use of the river for this 36-mile distance is feasible, giving a total length of approximately 66 miles of potential recreational waterway from De Cordova Bend Dam to Lake Whitney.

The 39-mile section of the Brazos River in Bosque, Hill, and McLennan Counties is scenic, with tree-lined banks periodically giving way to bluffs of sheer limestone. Springs located on this section create excellent water quality. The water temperature is very cold in the upper portion since it comes from the bottom of Lake Whitney. The river is wide with many deep holes of water. Unless Whitney Dam is generating, several shallow areas will be encountered on this section. The next 38.7-mile section in McLennan and Falls Counties begins its slow meandering trek to the Gulf, flowing through rolling hills and flat coastal terrain. An occasional high bluff is found although limestone outcroppings such as those present on the upper reaches are not present. The water is no longer clear, but is often a murky color; however, its quality is sufficient for water contact sports. The Brazos River is scenic and contains heavily vegetated banks. There is sufficient water for recreational use at all times although during periods of dry weather shallow areas are found. One dam, forming Lake Brazos in Waco, exists. Water releases are automatic, and when the lake goes above conservation pool, the spillway is opened to release water. Located in Falls, Milam, and Robertson Counties, this penultimate 28-mile section of the Brazos River is a scenic section suitable for recreational use at any time. The river is very wide and low water levels often create shallow areas. The scenery is similar to the previous section, containing high earthen banks and much vegetation. The river is sluggish and slow-moving with no existing rapids. However, Falls-on-the-Brazos is a small waterfall stretching across the river. A concrete low water crossing is also found at this site. If the water level is fairly high, the falls are navigable. The Brazos River throughout the lower sections is a very scenic coastal river. Here, the stream slowly meanders to the Gulf between wide, steep banks. The banks are lined with hardwood trees and many scenic bluffs and sand bars exist. Water levels for recreational use are sufficient year round.

FLOW REGIMES FOR RIVER ECOSYSTEMS

Over the past 20 years, scientific research on streamflows to support river ecosystems indicates that establishing streamflows only on the basis of fish needs may not be sufficient to fully protect ecosystem functions. Such a limited focus may result in insufficient flows to support the

maintenance of the stream channel, geomorphological processes, and riparian vegetation (Hill et al. 1991). Four flows are now widely recognized as important to river ecosystems: subsistence flows, base flows, high pulse flows, and overbank flows (National Research Council 2005). A body of scientific literature recognizes that this "environmental dynamism is central to sustaining and conserving native species diversity and ecological integrity in rivers and other ecosystems" (Poff et al. 1997) and that species have evolved life history strategies compatible with the flow regime in which they live and reproduce (Schlosser 1985, Meffe and Minckley 1987, Bunn and Arthington 2002). The Texas Instream Flow Program is based on these tenets of hydrologic variability and dynamism (TCEQ et al. 2008).

Magnitude, frequency, and duration of flow are critical factors for species recruitment, abundance, and survival. Base flows support diverse aquatic communities, maintain groundwater levels for riparian vegetation, provide connectivity for fish movement, maintain suitable temperature and water quality characteristics, and provide drinking water for terrestrial animals (Tennant 1976, Richter et al. 2003). While the emphasis has long been on providing critical or low flows, high flows transport sediment through the channel (Leopold et al. 1964). This sediment movement is integral to redistributing the organic resources on which many species depend (Fisher 1983). High-flow events, like low-flow events, may serve as ecological "bottlenecks" that present critical stresses and opportunities for riverine species (Poff and Ward 1989). In many systems, the relative composition and abundance of species often reflect the frequency and intensity of high flows (e.g., Bernardo et al. 2003, Agostinho et al. 2004). Finally, by connecting the channel to the floodplain, high flows also help maintain the productivity and diversity of adjacent riparian areas and wetlands and the terrestrial species that depend upon them (references in Poff et al. 1997). Removal or reduction of peak flows will impair floodplain functions, which can alter riparian and channel conditions that provide habitat for fish (Bayley 1995).

Bonner and Runyan (2007), found that the annual frequency of small and large flood events has decreased over time. Consequently, fish assemblages in the lower Brazos have also changed. Eight species that historically represented the majority of fish assemblages showed declining population trends over time. Species diversity also displayed declining trends as 80% of the fish assemblage collected in recent years is represented by two species. Bonner and Runyan also found declining populations of a sensitive fish and a candidate fish species for listing under the Endangered Species Act.

Bonner and Runyan (2007) also noted changes in reproductive guilds. Numerous open substrate spawning fish, which thrive in river systems with fluctuating stream flows, have given way to a more successful nest spawning fish more adaptable to fewer small and large flood events. This trend suggests that the decline in flood events over time has led to changes in the fish assemblage and in reproductive strategies. The study also notes that 38% of Texas freshwater fishes are considered imperiled, and states that a greater understanding of the relationships between discharge and species, and assemblage sustainability, is critical for proper management of water resources and native fishes. Assemblage changes appear predictable and possibly preventable with proper planning and management. Richter et al. (2003) indicate that biologically unique assemblages that

are already stressed (i.e. the lower Brazos River) can be maintained and even restored with techniques to balance water needs between humans and the riverine community.

Oxbow lakes are water bodies formed by meanders of a river which become cut off from the main river channel over time. Oxbows lakes are dependent on hydrologic connectivity with the parent river for water inflows, nutrients, and biological recruitment. High flow events and overbank flooding are essential flood regime components to supplement the unique ecological functionality of an oxbow lake. Winemiller et al. (2004) surveyed oxbow lakes along the Brazos River and examined responses of fish assemblages and individual species to hydrologic variability in channel and floodplain habitats of the lower Brazos River. Of the six oxbows surveyed, Hog Island Oxbow yielded the highest number of species, and species diversity, for seining surveys. Hog Island Oxbow showed more similarities to the Brazos River's fish assemblages due to its young age (formed in 1996) and its greater hydrologic connectivity to the river. This study also found that Hog Island Oxbow remained connected to the river channel at relatively low discharge when other oxbows were isolated, allowing for more frequent exchange of aquatic fauna. Osting et al. (2004) found that Hog Island Oxbow requires at least 1,570 cfs to become connected to the Brazos River. This is the lowest flow required of all oxbows that were studied.

Connectivity to the main river is an important hydrologic component for both oxbows and the river. Oxbows provide essential spawning and rearing habitat for fishes. Movement of fish from oxbows to the river and vice versa is dependent on periodic flooding associated with high flows. According to Winemiller et al.(2004, p.41): Modification of flow dynamics that yield oxbow formation and succession, or a reduction in floodplain connectivity would be expected to reduce fish productivity and biodiversity on multiple spatial scales. Findings from this study illustrate the importance of natural flow regimes for aquatic biota in the Brazos River system."

A goal of the recommendations presented herein is to reflect historical patterns of hydrological variability in the portions of the Brazos River Basin that may be affected by the proposed permit action. USGS streamflow data from six gauges in the basin were reviewed and the data was used in subsequent analyses to determine instream or environmental flow recommendations. It is understood that the current Texas Instream Flow Program study of the middle and lower reaches of the Brazos River will provide data that may more thoroughly address the question of how to determine instream flow needs than streamflow data can alone, but complete results are not available at this time. The approach taken in this permit review is consistent with the framework for implementing environmental flow components described in the technical guidance document for the Texas Instream Flow Program (TCEQ et al. 2008). The TIFP recognizes the range of climatic conditions that occur and influence hydrologic behavior. Instream flow recommendations contained herein are designed to reflect natural hydrologic and climatic variability by specifying flows that would occur under dry, average, or wet conditions (see below for further explanation). The six USGS gauges selected and the period of record corresponding to relatively unaltered flow in the Brazos River Basin are:

Brazos River near Glen Rose (1924 to 1940), USGS #08091000
Yegua Creek near Somerville (1925 to 1966), USGS #08110000
Navasota River near Easterly (1925 to 1969), USGS #08110500
Little River near Cameron (1917 to 1953), USGS #08106500
Brazos River at Richmond (1923 to 1959), USGS #08114000
Brazos River at Waco (1899 to 1940), USGS #08096500 used for Brazos River at Highbank, USGS #08098290. The Waco gauge values are being multiplied by 1.043, which represents the increase in the drainage area at the Highbank gauge over the Waco gauge.

Flow records from each of the gauges were analyzed using Indicators of Hydrologic Alteration (IHA, The Nature Conservancy) software. The IHA software uses a hydrologic time series to identify environmental flow components (e.g., low flows, high flow pulses, overbank flows) based on parameters such as rate of change of peak flows and flow recurrence interval that can be used in default mode or specified by the user. In the current application, IHA was used to identify low or "normal" flows. Seven-day, two-year low flows (7Q2 flows) were substituted for IHA's extreme low flows. Additional calculations were made outside of IHA using Excel to determine high flow pulses (HFP). Overbank flows were not considered for recommendation.

In this application, a HFP is defined as any contiguous series of daily flows that meet specific criteria such as the flow must be greater than the 10% percentile flow of the entire period of record, peak flow of the HFP must be less than the 1.5-yr recurrence interval, and if the flow exceeds the 75th percentile of the entire period of record it triggers a HFP, regardless of the rate of change from the previous day. A HFP ends if the flow drops below the 10th percentile of the entire period of record. Other conditions may also apply.

For a wet hydrologic condition, a qualifying HFP exceeds the 75th percentile of peak flow, 75th percentile of storm event volume, and 75th percentile of duration. For an average hydrologic condition, a qualifying HFP exceeds the 50th percentile of peak flow, 50th percentile of storm event volume, and 50th percentile of duration. For a dry hydrologic condition, a qualifying HFP exceeds the 25th percentile of peak flow, 25th percentile of storm event volume, and 25th percentile of duration. This approach is used to determine in near, real time HFPs provided by nature. IHA output was imported into Excel to further refine the computation of HFPs. The results were used to create tables of the 25th, 50th, and 75th percentiles of HFP event peak flows as well as the volume per event, the duration in days, and the frequency or number of events per season.

Total storage in System Reservoirs is proposed as a trigger for determining which of the instream flow requirements (i.e., dry, average or wet) are to be implemented at any given time and is subject to revision in future Water Management Plans. The approach is a statistical one in which percentiles of historical system storage are used as a proxy for climatic conditions. 7Q2 flows are intended to be implemented when total storage in System Reservoirs is below 60% of total capacity. The standard is intended to reflect the driest 2.5% of the historic record (on a monthly basis). "Dry" means times when the total storage in System Reservoirs is below 74%, but more than 60% of total capacity. This standard is intended to reflect the dry portion of the historic record from the 2.5th to the 25th percentile (on a monthly basis). "Average" means times when the total storage in System

Reservoirs is at least 74%, but less than 96% of total capacity. This standard is intended to reflect that 50% of the time when conditions are neither "Wet" nor "Dry." "Wet" means times when the total storage in System Reservoirs is at least 96% of total capacity. The standard is intended to reflect the wettest 25% of the historic record (on a monthly basis). Instantaneous instream flow requirements are applicable at all times, with the exception of extremely dry conditions at which time 7Q2 flows are in place.

On August 11, 2008 the applicant submitted supplemental information and requested removal of the recommended high flow pulse requirements if the diversion rate was at or below the rates as outlined in the following table:

Minimum Diversion Rate for Application of Qualifying HFP Criteria	
Measurement Point	Minimum Diversion Rate (cfs)
Brazos River near Glen Rose	3,446
Brazos River near Highbank	4,425
Brazos River near Richmond	7,535
Yegua Creek near Somerville	214
Little River near Cameron	1,498
Navasota River near Easterly	205

Resource Protection staff evaluated the request by comparing the requested diversion rate to the recommended high flow pulse requirements. The applicant's proposed diversion rates constitute a substantial amount of the high flow pulse recommendation at all locations, except Brazos River near Richmond during wet conditions. Many physical features of a river or stream that provide important habitat during base flow conditions cannot be maintained without suitable high flow pulses. High flow pulses also provide longitudinal connectivity along the river corridor for many species (TCEQ et al. 2008). At these locations staff would be unable to recommend removal of the recommendation. To evaluate the request to remove the wet season high flow pulse requirement at Richmond, staff used studies by Bonner and Runyan (2007) and Winemiller et al. (2004), discussed in more detail above. These studies indicate that maintaining high flow pulses and hydrologic connectivity to the flood plain are vital to the Brazos River ecosystem. Based on these studies and information submitted by the applicant, removal of the high flow pulse requirement during dry and average conditions at the Richmond gage would impact instream uses. However, in staff's opinion, the applicant's proposed diversion rates at the Brazos River near Richmond gage during the wet hydrologic condition would pose less of an environmental impact.

WATER QUALITY

The Brazos River comprises many surface water quality segments with designated uses of aquatic life, contact recreation, fish consumption, and public drinking water supply. The segments are not specifically named in this memo, but can be found in the *Atlas of Texas Surface Waters* (TCEQ 2004). Similarly, the designated uses of each of the surface water quality segments can be found in

2000 Texas Surface Water Quality Standards (TCEQ 2000).
Water quality in the Brazos River basin is regularly monitored through the Clean Rivers Program, for which the Brazos River Authority serves as the main point of contact. In-depth water quality investigations have been or are being carried out to resolve particular water quality problems in the basin. However, none of the extant water quality problems should be exacerbated by this requested water right.

For determining minimum flows that would sustain water quality, the seven day, two-year low flow (7Q2) is used. The 7Q2 is often considered the lowest allowable flow which provides adequate assimilation of pollutants, and it is the low flow value used in water quality modeling for Texas Pollutant Discharge Elimination System (TPDES) permitting. The 7Q2 is statistically derived from historical daily gaged flow data. The most recent 7Q2 values calculated by the Water Quality Assessment Team of the TCEQ for key gauges in the Brazos River basin are:

Gauge Name	Gauge #	7Q2 Value (cfs)	Period of Record
Brazos R nr Palo Pinto	08089000	30.29	1977-2005
Brazos R nr Glen Rose	08091000	15.29	1977-2005
Aquilla Creek above Aquilla	08093360	0.12	2001-2005
Brazos R nr Aquilla	08093100	30.71	1977-2005
Leon R at Gatesville	08100500	4.67	1977-2005
Leon R nr Belton	08102500	4.70	1977-2005
Lampasas R nr Belton	08104100	4.75	1969-2005
N Fork San Gabriel R nr Georgetown	08104700	1.53	1981-2005
Brazos R nr Highbank	08098290	167.14	1977-2005
Navasota R nr Easterly	08110500	7.56	1980-2005
Little R at Cameron	08106500	67.86	1977-2005
San Gabriel R at Laneport	08105700	3.60	1981-2005
Yegua Creek nr Somerville	08110000	0.06	1969-1991
Brazos R at Richmond	08114000	742.57	1977-2005

BAYS AND ESTUARIES

Diversions could affect the receiving waters at the Gulf of Mexico. However, the Brazos River discharges directly into the Gulf of Mexico rather than a receiving bay and estuary system, reducing the likelihood of adverse effects. The study of the Brazos River Estuary to determine freshwater inflow needs being executed by the Texas Water Development Board is still in progress.

COASTAL MANAGEMENT PROGRAM (CMP) CONSISTENCY

Applications for water appropriations of 5,000 acre-feet/year or more within the costal boundary zone require a determination that the proposed action is consistent with the State's Coastal Zone

Management Program. Resource Protection staff have determined the proposed application is subject to the Texas CMP, in accordance to Coastal Coordination Act Implementation Rules 31 TAC §505.11(a)(6)(H). The proposed project is located within the coastal management zone and is subject to the goals and policies of the CMP in accordance with the regulations of the Coastal Coordination Council (CCC).

The checklist of applicable coastal policies provides for the actual determination of consistency of the proposed application. The coastal policies specifically addressed in this environmental analysis are: 31 TAC §501.14 (r)(1)(C), (D), (E), (G), & (H). Based on a review of these policies, the proposed application should not have significant adverse impacts upon coastal natural resource areas.

SUMMARY AND RECOMMENDATIONS

1. Permittee shall conduct Instream Flow Studies (Studies) on the Brazos River and on segments of major tributaries upstream of their confluence with the Brazos River consistent with and in cooperation with the Texas Instream Flow Program. Upon completion of the Studies, Permittee shall submit an application to amend the WMP to reflect the results of the Instream Flow Studies.

2. Seasons are defined as Spring (March–May), Summer (June-August), Fall (September-November), and Winter (December-February). The number of seasons and the months representing each season are subject to revision in the WMP.

3. Total storage in Permittee's system reservoirs is a trigger for determining instream flow requirements and is subject to revision in future Water Management Plans. 7Q2 flows are to be implemented when total storage in Permittee's system reservoirs is below 60% of total capacity. "Dry" means times when the total storage in Permittee's system reservoirs is below 74%, but more than 60% of total capacity. "Average" means times when the total storage in Permittee's system reservoirs is at least 74%, but less than 96% of total capacity. "Wet" means times when the total storage in Permittee's system reservoirs is at least 96% of total capacity.

4. Storage triggers are to be recalculated every five years to ensure that Susbsistence, Dry, Average, and Wet conditions occur approximately 2.5%, 25%, 50%, and 75% of the time, respectively.

5. Until such time as the Studies are completed, the interim instream flows in the following tables apply at the following USGS gauging stations. Measurement points for instream flows are subject to change in the WMP, with the approval of the Executive Director. The instream flow criteria in the following tables are applicable at all times. Depending upon the hydrologic condition (Subsistence, Dry, Average, or Wet), storage of water authorized by this permit in Permittee's system reservoirs upstream from the following flow gauging stations and the diversion and use of water pursuant to this permit at locations upstream from the flow gauging

locations shall be authorized when streamflows exceed the instantaneous flow values established in the following tables:

Instream Flow (cfs)	BRAZOS RIVER NEAR GLEN ROSE - USGS #08091000			
	Winter	Spring	Summer	Fall
Subsistence (7Q2)	15.3	15.3	15.3	15.3
Dry	39.0	45.0	33.3	62.0
Average	92.0	138.0	101.5	150.0
Wet	234.0	292.8	249.5	332.0

Instream Flow (cfs)	YEGUA CREEK NEAR SOMERVILLE – USGS #08110000			
	Winter	Spring	Summer	Fall
Subsistence (7Q2)	0.1	0.1	0.1	0.1
Dry	5.6	3.9	0.4	0.3
Average	14.0	12.0	2.5	1.8
Wet	34.0	31.0	8.9	9.6

Instream Flow (cfs)	NAVASOTA RIVER NR EASTERLY – USGS #08110500			
	Winter	Spring	Summer	Fall
Subsistence (7Q2)	7.6	7.6	7.6	7.6
Dry	7.6	10.0	7.6	7.6
Average	15.0	24.0	7.6	7.6
Wet	36.0	43.0	7.6	7.6

Instream Flow (cfs)	LITTLE RIVER NEAR CAMERON – USGS #08106500			
	Winter	Spring	Summer	Fall
Subsistence (7Q2)	67.9	67.9	67.9	67.9
Dry	100.0	135.0	133.0	82.0
Average	200.0	365.0	260.5	152.0
Wet	475.0	730.0	500.0	342.0

Instream Flow (cfs)	BRAZOS RIVER NEAR HIGHBANK – USGS #08098290			
	Winter	Spring	Summer	Fall
Subsistence (7Q2)	167.1	167.1	167.1	167.1
Dry	167.1	167.1	167.1	167.1
Average	220.59	344.19	323.85	225.29
Wet	672.74	759.30	780.69	508.98

Instream Flow (cfs)	BRAZOS RIVER NEAR RICHMOND – USGS #08114000			
	Winter	Spring	Summer	Fall
Subsistence (7Q2)	743	743	743	743
Dry	885	1170	930	760
Average	1630	2030	1450	1150
Wet	2955	3670	2635	2038

6. A High Flow Pulse (HFP) is initiated when flows are greater than the 10th percentile and increase by more than 50% from the previous day, or when flows exceed the 75th percentile, regardless of the rate of change. A HFP is terminated when the flow drops below the 10th percentile or when the flow decreases from one day to the next by less than 5%, or when a succeeding pulse occurs. An entire HPF is reclassified as a small flood if the maximum rate exceeds the small flood threshold at the 1.5-yr recurrence interval.

7. Permittee shall meet a seasonal schedule of individual high flow pulses. Qualifying HFPs are defined as follows:

Pulse Flows (ac-ft)	BRAZOS RIVER NEAR GLEN ROSE - USGS #08091000			
Hydrologic Condition	Winter	Spring	Summer	Fall
Dry	2329.6	3208.3	2617.2	2211.6
Average	7325.0	14915.7	7265.5	7565.0
Wet	31220.8	36144.8	33064.5	28682.0

Peak Flows (cfs)	BRAZOS RIVER NEAR GLEN ROSE - USGS #08091000			
Hydrologic Condition	Winter	Spring	Summer	Fall
Dry	403	466	394	347
Average	1,120	2,070	1,320	1,040
Wet	4,945	5,265	4,370	3,525

Pulse Flow Schedule (days/# of events)	BRAZOS RIVER NEAR GLEN ROSE - USGS #08091000							
	Winter		Spring		Summer		Fall	
Hydrologic Condition	Dura*	Freq**	Dura	Freq	Dura	Freq	Dura	Freq
Dry	6	2	4	3	4	2	4	2

Average	7	2	6	2	6	2	7	1
Wet	13	1	10	2	11	1	11	1

*Duration **Frequency

Pulse Flows (ac-ft)	YEGUA CREEK NEAR SOMERVILLE – USGS #08110000			
Hydrologic Condition	Winter	Spring	Summer	Fall
Dry	416.6	275.7	52.4	59.2
Average	1904.1	1225.8	239.2	372.9
Wet	8510.1	4331.3	845.2	3367.3

Peak Flows (cfs)	YEGUA CREEK NEAR SOMERVILLE – USGS #08110000			
Hydrologic Condition	Winter	Spring	Summer	Fall
Dry	69	51	13	10
Average	294	176	53	64
Wet	978	620	140	490

Pulse Flow Schedule (days/# of events)	YEGUA CREEK NEAR SOMERVILLE – USGS #08110000							
	Winter		Spring		Summer		Fall	
Hydrologic Condition	Dura*	Freq**	Dura	Freq	Dura	Freq	Dura	Freq
Dry	5	2	5	2	4	2	5	1
Average	10	1	8	1	7	1	7	2
Wet	15	1	13	1	11	1	11	1

*Duration **Frequency

Pulse Flows (ac-ft)	NAVASOTA RIVER NR EASTERLY – USGS #08110500			
Hydrologic Condition	Winter	Spring	Summer	Fall
Dry	439.3	748.3	195.9	77.1
Average	2142.1	2220.5	746.9	275.0
Wet	7927.9	8537.9	3399.7	2456.3

Peak Flows (cfs)	NAVASOTA RIVER NR EASTERLY – USGS #08110500			
Hydrologic Condition	Winter	Spring	Summer	Fall
Dry	76	124	33	11
Average	298	344	142	43
Wet	1,060	1,160	592	371

Pulse Flow Schedule (days/# of events)	NAVASOTA RIVER NR EASTERLY – USGS #08110500							
	Winter		Spring		Summer		Fall	
Hydrologic Condition	Dura*	Freq**	Dura	Freq	Dura	Freq	Dura	Freq
Dry	5	2	5	3	5	2	4	2
Average	8	2	9	2	8	2	7	2
Wet	12	1	12	1	13	1	11	1

*Duration **Frequency

Pulse Flows (ac-ft)	LITTLE RIVER NEAR CAMERON – USGS #08106500			
Hydrologic Condition	Winter	Spring	Summer	Fall
Dry	4194.4	5641.5	3563.3	3511.2
Average	9633.7	16251.6	9088.3	9183.5
Wet	29414.9	42034.7	25811.4	20494.2

Peak Flows (cfs)	LITTLE RIVER NEAR CAMERON – USGS #08106500			
Hydrologic Condition	Winter	Spring	Summer	Fall
Dry	604	958	577	568
Average	1,600	2,545	1,875	1,630
Wet	5,190	6,405	3,665	3,723

Pulse Flow Schedule (days/# of events)	LITTLE RIVER NEAR CAMERON – USGS #08106500							
	Winter		Spring		Summer		Fall	
Hydrologic Condition	Dura*	Freq**	Dura	Freq	Dura	Freq	Dura	Freq
Dry	5	1	4	2	4	2	4	2
Average	6	1	6	2	6	1	6	1
Wet	10	1	9	1	9	1	9	1

*Duration **Frequency

Pulse Flows (ac-ft)	BRAZOS RIVER AT HIGHBANK – USGS #08098290			
Hydrologic Condition	Winter	Spring	Summer	Fall
Dry	5113.9	6040.7	4784.0	3652.4
Average	11647.1	14346.9	15135.1	11398.8
Wet	38514.1	38127.3	49810.6	39416.6

Peak Flows (cfs)	BRAZOS RIVER AT HIGHBANK – USGS #08098290			
Hydrologic Condition	Winter	Spring	Summer	Fall
Dry	1471	1429	1116	714
Average	2576	2952	2566	2274
Wet	5225	6748	7703	5366

Pulse Flow Schedule (days/# of events)	BRAZOS RIVER AT HIGHBANK – USGS #08098290							
	Winter		Spring		Summer		Fall	
Hydrologic Condition	Dura*	Freq**	Dura	Freq	Dura	Freq	Dura	Freq
Dry	3	1	3	3	3	3	3	2
Average	4	1	4	3	5	2	5	2
Wet	7	1	7	1	8	1	9	1

*Duration **Frequency

Pulse Flows (ac-ft)	BRAZOS RIVER NEAR RICHMOND – USGS #08114000			
Hydrologic Condition	Winter	Spring	Summer	Fall
Dry	36265.8	44667.8	38181.1	22457.9
Average	90287.6	101405.0	77176.9	56162.0
Wet	297550.4	270153.7	166115.7	146866.1

Peak Flows (cfs)	BRAZOS RIVER NEAR RICHMOND – USGS #08114000			
Hydrologic Condition	Winter	Spring	Summer	Fall
Dry	3,748	5,640	4,880	2,500
Average	9,670	10,200	8,830	7,730
Wet	19,500	19,150	15,300	13,175

Pulse Flow Schedule (days/# of events)	BRAZOS RIVER NEAR RICHMOND – USGS #08114000							
	Winter		Spring		Summer		Fall	
Hydrologic Condition	Dura*	Freq**	Dura	Freq	Dura	Freq	Dura	Freq
Dry	5	1	5	1	4	1	4	1
Average	6	1	7	1	7	1	7	1
Wet	16	1	13	1	12	1	11	1

*Duration **Frequency

8. Except under Subsistence conditions, diversion or storage of water upstream from defined measurement points, under the authority of this permit, shall be authorized during a pulse when the volume, duration, and peak flow of the individual pulse exceeds the individual pulse criteria, or when the number of pulse events in that season exceeds the pulse frequency criteria. When a Qualifying HFP is passed or provided for at one of the six defined measurement points it may be used as credit for meeting one seasonal HFP frequency requirement.

9. For streamflow events that meet the requirements of Special Condition #5, Permittee may temporarily impound all flows in excess of the instream flow requirement. If the streamflow event provided a Qualifying HFP, flow may need to be passed downstream for environmental needs, subject to seasonal requirements in Special Condition #7 above. If it did not, then Permittee may retain the impounded water for water supply purposes. Once the required number of HFPs is met, Permittee may impound all subsequent HFPs for use as water supply as long as instream flow requirements specified in Special Condition #5 are met.

10. For pulses that generate a volume in excess of 250% of the Qualifying HFP volume criterion, Permittee must provide two Qualifying HFPs with at least one week of instream flow, as required by Special Condition #5 above, between them. Similarly, for pulses in excess of 350% of the Qualifiying HFP volume criterion, Permittee must provide three Qualifying HFPs with at least one week of instream flow between each pair. A similarly scaled requirement holds for larger pulses.

11. For streamflow events that meet the requirements of Special Condition #5, but do not meet the minimum requirements of a Qualifying HFP, Permittee may impound flows in excess of instream flow requirements and shall record the impounded volume in their accounting/delivery plan. At such time as the cumulative volume of streamflow events exceeds the volume of a Qualifying HFP, Permittee may release such a pulse to the environment. Such a release will result in a credit for a Qualifying HFP.

12. If the streamflow event is designated a HFP but ultimately does not meet the minimum requirements of a Qualifying HFP, the volume passed shall be recorded in the accounting/delivery plan. At such time as the cumulative volume of such pulses exceeds the volume of a Qualifying HFP, Permittee will be credited with one Qualifying HFP (even if the duration, peak flow, etc. characteristics were not met).

13. For purposes of determining satisfaction of Qualifying HFP criteria, each season is accounted for independently. There is no carry-over from season to season, either in regard to exceeding or not meeting HFP requirements. In the event there are seasons where the requisite number or volume of HFPs do not occur naturally, the Permittee is not obligated to meet the seasonal HFP requirements. In the event that a pulse extends across seasonal boundaries, it will be accounted for in the season in which it ends.

14. All seasonal HFP requirements are to be met using streamflow events with peak flows less than the 1.5-year return interval. Streamflow events with peak flows that exceed the 1.5-year return interval are classified as overbanking flows and the water volume associated with these events shall not be used to meet HFP requirements.'

15. Permittee may divert water at or downstream of USGS Gage No. 08114000, Brazos River near Richmond without restriction during wet season pulses as defined in Special Condition 7 when permittee's diversion rate is less than 7,535 cfs, if permittee also meets the applicable instream flow requirement is Special Condition 5.

16. In addition to the measurement points and requirements specified in Special Conditions 5 and 7 above, Permittee is prohibited from diverting and storing water authorized by this permit unless streamflow at the following gauges meets or exceeds the 7Q2 value as follows:

Gauge Name	Gauge #	7Q2 Value (cfs)
Brazos R nr Palo Pinto	08089000	30.3
Aquilla Creek above Aquilla	08093360	0.1
Brazos R nr Aquilla	08093100	30.7
Leon R at Gatesville	08100500	4.7
Leon R nr Belton	08102500	4.7
Lampasas R nr Belton	08104100	4.8
N Fork San Gabriel R nr Georgetown	08104700	1.5
San Gabriel R at Laneport	08105700	3.6

17. Permittee shall install and maintain a streamflow gage at Yegua Creek at Somerville.

18. The requirements of the Special Conditions apply only to diversion and storage under the authority of this permit and do not address or limit diversion and storage of water authorized by other water rights held by Permittee.

19. These special conditions are subject to adjustment by the Commission if the Commission determines, through an expedited public review process, that such adjustment is appropriate to achieve compliance with applicable environmental flow standards adopted pursuant to Texas Water Code § 11.1471. Any adjustment shall be made in accordance with the provisions of Texas Water Code § 11.147(e-1).

This instream use assessment was conducted using current TCEQ operation procedures and policies and available data and information. The recommendations in this environmental analysis are intended for the protection of instream uses and do not necessarily provide protection to downstream water rights; that analysis is addressed in the hydrology memo and further restrictions may be applicable as necessary. Authorizations granted to the permittee by the water rights permit shall comply with all rules of the Texas Commission on Environmental Quality, and other applicable State and Federal authorizations.

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Texas Commission on Environmental Quality

INTEROFFICE MEMORANDUM

To: Ronald Ellis, Application Manager
Water Rights Team
Water Rights Permitting & Availability Section

February 9, 2010

Through: Chris Loft, Team Leader
Resource Protection Team
Water Rights Permitting & Availability Section

Gregg Easley, Aquatic Scientist
Resource Protection Team
Water Rights Permitting & Availability Section

From: Dakus Geeslin, Aquatic Scientist
Resource Protection Team
Water Rights Permitting & Availability Section

Subject: Brazos River Authority
WRPERM 5851
CN600506794
RN104319736
Brazos River Basin

ENVIRONMENTAL ANALYSIS ADDENDUM

INSTREAM USES

The initial environmental memorandum was completed November 25, 2008 and a draft permit was sent to the applicants on December 1, 2008. BRA submitted additional information on August 6, 2009 and August 13, 2009. The information was reviewed by Resource Protection Staff and staff recommend that the draft permit be modified as follows:

Add an additional special condition requiring that the following be included in the initial application for the WMP:

1. consideration of establishing diversion rate trigger levels for high flow pulse (HFP) requirements; included in Special Condition 6.E.7, below which the requirements of Special Condition 6.E.7 would not apply;

2. establishment of a Brazos River Basin environmental flow study program identifying environmental flow studies to be conducted on specified reaches and the estimated time for completion of the studies. The program shall include studies anticipated to be

required for the FERC relicensing of the hydropower facility at Morris Sheppard Dam and such studies necessary to comply with Special Conditions 6.E.1 and 6.E.17. Permittee shall use the program studies to evaluate the need for instream flow protection for the mainstem Brazos River and tributaries impacted by the diversion and storage of water authorized by this permit;

3. development of operating guidelines to manage the frequency and magnitude of reservoir level fluctuations to avoid or minimize impacts on fisheries. The operating guidelines may be subject to temporary suspension if necessary for water supply purposes;

4. development and implementation of a specific adaptive management strategy for meeting instream flow requirements consistent with providing water supplies. The adaptive management strategy shall include a monitoring program for assessing impacts on instream uses and address short and long term impacts to economically and ecologically important stream fisheries, unique aquatic communities and species, and water quality;

BRA also proposed revisions to the draft permit related to the Interim Special Conditions Relative to Environmental Flows. Resource Protection staff reviewed the proposed changes and recommend modifications to specific provisions as follows:

In lieu of 6.E.1

The following interim conditions are preliminary and are based upon historic flow analyses, without direct relationships to the biological and environmental benefits intended to be protected; therefore, Permittee shall conduct Instream Flow Studies (Studies) on the Brazos River and on segments of major tributaries upstream of their confluence with the Brazos River consistent with and in cooperation with the Texas Instream Flow Program (TIFP). Upon completion of the Studies, Permittee shall use the results to develop environmental flow conditions to replace the interim conditions in this permit for the measurement points identified in 6.E.5. Depending upon the time of completion of the Studies, replacement of these interim conditions shall be approved in the initial WMP or through the amendment of an approved WMP. The Studies are not limited to the geographic scope of the studies currently defined for the TIFP.

In lieu of 6.E.4

Permittee shall recalculate the storage triggers specified in 6.E.3 every five years to ensure that Subsistence, Dry, Average, and Wet conditions occur at the desired frequencies. The desired frequencies are Subsistence equal to 2.5% of the time, Dry equal to 22.5% of the time, Average equal to 50% of the time and Wet equal to 25% of the time.

Modify the following table in 6.E.5 to correct an error in the original draft permit:

Instream Flow (cfs)	NAVASOTA RIVER NEAR EASTERLY USGS #08110500			
	Winter	Spring	Summer	Fall
Subsistence (7Q2)	7.6	7.6	7.6	7.6
Dry	7.6	10.0	7.6	7.6
Average	15.0	24.0	7.6	7.6
Wet	36.0	43.0	7.6	7.6

In lieu of 6.E.6

A High Flow Pulse (HFP) is initiated when flows are greater than the 10th percentile and increase by more than 50% from the previous day, or when flows exceed the 75th percentile, regardless of the rate of change. A HFP is terminated when the flow drops below the 10th percentile or when the flow decreases from one day to the next by less than 5%, or when a succeeding pulse occurs. An entire HFP is also classified as a small flood if the maximum rate exceeds the small flood threshold at the 1.5 year recurrence interval.

Modify the following table in 6.E.7 to correct an error in the original draft permit:

Pulse Flow Schedule (days/# of events)	BRAZOS RIVER NEAR RICHMOND – USGS #08114000							
	Winter		Spring		Summer		Fall	
Hydrologic Condition	Dura*	Freq**	Dura	Freq	Dura	Freq	Dura	Freq
Dry	5	1	5	1	4	1	4	1
Average	8	1	7	1	7	1	7	1
Wet	16	1	13	1	12	1	11	1

In lieu of 6.E.14

Seasonal HFP requirements are to be met using streamflow events with peak flows less than the 1.5-year return interval; however, streamflow events with both peak flows that exceed the 1.5-year return interval and satisfy the requirements of a Qualifying HFP may be classified as both overbanking flows and an HFP.

Based on information submitted by BRA, staff recommends that 6.E.15 be deleted from the draft permit. Future diversions at or downstream of USGS Gage No. 08114000, Brazos River near Richmond, and conditions associated with those diversions will be specified in the Water Management Plan.

Add new special conditions:

Special Conditions 6.E.6-6.E14, relating to High Flow Pulses are subject to Special Condition 6.D.4, relating to the contents of the initial application for approval of the WMP.

In lieu of 6.E.16, staff recommends using the most recently calculated 7Q2 values and adding an additional measurement point at USGS Gage 08100500, Leon River near Gatesville.

Gage Name	Gage #	7Q2 Value (cfs)
Brazos River near Palo Pinto	08089000	32.0
Aquilla Creek above Aquilla	08093360	0.1
Brazos River near Aquilla	08093100	26.0
Leon River near Belton	08102500	4.7
Leon River near Gatesville	08100500	4.7
Lampasas River near Belton	08104100	4.8
N Fork San Gabriel River near Georgetown	08104700	1.1
San Gabriel River at Laneport	08105700	3.6

Staff recommends an additional special condition related to Monitoring studies:

Permittee, in cooperation with TPWD and the Commission, shall conduct Monitoring Studies to assess instream flow protection at the water quality protection measurement points identified in 6.E.16. These Monitoring Studies shall collect baseline data on the biology, habitat, water quality, hydrology, ecosystem health and other environmental factors of the stream segment between the water quality protection point and the immediate downstream measurement point. If baseline data is sufficient to determine instream flow protection needs, and such criteria are determined to be necessary, the data shall be used to develop criteria to replace the values in 6.E.16. If the results of the Monitoring Studies indicate that additional study is needed, Instream Flow Studies shall be conducted to determine appropriate instream flow protection criteria for the water quality protection points and the results of such Instream Flow Studies shall be used to develop criteria to replace the values in 6.E.16. Depending upon the time of completion of the Monitoring Studies or applicable Instream Flow Studies, modification of the values in 6.E.16 shall be approved in the initial WMP or through the amendment of an approved WMP. As part of the study and analysis required in this provision, Permittee shall perform and complete a Little River watershed study (including all points identified above in 6.E.16 within the Little River watershed) prior to filing its application for approval of the initial WMP. If Permittee does not complete the Little River watershed study prior to filing its application for approval of the initial WMP, Permittee shall not divert or impound water authorized by this permit from the Little River watershed until that study is completed and results considered in an application to amend the WMP.

Staff recommends adding a special condition addressing overbanking flows:

Permittee shall consult with the U.S. Army Corps of Engineers on federal projects to determine whether overbanking flows can be safely managed to maintain a sound ecological environment.

In the original draft permit, 6.E.17 required the permittee to install and maintain a streamflow gage at Yegua Creek at Somerville. The U.S. Army Corps of Engineers currently sponsors this gage on Yegua Creek, therefore staff recommends removing this special condition from the draft permit.

All other recommendations in the original memo dated November 25, 2008 remain unchanged unless specifically addressed in this addendum.

Texas Commission on Environmental Quality

INTEROFFICE MEMORANDUM

To: Ronald L. Ellis, Application Manager
Water Rights Permitting Team
Water Supply Division

Date: December 1, 2008

Thru: Christopher Loft, Team Leader CL 12/1/08
Resource Protection Team
Water Supply Division

From: Kristin Wang, Senior Water Conservation Specialist
Resource Protection Team
Water Supply Division

KW 12/1/08

Subject: Brazos River Authority
WRPERM5851
CN600506794
Water Conservation Plan Technical Review
Projected Water Demands and Supplies, Brazos River Authority's Projected Service Area

The attached review was conducted pursuant to the pending application to Water Right Permit No. 5851. Brazos River Authority (BRA) seeks a Water Use Permit to authorize: 1) appropriation and use of 421,449 acre-feet of water per annum from the Brazos River Basin for multi-use purposes within the Brazos River Basin, San Jacinto-Brazos Coastal, and Brazos-Colorado Coastal Basins (Exempt IBT); 2) to include, as a part of the above appropriation, an appropriation of the current and future return flows; 3) operational flexibility to (i) use any source of water available to the applicant to satisfy diversion requirements by passing water through BRA's reservoirs on a priority basis and (ii) release, pump, and transport water from any of the reservoirs for use thru-out BRA's service area; 4) recognition that the System Operation Permit will prevail over inconsistent provisions in BRA's existing Water Rights and 5) to use the bed and banks of the Brazos River and its tributaries and BRA's reservoirs for storage, conveyance and diversion and use of the water authorized.

The attached review includes the evaluation of the following: (1) Water Conservation Plan for BRA, and (2) Projected Water Demands and Supplies in BRA's service area.

The water conservation plan for BRA was reviewed to determine the plan's compliance with Title 30 of the Texas Administrative Code, Chapter 288.5, which contains the minimum requirements for water conservation plans for wholesale water suppliers. The technical review fulfills Texas Water Code Chapter 11.134 (b)(4). The BRA's plan meets the Chapter 288 minimum requirements for wholesale water suppliers that were in effect at the time the application was received.

In the Region G Water Plan, BRA details projected water supplies from the proposed BRA

System Operation appropriation to satisfy the total projected water demands in the Region G, Region H, Region C, and Region O. The projected water demands are based on the number of total contracts or projected demands, plus demands to be met from water management strategies recommended for BRA.

The conservation staff of the Resource Protection Team recommends that the request from the Brazos River Authority be granted.

This recommendation is based on the BRA System Operation being listed as the systems approach strategy in the Region G Water Plan summary of recommended water management strategies involving new sources of supply by the Brazos G Regional Water Planning Group (BGRWPG). Therefore, this request is not inconsistent with the approved 2006 Region G Water Plan and 2007 State Water Plan.

The following standard water conservation language should be included in the permit:
"Owners shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, or prevent the pollution of water, so that a water supply is made available for future or alternative uses. Such plans shall include a requirement that in every wholesale water contract entered into, on or after the effective date of this amendment, including any contract extension or renewal, that each successive wholesale customer develop and implement conservation measures. If the customer intends to resell the water, then the contract for resale of the water must have water conservation requirements so that each successive wholesale customer in the resale of the water be required to implement water conservation measures."

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Technical Review
of
Brazos River Authority
WRPERM5851
CN600506794
Water Conservation Plan

Brazos River Authority (BRA) seeks a Water Use Permit to authorize: 1) appropriation and use of 421,449 acre-feet of water per annum from the Brazos River Basin for multi-use purposes within the Brazos River Basin, San Jacinto-Brazos Coastal, and Brazos-Colorado Coastal Basins (Exempt IBT); 2) to include, as a part of the above appropriation, an appropriation of the current and future return flows; 3) operational flexibility to (i) use any source of water available to the applicant to satisfy diversion requirements by passing water through BRA's reservoirs on a priority basis and (ii) release, pump, and transport water from any of the reservoirs for use thru-out BRA's service area; 4) recognition that the System Operation Permit will prevail over inconsistent provisions in BRA's existing Water Rights and 5) to use the bed and banks of the Brazos River and its tributaries and BRA's reservoirs for storage, conveyance and diversion and use of the water authorized.

The applicant is required to provide evidence that the amount of water appropriated will be beneficially used, i.e., effectively managed and not wasted pursuant to TWC §11.134(b)(3)(A). Also, the applicant must provide evidence that reasonable diligence will be used to avoid waste and achieve water conservation, pursuant to TWC §11.134(b)(4). To provide that evidence, the applicant has submitted a water conservation and drought contingency plan in accordance with Chapter 288 of Title 30 TAC.

BRA prepared a 2004 water conservation plan and 1999 drought contingency plan as the required submittal with its Water Right Application No. 5851. BRA's water right application was received on June 28, 2004. In 2005, BRA also submitted an updated water conservation plan and drought contingency plan. BRA's water conservation plan and drought contingency plan were reviewed in accordance with Title 30, Texas Administrative Code, Chapter 288.

The purpose of this technical review is to:

(1) determine whether the water conservation plan addresses all the minimum requirements of a water conservation plan as established by the Texas Commission On Environmental Quality (TCEQ) in Title 30 TAC Chapter 288;
(2) determine whether reasonable conservation goals have been set;
(3) determine whether strategies proposed can achieve the stated goals;
(4) determine whether there is a substantiated need for the water and whether the

amount to be appropriated is reasonable for the proposed use; and

(5) determine whether the drought contingency plan addresses all the minimum

(6) requirements of a drought contingency plan as established by the TCEQ in Title 30 TAC Chapter 288.

If these criteria are met, then sufficient evidence has been presented to conclude that BRA will avoid waste and achieve water conservation. This technical review forms a basis for permit conditions and limitations as provided by §11.134 of the Texas Water Code.

SECTION I
WATER USE PROFILE

The following is an overview of the BRA service area, water supply, and water use characteristics. The sources of information are BRA's 2004 water conservation plan and an updated BRA 2005 water conservation plan.

Service Area

BRA's service area includes the Brazos River Basin in Texas, and BRA also supplies water outside of the Brazos River Basin to the San Jacinto-Brazos Coastal Basin and a small part of the Trinity River Basin (in Johnson County).

BRA makes water available on a wholesale basis from the existing twelve reservoirs in which it holds water rights to municipal, industrial and agricultural water customers. BRA owns and operates the Lake Granbury Surface Water and Treatment System (SWATS), The SWATS plant provides water for the City of Granbury, the Action Municipal Utility District, the Johnson County Fresh Water Supply District No.1, the Johnson County Rural Special Utility District, and the City of Keene.

Planning Area

BRA lists major municipal customers which include Acton MUD, Aquilla WSC, Bell County WCID#1, Central Texas WSC, City of Cleburne, City of Georgetown, City of Granbury, Gulf Coast Water Authority, Johnson County Rural WSC, City of Lubbock, City of Round Rock, City of Taylor, and City of Temple. BRA also compiles the projected population, municipal water use, and per capita municipal water uses for BRA's major municipal customers as mentioned above in both water conservation plans.

BRA also addresses the population data and population projections for the Brazos River Basin, the San Jacinto-Brazos, and the Brazos-Colorado Coastal Basins. In 2000, the projected populations of the Brazos River Basin, San Jacinto-Brazos Coastal Basin, and Brazos-Colorado Coastal Basin were approximately 2.14 million, 838,000, and 81,000, respectively. The projected populations for the Brazos River Basin, San Jacinto-Brazos Coastal Basin, and Brazos-Colorado Coastal Basin will be approximately 3.91 million, 1.55 million, and 1 million respectively in the year of 2050.

Water Supply

BRA holds Texas water rights for three reservoirs that the Authority owns and operates for water supply- Possum Kingdom Lake, Lake Granbury, and Lake Limestone. BRA holds Texas water rights and contracts with the U.S. Army Corps of Engineers for storage space in eight multi-purpose Federal reservoirs - Lakes Whitney, Belton, Proctor, Somerville, Stillhouse Hollow, Granger, Georgetown, and Aquilla. BRA also holds a water right jointly with the City of Houston and the Texas Water Development Board for the proposed Allens Creek Reservoir.

Based on the updates from the TCEQ water rights database, the current surface water rights permits and the appropriation amounts related to the BRA are compiled in Table 1.

Table 1
Current Surface Water Rights Permits to Brazos River Authority

Water Right No.	Appropriation (acre-feet per year)	Reservoir/Facility
Application No. 3194	sharing of 99,650 w/ City of Houston and Texas Water Development Board	Allens Creek Reservoir/ Project
12-5155	230,750	Possum Kingdom Lake
12-5156	64,712	Lake Granbury
12-5157	18,336	Lake Whitney
12-5158	13,896	Lake Aquilla
12-5159	19,658	Lake Proctor
12-5160	100,257	Lake Belton
12-5161	67,768	Lake Stillhouse Hollow
12-5162	13,610	Lake Georgetown
12-5163	19,840	Lake Granger
12-5164	48,000	Lake Somerville
12-5165	65,074	Lake Limestone
12-5166	No additional appropriation	Excess Flows Use
12-5167	No additional appropriation	Excess Flow Use

**Source: TCEQ Water Rights Permitting & Availability Section's Database*

In addition to the reservoirs, BRA operates two pipeline delivery systems: the Williamson County Raw Water Line connecting Lake Stillhouse Hollow to Lake Georgetown, and the West Central Brazos Water Distribution System, a pipeline formerly used to deliver water from Lake

Possum Kingdom for oilfield production. The Williamson County pipeline is expected to begin operation in 2004 and the West Central Brazos system is expected to begin delivery of water to municipal customers by 2006.

Water Use

As of April 1, 2004, BRA has approximately 623,000 acre-feet per year of water committed under long-term contracts. Table 2 lists customers with contracts for 5,000 acre-feet per year or more.

Table 2
Brazos River Authority Contracts for 5,000 Acre-Feet per Year or More

Entity	Contract Amount (Acre-Feet per Year)
TXU	122,447
Reliant	97,000
Bell County WCID #1	49,509
City of Lubbock	35,000
Gulf Coast Water Authority	32,668
City of Temple	27,953
City of Round Rock	24,854
City of Georgetown	22,168
Dow Chemical	16,000
Johnson County Rural SUD	13,210
City of Granbury	11,300
AES Wolf Hollow, L.P.	10,000
City of Taylor	8,525
Acton MUD	7,800
Central Texas WSC	6,950
Texas A&M University	6,945
Kerr-McGee Oil & Gas	6,000
Aquilla Water Supply District	5,953

South Texas Water Company	5,625
City of Cleburne	5,300
Alcoa	5,000

**source: 2004 BRA submittal*

Based on the 2006 Regional G Water Plan, the BRA had 600,640 acre-feet of water contracts in 2000 and had 231,613 acre-feet of water sales for that year from various water sources as listed in Table 3.

Table 3
Brazos River Authority 2000 Contracts and Sales
(in acre-feet)

2000 Contracts	2000 Sales	Water Source
600,640[1]	231,613[1]	Lake Aquilla, Belton, Georgetown, Granbury, Granger, Limestone, Possum Kingdom, Proctor, Somerville, Stillhouse Hollow, Whitney

[1] Includes contracts in other regions.

**source: 2006 Region G Water Plan (Section 1 , Table 1-7, page 1-21)*

SECTION II
WATER CONSERVATION PLAN TECHNICAL REVIEW

The technical review of a water conservation plan consists of three steps:

(1) Verify that all minimum requirements of §288 have been met;
(2) Determine whether reasonable conservation goals have been set; and
(3) Determine whether the strategies proposed can achieve the stated goals.

Step 1: Verify that all minimum requirements of TAC, Title 30, §288 have been met.

The BRA water conservation plan meets all of the minimum requirements for wholesale water conservation plans as set forth in 30 TAC Chapter 288.5.

Step 2: Determine whether reasonable conservation goals have been set.

Commission staff assess the reasonableness of the water conservation goals based on whether the applicant has addressed the following steps:

1. identification of a water problem;

2. performance of a system audit; and
3. selection of goals based on the technical potential identified in the audit.

If the three steps have been completed and summarized in the water conservation plan, then Commission staff conclude that there is a substantiated basis for the goals and that the conservation plan is integrated into water management. Therefore, the goals are deemed reasonable.

Step (a): Identification of a water problem

Water demand projections a BRA necessitate the development of additional water supplies. Based on the data reported in BRA's 2004 water conservation plan, the projected populations, and municipal water use from 2000 and subsequent decades for BRA's major customers are compiled in both Table 4 and Table 5.

BRA serves the 13 major municipal customers listed in Table 4 and many of those major customers provides water to other water systems. BRA provided 183,821 acre-feet of water to serve the population of 950,452 for those municipal customers in 2000.

Table 4
Projected Population, Municipal Water Use for Major Municipal Customers in 2000

Customer	Demand (acre-feet)	Population
Acton MUD	2,026	12,222
Aquilla WSC	2,044	9,837
Bell County WCID#1	27,543	172,150
Central Texas WSC	4,933	28,551
Cleburne	4,165	26,005
Georgetown	6,127	28,339
Granbury	2,005	5,718
Gulf Coast Water Authority	59,896	308,421
Johnson County Rural WSC	1,694	8,843
Lubbock	40,461	199,564
Round Rock	16,169	76,701

Taylor	2,281	13,575
Temple	14,477	60,526
Total	**183,821**	**950,452**

**source: 2004 BRA submittal*

Table 5
Projected Population, Municipal Water Use for Major Municipal Customers In 2010, 2030, and 2060.

Customer	Demand (acre-feet)			Population		
	2010	**2030**	**2060**	**2010**	**2030**	**2060**
Acton MUD	2,425	3,363	5,204	15,036	21,599	33,909
Aquilla WSC	2,066	2159	2,382	10,110	10,925	12,328
Bell County WCID#1	35,377	46,313	54,219	204,927	262,661	324,815
Central Texas WSC	5,731	6,455	6,879	31,310	35,591	38,356
Cleburne	5,748	7,003	9,879	29,158	36,774	52,812
Georgetown	8,610	15,141	27,895	40,888	73,463	136,082
Granbury	2,369	3,213	4,851	6,843	9,467	14,388
Gulf Coast Water Authority	67,358	74,633	86,649	360,292	424,263	514,400
Johnson County Rural WSC	2,237	3,693	7,008	11,675	18,523	32,928
Lubbock	41,765	42,652	41,915	210,658	222,680	224,074
Round Rock	23,221	40,647	72,437	113,258	202,866	360,596
Taylor	2,522	3,208	4,625	15,530	20,606	30,363
Temple	16,247	20,427	25,954	69,251	88,834	114,256
Total	**215,676**	**268,907**	**349,897**	**1,118,936**	**1,428,252**	**1,889,307**

**source: 2004 BRA submittal*

The projected population for the BRA major customers' service is projected to grow to 1,889,307 and the water demand is projected to be 349,897 acre-feet in 2060 based on Table 5. As of 2004, BRA has total authorized priority diversions of 796,551 acre-feet per year.

Step (b): Performance of a system audit

As of 2004, BRA has 13 major municipal customers. BRA provides assistance to its customers in the development and implementation of conservation programs.

Step (c): Selection of goals

In the 2004 submittal, BRA indicates that the following conservation goals.

1. Implement a program of regular inspection, maintenance and repair of pipelines and pump stations in BRA's delivery system. Emphasize control of leaks and water losses.

2. Continue to develop and improve BRA's existing water conservation education and information program.

3. Develop and implement appropriate water conservation plans and programs to meet the needs of specific projects, area or circumstances.

4. As new contracts are entered into and contracts are renewed, required contract users to develop and implement conservation plans pursuant to TCEQ rules. For users that supply potable water to others will be encouraged to establish a goal to reduce annual unaccounted water in distribution systems to no more than 12% within 5 years of the date of the water conservation plan and maintain unaccounted losses at no more than 12% for each year thereafter.

Step 3: Determine whether the strategies proposed can achieve the stated goals.

For a regional water supplier such as BRA, water conservation largely involves working with each customer to ensure efficient and wise use of the water. BRA stated as goals several strategies that involve customer assistance in development of water conservation plans. Working with municipal customers to achieve common goals can contribute to achieving BRA over conservation goals.

The strategies proposed appear to be reasonable for achieving a reduction in gallons-per-capita-daily (gpcd) water use within the BRA service area through working with customers on water conservation efforts. BRA lists the range of water use from 67 gpcd to 394 gpcd for water use groups under the 13 major municipal customers in 2000.

SECTION III
EVALUATION OF ESTIMATED WATER DEMAND

As previously stated, the application requests 1) an additional 421,449 acre-feet of water per year

for multi-use purposes to the applicant's service area within the Brazos River Basin, San Jacinto-Brazos Coastal, and Brazos-Colorado Coastal Basins 2) to use the bed and banks of the Brazos River and its tributaries and BRA's reservoirs for storage, conveyance and diversion and use of the water authorized.

In 2000, BRA provided water to 13 major municipal customers and the current and projected populations have been compiled in the 2004 BRA submittal summarized in Table 6.

Table 6 BRA's Current and Projected Population Information		
Current population of service area (in 2000)		950,452
Projected population of wholesale customers to be served by BRA		
2010	**2030**	**2060**
1,118,936	1,428,252	1,889,307

**source: 2004 BRA submittal*

The conservation staff used the 2006 Region G Water Plan as the guideline for this technical review.

BRA is the primary provider of water to the Brazos G Region. BRA provides water from three reservoirs in the region: Lake Granbury, Possum Kingdom Lake, and Lake Limestone. BRA also contracts for conservation storage space in the nine U.S. Army Corps of Engineers reservoirs in the region: Lakes Waco, Proctor, Belton, Stillhouse Hollow, Georgetown, Granger, Somerville, Whitney, and Aquilla. The total permitted capacity of these twelve reservoirs in the BRA system is approximately 2.3 million acre-feet.

BRA holds rights for diversion in the region totaling more than 662,000 acre-feet, and contracts to supply water to municipal, industrial and agricultural water customers in the Brazos G Region Water Planning Area and other regions.

For planning purposes, the overall BRA system has been divided into three separate systems: the Lake Aquilla system consisting of Lake Aquilla and its associated contracts; the Little River System consisting of Lake Proctor, Lake Belton, Stillhouse Hollow Reservoir, Lake Georgetown, and Lake Granger; and the Main Stem/Lower Basin System consisting of Possum Kingdom Reservoir, Lake Granbury, Lake Whitney, Lake Somerville, and Lake Limestone.

The demands shown in Table 7 include the projected demands for water from the proposed BRA System Operation appropriation. Projected demands are total contracts or projected demands of customer entities, (whichever is greater), plus demands to be met from water management strategies recommended for BRA.

Table 7 Brazos River Authority Projected Water Demands (in acre-feet) for 2010-2060			
Major Long-Term Water Contracts/Future Sales (as of June 2005)	**2010**	**2030**	**2060**
Lake Aquilla System[1]	11,403	11,403	11,403
Little River System[2]	212,323	212,323	243,389
Main Stem/Lower Basin System[2] (Brazos G)	470,058	478,959	523,520
Main Stem/Lower Basin System[3] (Brazos H)	301,258	326,481	375,406
Projected Total Demand	**995,042**	**1,029,166**	**1,153,718**

**source: 2006 Region G Water Plan (Section 4A, Table 4A-6, page 4A-13)*

[1] Demands for Lake Aquilla System in excess of current contracts are assumed to be met from Main Stem/Lower Basin System.

[2] Demands include 460,586 acre-feet per year of current contracts (combined three systems) in Brazos G, 2,761 acre-feet per year of current contracts in Region O and Region C, and future demands to be met by the BRA in Brazos G and Region C. Future demands will be met from uncontracts BRA supply, BRA System Operations, and Lake Granger Augmentation.

[3] Demands include 138,913 acre-feet per year of current contracts and future demands to be met by the BRA in the Region H. Future demands in Region H are to be met from uncontracted BRA supply, BRA System Operations, Allens Creek Reservoir, Little River Off-Channel Reservoir, and Freeport Desalination.

Table 8 Brazos River Authority Water Supplies (reservoir firm yield) (in acre-feet) for 2010-2060			
Source	**2010**	**2030**	**2060**
Lake Aquilla System	12,437	9,519	5,142
Little River System	211,856	206,994	199,699

Main Stem/Lower Basin System	414,491	410,439	404,360
Total Supply	**638,784**	**626,952**	**609,201**

**source: 2006 Region G Water Plan (Section 4A, Table 4A-6, page 4A-13)*

Table 9
Brazos River Authority
Projected Balances (in acre-feet) for 2010-2060

Projected Balances	**2010**	**2030**	**2060**
Lake Aquilla System	1,034	(1,884)	(6,261)
Little River System	(467)	(5,329)	(43,690)
Main Stem/Lower Basin System	(356,825)	(395,001)	(494,566)
Total Balance/(Shortage)	**(356,258)**	**(402,214)**	**(544,517)**

**source: 2006 Region G Water Plan (Section 4A, Table 4A-6, page 4A-13)*

The BRA water supplies from the reservoir firm yield of the Lake Aquilla System, Little River System, and Main Stem/Lower Basin System are complied in Table 8.

By comparing the BRA water demands to water supplies, the BRA projected balances are listed in Table 9.

Water contracts existing at each water source in the Brazos G Region that are currently or projected to provide water to another region were identified. The three BRA systems have been grouped into a single summary table in Table 10. The following table summarizes supply and demand of the BRA's reservoir and this summary is used to coordinate water supply from Brazos G used in Region H, Region C, and Region O.

Table 10
Supplies from BRA Available to Brazos G and Other Regions
(Existing Supplies and Recommended Water Management Strategies)
(in acre-feet per year)

BRA Reservoirs	**2000**	**2030**	**2060**
Permitted Diversion (Constructed Facilities)	661,901	661,901	661,901
Existing Reservoir Firm Yield (Stand-alone)	644,700	626,952	609,201

Long-Term Contract Holders/Water Management Strategies	Contract Amounts		
In Region G			
Long-Term Contracts	460,586	460,586	460,586
Uncontracted Current BRA Supply [1]	31,955	31,955	31,955
BRA System Operations [1]	-	62,196	62,196
In Region H			
Long-Term Contracts	138,913	138,913	138,913
Uncontracted Current BRA Supply [1]	29,000	29,000	29,000
BRA System Operations [1]	-	120,000	120,000
Allens Creek Reservoir [2]	-	29,895	29,895
Little River Off-Channel Reservoir [3]	-	40,000	40,000
Freeport Desalination	-	28,000	28,000
In Region O			
City of Lubbock [4]	961	961	961
In Region C [5]			
Parker County Steam Electric	0	4,000	4,000
Vulcan Materials Co.	2,000	2,000	2,000
Total Water Supply Available from BRA System			
Region G	492,541	554,737	554,737
Region H	167,913	385,808	385,808
Region O	961	961	961
Region C	2,000	6,000	6,000
Grand Total	663,415	947,506	947,506

**source: 2006 Region G Water Plan (Section 4A, Table 4A-21, page 4A-29)*

[1] Supplies from current BRA supplies and BRA System Operations as coordinated between Regions G and H. BRA System Operations would develop a maximum supply of 995,946 acre-feet per year when diverted in the lower basin, including 99,650 acre-feet per year from Allens Creek Reservoir, but excluding the Little River Off-Channel Reservoir (Vol. II, Table 4B.4-1). Allocation of system supply to upstream locations reduces overall BRA supply from the BRA reservoir system to approximately 945,061 acre-feet per year.

[2] Supply from water management strategy in Region H allocated to BRA (30% of 99,650 acre-feet per year). Region H has allocated 97,410 acre-feet per year of the supply from the strategy.

[3] The Little River Off-Channel Reservoir is a recommended water management strategy in Region H. Operated as part of the BRA System, it would supply an additional 40,000 acre-feet per year to Region H (Vol. II, Table 4B.4-14). Region H has allocated 32,125 acre-feet per year of that supply.

[4] Upstream supply contract to compensate BRA for loss of yield in Possum Kingdom Reservoir caused by Lake Alan Henry.

[5] Some supplies to Region C are accounted for in BRA contracts with Aquilla Water Supply District.

At the request of the BRA, the Brazos G RWPG evaluated several aspects of the BRA System Operations as a potential water management strategy for the 2006 Brazos G Regional Water Plan.

The evaluation was completed through three distinct tasks:

1. Incorporate the BRA System Operations into the Brazos G WAM and determine maximum amount that could be make available under the constraints of existing contractual obligations and future reservoir sedimentation conditions.

2. Determine the additional water supply would be made available by the BRA System Operations to Water User Groups (WUGs) with needs that could potentially utilize the additional supply.

3. Determine various effects of the proposed BRA System Operations:
   - on new water management strategies evaluated as being junior in priority to the proposed BRA appropriation;
   - on the increase in supply that could be made available by operating new water management strategies as part of the BRA System; and
   - on the increase in supply that could be made available from existing projects owned by other entities by operating those projects in conjunction with the BRA System.

For the Task 1 Evaluation:

According to the 2006 Regional G Water Plan, the BRA Operation System is under a hypothetical operation (diverting all supply near the Gulf), uncontrolled flow originating downstream of the BRA reservoirs is diverted during wet times, and firmed up by releases from storage in the upstream BRA reservoir during dry times. In this fashion, a total "system" yield can be developed that is substantially greater than the sum of the individual reservoir yields.

The Brazos G WAM was utilized to determine the availability of water from the BRA System. During the model simulations, the BRA contracts are met first from the BRA System, followed by the remaining amount that could be met at the Gulf of Mexico. Results of the water availability analysis are shown in Table 11.

Table 11 Water Availability from BRA System Operations (in acre-feet per year)					
Total BRA Permitted Diversions	**BRA Contractual Diversion**	**Diversions at Gulf**	**Total BRA System Diversions**	**Permitted Unutilized Yield**	**Unpermitted Yield**
761,551	600,946	395,000	995,946	160,605	234,395

**source: 2006 Region G Water Plan (Section 4B, Table 4B.4-1, page 4B.4-3)*

In Table 11, the sum of the BRA's existing contractual obligations included in this analysis total 600,946 acre-feet per year. When all remaining supply from the system is diverted at the Gulf after meeting upstream contractual commitments, an additional 395,000 acre-feet per year of firm supply could be developed by system operations of the BRA reservoirs. This total includes both currently permitted yield that is not utilized by existing contracts, and unpermitted yield that could be developed by the system operations.

For the Task 2 Evaluation:

In consideration of the water availability to Water User Groups (WUGs) with needs, 10 WUGs needs are able to be met exclusively by the BRA system without negatively impacting any existing BRA water supply obligations. As supply is taken upstream it causes a reduction of available supply at the downstream location that is greater than a 1:1 proportion, caused by the system's reduced ability to "firm up" the downstream uncontrolled flows.

For the Task 3 Evaluation:

If this application is granted, BRA System Operations would appropriate additional water in the Brazos River Basin with a priority date set in 2004. This would reduce the water available to any new appropriation, and would reduce the supply developed by any new water management strategy.
In order to determine the efficacy of including the BRA System Operations as a recommended water management strategies considered in the 2006 Plan, the potential effects of the new appropriation on other water management strategies considered for the 2006 Plan were evaluated by the Brazos G RWPG.

In the 2006 Region G Water Plan, nine water management strategies for all new reservoirs were evaluated with and without the proposed BRA System Operations in place. All nine reservoirs were operated as if junior to the proposed BRA System appropriation and would be required to pass flows when called on by the proposed new BRA water rights.

Two alternative analyses were completed for each reservoir: the first incorporated just the firm portion of the proposed BRA System Diversion at the Gulf of Mexico as a water right senior to

the new reservoir; the second analysis added the interruptible portion of the proposed appropriation as a water right to the new reservoir.

Table 12 presents the yields of each project operated as junior to the BRA System Operation (with and without interruptible water), and compares those yield to the yield if the reservoir were operated senior to the proposed BRA System appropriation.

Table 12
Yields of Reservoir Water Management Strategies Operated Junior to the BRA System Operations Appropriation

Water Management Strategy	Senior to BRA System Operations (acre-feet/year)	Junior to BRA System Operations (acre-feet/year)	
		Gulf Diversion, No Interruptible Water[1]	Gulf Diversion, with Interruptible Water[2]
Double Mountain Fork- East Site	40,100	8,625	5,000
South Bend	44,940 [3] (30,635)[4]	22,700[4]	14,700[4]
Millers Creek	-	-	-
Cedar Ridge	15,000 (32,570)[5]	13,900	12,0
Turkey Peak + Palo Pinto	19,130[6]	15,580	15,580
Groesbeck	950	200	200
Little River Off-Channel (108" diversion pipeline)	32,110	26,900	22,500
Little River On-Channel	124,000	93,480	92,000
Millican-Bubdic	38,080	31,800	30,750

[1] BRA System Diversion of 395,000 acre-feet /year at Gulf of Mexico, with 600,946 acre-feet/ year contracts diverted at contractual locations.
[2] Interruptible supply of 670,000 acre-feet/year diverted at Gulf of Mexico, with firm supply of 395,000 acre-feet/year at Gulf and 600,946 acre-feet/year contracts diverted at contractual locations.
[3] Yield of South Bend reservoir when operated in conjunction with Possum Kingdom Reservoir.
[4] These yields are based on the stand alone firm yield of South Bend Reservoir for purposes of Determining the impacts to the strategy.
[5] Includes subordination to Possum Kingdom Reservoir.
[6] Additional Yield due to Turkey Peak Reservoir is 8,648 acre-feet/year, keeping Palo Pinto Reservoir rights firm.

**source: 2006 Region G Water Plan (Section 4B, Table 4B.4-13, page 4B.4-18)*

Table 13 presents the increase in overall system supply that would be realized if these projects

were operated as part of the BRA System. In the 2006 Region G Water Plan, the total BRA authorization is indicated as 761,551 acre-feet per year and BRA contracts included in model is 600,946 acre-feet per year. The current permitted unutilized authorization is 160,605 acre-feet per year.

Table 13
BRA System Yield Results With Water Management Strategies Operated with BRA System Operations
(all values in acre-feet/year)

Water Management Strategy	Brazos G System Diversion Yield at the Gulf	Contracts Included in Model	Permitted Unutilized Yield	Unpermitted Yield	Total Potential Firm Supply from the BRA System
Base Yield without any WMS	395,000	600,946	160,605	234,395	995,946
Double Mountain Fork East Site	435,000	600,946	160,605	274,395	1,035,946
Cedar Ridge	423,000	600,946	160,605	262,395	1,023,946
South Bend	441,000	600,946	160,605	280,395	1,041,946
Turkey Peak + Palo Pinto	420,000	600,946	160,605	259,395	1,020,946
Little River Off-Channel (108-inch pipe)	435,000	600,946	160,605	274,395	1,035,946
Little River On-Channel	420,000	600,946	160,605	259,395	1,020,946
Millican-Bundic	425,000	600,946	160,605	264,395	1,025,946

**source: 2006 Region G Water Plan (Section 4B, Table 4B.4-14, page 4B.4-20)*

As shown in Table 13, the system yield increases that could be realized by incorporating individual new reservoirs into the BRA System generally are greater than the stand-alone yield of the projects themselves. This is primarily due to the reservoir storage being operated to "firm up" uncontrolled flows diverted at the gulf that originate downstream of existing BRA reservoir and downstream of the potential new reservoir.

The proposed BRA System Operations appropriation would add a considerable amount of firm supply to the Brazos River Basin that could be used in the Brazos G Area, but also in adjacent regions where the BRA supplies water, most notably Region H.
In the 2006 adopted Region G Water Plan, each wholesale water provider with a projected shortage, a water supply plan has been developed and Table 14 listed the BRA projected

shortages in 2030 and 2060. The projected shortages do not include Region H portion.

Table 14 BRA Projected Shortages in 2030 and 2060 (in acre-feet per year)		
Water User Group	**2030**	**2060**
Brazos River Authority (Lake Aquilla System)	1,884	6,261
Brazos River Authority (Little River System)	5,329	43,690
Brazos River Authority (Main Stem System)[1]	207,433	258,073
[1] Does not include Region H Portion		

**source: 2006 Region G Water Plan (Section 4C, Table 4C.38-1, page 4C-265)*

Based on the available surface water supply, the Lake Aquilla System is projected to have shortages of 1,884 and 6,261 acre-feet per year in 2030 and 2060, respectively. The projected shortages for the Lake Aquilla System may be overstated and they are based on a comparison of supplies and contracts, as opposed to a comparison of supplies and projected demands. Projected demands are less than the contracted amounts for supply from the Lake Aquilla System. In addition, the yield from Lake Aquilla was computed using estimated sedimentation rates based on a 1995 hydrographic survey. The BRA has noted that recent watershed modeling and hydrographic survey information indicates that sedimentation rates are considerably less, which would increase available supply from the reservoir. The BRA is actively monitoring sedimentation in the reservoir and has participated in programs aimed at reducing sediment load to the reservoir.

According to the adopted 2006 Regional G Water Plan and the planning criteria established by the Brazos G Regional Water Planning Group (RWPG) and Texas Water Development Board (TWDB), the following water supply plan is recommended to meet the projected shortages for the BRA Lake Aquilla System:

- **BRA System Operation (Volume II, Section 4B.4)**
  Surplus water supply from the Main Stem/Lower Basin portion of the overall BRA System can be used to argument supply at Lake Aquilla, either through direct diversion to and commingling of water, or through meeting Lake Aquilla water supply obligations from Main Stem/Lower Basin sources (Lake Granbury and/or Lake Whitney).

- **Alternative: Storage Reallocation of Federal Reservoirs (not studied for 2006 Brazos G Plan)**
  The BRA has initiated a study with the U.S. Army Corps of Engineers to study the potential for reallocating flood control storage in Federal reservoirs to water supply. The purpose would be to increase water supply yield to meet the growing water needs in the

Brazos River Basin. During Phase I, up to four alternative reallocation scenarios will be analyzed in each of nine reservoirs, taking into account hydrology and hydraulics, geotechnical data, engineering and design information, socioeconomic, environmental and cultural issues, and recreational considerations. Up to three reservoirs may be selected for the more detailed Phase II analyses required for implementation. Lake Aquilla could increase supplies from the reservoir and mitigate much of the projected shortage.

- **Alternative: Sediment Reduction Program (not studied for 2006 Brazos G Plan)**
  The BRA is monitoring the sediment accumulation rates in the agency's reservoirs, and is cognizant that a sediment reduction program at specific reservoirs may be required to maintain yield.

Based on the available surface water supply, the Little River System is projected to have shortages of 5,329 and 43,690 acre-feet per year in 2030 and 2060. Shortages for the Little River System are based on a comparison of supplies and current contractual commitments, not projected demands for those entities holding contracts with the BRA.

According to the adopted 2006 Regional G Water Plan and the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended to meet the projected shortages for the BRA Little River System:

- **BRA Systems Operation and Lake Granger Augmentation (Volume II, Sections 4B.4 and 4B.5)**
  The BRA has applied to the TCEQ for an additional appropriation of water that can be developed by utilizing its system of reservoirs to firm up uncontrolled runoff and return flows entering the basin below its reservoir system. Several of the water management strategies recommended to meet Water User Group needs would utilize this large potential supply of water. In addition to the firm supply, the BRA has requested appropriation of a large interruptible supply. The Lake Granger Augmentation project would utilize interruptible water in conjunction with groundwater development to dramatically increase firm supply from the reservoir. Modest needs in early decades would be supplied on an interim basis from existing BRA supplies made available by BRA Systems Operation.

- **Alternative: Groundwater Development (Volume II, Section 4B.15.1)**
  The BRA is exploring areas where groundwater resources could be used to better serve Little River System needs by providing additional supply.

- **Alternative: Millican-Bundic Reservoir (Volume II, Section 4B.12.7)**
  The BRA would develop the Millican-Bundic Reservoir in coordination with local sponsors/customers to meet future water demands in Region G. Supplies not utilized in Region G could be made available by the BRA to lower basin customers in Region H.

- **Alternative: Little River Off-Channel Reservoir (Volume II, Section 4B.13.5)**
  The BRA would develop the Little River Off-Channel Reservoir in coordination with local sponsors/customers to meet future water demands in Region G. Supplies not utilized in Region G could be made available by the BRA to lower basin customers in Region H.

- **Alternative: Storage Reallocation of Federal Reservoirs (not studied for 2006 Brazos G Plan)**
  The BRA has initiated a study with the U.S. Army Corps of Engineers to study the potential for reallocating flood control storage in Federal reservoirs to water supply. The purpose would be to increase water supply yield to meet the growing water needs in the Brazos River Basin. During Phase I, up to four alternative reallocation scenarios will be analyzed in each of nine reservoirs, taking into account hydrology and hydraulics, geotechnical data, engineering and design information, socioeconomic, environmental and cultural issues, and recreational considerations. Up to three reservoirs may be selected for the more detailed Phase II analyses required for implementation. Little River System Reservoirs that are candidates for storage reallocation are Lake Proctor, Lake Stillhouse Hollow, Lake Belton, Lake Georgetown, and Lake Granger.

- **Alternative: Sediment Reduction Program (not studied for 2006 Brazos G Plan)**
  The BRA is monitoring the sediment accumulation rates in the agency's reservoirs, and is cognizant that a sediment reduction program at specific reservoirs may be required to maintain yield.

Based on the available water supply, the BRA Main Stem/Lower Basin System is projected to have shortages of 395,001 and 494,566 acre-feet per year in 2030 and 2060, including the projected demands on the BRA Main Stem/Lower Basin System from Region H and supplies to Regions C and O. The projected shortages for the BRA Main Stem/Lower Basin System may be overstated. The projected shortages are based on a comparison of supplies and contracts, as opposed to a comparison of supplies and projected demands. Projected demands are less than the contracted amounts for several of the entities supplied by the BRA.

According to the adopted 2006 Regional G Water Plan and the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended to meet the projected shortages for the BRA Main Stem/Lower Basin System:

- **BRA Systems Operation (Volume II, Sections 4B.4)**
  The BRA has applied to the TCEQ for an additional appropriation of water that can be developed by utilizing its system of reservoirs to firm up uncontrolled runoff entering the basin below its reservoir system. Several of the water management strategies recommended to meet Water User Group needs would utilize this large potential supply of water. In addition to the firm supply, the BRA has requested appropriation of a large interruptible water supply. Conjunctive use of groundwater or other supplies along the

main stem and lower basin similar to the Lake Granger Augmentation strategy could be developed with the interruptible appropriation requested by the BRA. Interruptible supplies at Lake Somerville that are in excess of the firm yield of the reservoir could be firmed up through conjunctive use of nearby Carrizo-Wilcox groundwater.

- **Stonewall, Kent, and Garza County Chloride Control Project (This Strategy was studies in 2001 Brazos G Plan and recommended for the Brazos River Authority.)**
  The BRA, in coordination with representatives from Stonewall, Kent and Garza Counties is studying the feasibility of installing shallow recovery wells that would intercept chloride-laden groundwater before it discharges to major salt water-producing seeps and springs, and would lower the artesian pressure of the underlying saline aquifer so that the seeps and springs cease to flow. It is estimated that brine control at the site proposed in Stonewall County would reduce chloride concentration in the Brazos River above Possum Kingdom Reservoir by 45 percent. Similar recovery wells installed in Kent County would reduce chloride concentrations in the Brazos River by additional 10 - 15 percent. The brine would then be transferred to a solar salt evaporation facility near Post, Texas where the salt would be produced for commercial use. This strategy is an expansion of Chloride Control Option 3, which was studied for the 2001 Brazos G Regional Water Plan and was a water management strategy recommended for the Brazos River Authority.

- **Alternative: Storage Reallocation of Federal Reservoirs (not studied for 2006 Brazos G Plan)**
  The BRA has initiated a study with the U.S. Army Corps of Engineers to study the potential for reallocating storage in Federal reservoirs from flood control to water supply. The purpose would be to increase water supply yield to meet the growing water needs in the Brazos River Basin. During Phase I, up to four alternative reallocation scenarios will be analyzed in each of nine reservoirs, taking into account hydrology and hydraulics, geotechnical data, engineering and design information, socioeconomic, environmental and cultural issues, and recreational considerations. Up to three reservoirs may be selected for the more detailed Phase II analyses required for implementation. Main Stem /Lower Basin reservoirs that are candidates for storage reallocation are Lake Whitney and Lake Somerville. Reallocation of Lake Whitney was studied for the 2001 Brazos G Water Plan, but was not a recommended water management strategy.

- **Alternative: Sediment Reduction Program (not studied for 2006 Brazos G Plan)**
  The BRA is monitoring the sediment accumulation rates in the agency's reservoirs, and is cognizant that a sediment reduction program at specific reservoirs may be required to maintain yield.

In addition to the above strategies, the Region H RWPG has recommended several additional strategies for the BRA to supply needs in Region H as stated in Table 10. While the Brazos G RWPG acknowledges those Region H strategies, the Brazos G RWPG makes no recommendations regarding those strategies.

BRA System Operation is listed as the systems approach strategy in the summary of recommended water management strategies (Region G Water Plan, Section 4C, Table 4C.39-1, page 4C-285) involving new sources of supply by the Brazos G Regional Water Planning Group (BGRWPG).

Implementation of the 2006 Brazos G Regional Water Plan will result in the development of new water supplies that will be reliable in the event of a repeat of the most severe drought on record.

2006 Regional G Water Plan also states it is evident that implementation of all recommended water management strategies is not likely to be necessary in order to meet projected needs within the planning period.

The BGRWPG explicitly recognizes the difference between additional supplies and projected needs as System Management Supplies and has recommended the associated water management strategies in the Regional Water Plan for the following reasons:

- So that water management strategies are identified to replace any planned strategies that may fail to develop, through legal, economic or other reasons;
- To serve as additional supplies in the event that rules, regulations, or other restrictions limit use of any planned strategies;
- To facilitate development of specific projects being pursued by legal entities for reasons that may not be captured in the supply and demand projections used to identify future supply shortages; and/or
- To ensure adequate supplies in the event of a drought more severe than which occurred historically.

SECTION IV
EVALUATION OF THE DROUGHT CONTINGENCY PLAN

BRA's drought contingency plan meets the minimum requirements of Title 30, TAC Chapter 288 for wholesale water suppliers. The plan consists of the minimum requirements as follows:

1. Public input to the plan
2. Ongoing public education
3. Coordination with regional water planning group
4. Notification procedures for customers, media, and elected officials
5. Trigger conditions signaling the start of any identified drought period
6. Drought water-use measures corresponding to each trigger condition
7. Drought response stages
8. Supply or demand management measures implemented during each stage to Include pro rata curtailment and alternative water sources
9. Requirement in every wholesale water contract that in a shortage water will be

distributed in accordance with TWC §11.039

10. Enforcement procedures
11. Procedures for granting exceptions
12. Adoption of plan by BRA

SECTION V
CONCLUSIONS AND RECOMMENDATIONS

Brazos River Authority meets the minimum requirements for conservation plans for wholesale water suppliers as stipulated in Title 30, TAC, Chapter 288.

The strategies and programs set forth by BRA appear to be appropriate for achieving the water conservation goals.

Recommendations:

The conservation staff of the Resource Protection Team recommends that the application from the BRA should be granted.

This recommendation is based on that the BRA System Operation is listed as the systems approach strategy in the Region G Water Plan summary of recommended water management strategies involving new sources of supply by the Brazos G Regional Water Planning Group (BGRWPG). Therefore, this request is not inconsistent with the approved 2006 Region G Water Plan and 2007 State Water Plan.

The following standard water conservation language should be included in the permit:
"Owners shall implement water conservation plans that provide for the utilization of those practices, techniques, and technologies that reduce or maintain the consumption of water, prevent or reduce the loss or waste of water, maintain or improve the efficiency in the use of water, increase the recycling and reuse of water, or prevent the pollution of water, so that a water supply is made available for future or alternative uses. Such plans shall include a requirement that in every wholesale water contract entered into, on or after the effective date of this amendment, including any contract extension or renewal, that each successive wholesale customer develop and implement conservation measures. If the customer intends to resell the water, then the contract for resale of the water must have water conservation requirements so that each successive wholesale customer in the resale of the water be required to implement water conservation measures."

PROPOSED WATER RIGHT PERMIT NO. 5851

APPLICATION OF BRAZOS RIVER AUTHORITY FOR PERMIT NO. 5851	§ § §	BEFORE THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

2006 MAY -4 AM 10: 29
CHIEF CLERKS OFFICE
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

EXECUTIVE DIRECTOR'S RESPONSE TO COMMENTS

The Executive Director files this Response to Comments made at the May 17, 2005 public meeting on Brazos River Authority's (BRA) application for a water right, Permit No. 5851 (the "application"), and the written comments received after that meeting. The Executive Director responds to the written and verbal comments made at the meeting and received after the public meeting until the deadline for comments on June 13, 2005.

BACKGROUND

BRA's filed an application with the TCEQ on June 25, 2004. The application was declared administratively complete on October 15, 2004 and mailed notice was issued on April 22, 2005. Published notice was provided in 27 newspapers on May 11-13, 2005. At the time of this Response to Comments, the TCEQ was beginning technical review of the application.

In its application, BRA requests the following:

- A new appropriation of state water in the amount of 421,449 acre-feet per year for multiple use purposes including domestic, municipal, agricultural, industrial, mining, and other beneficial uses on a firm basis in the Brazos River Basin. The entire 421,449 acre-feet is available only if all of it is diverted at the mouth of the Brazos River, and can only be made available by the BRA through the system operation of its water rights.

- Diversion of the water to be authorized from:
  - existing diversion points authorized by BRA's existing water rights;
  - Brazos River at USGS gage No. 08091000 near Glen Rose, Texas;
  - Brazos River at USGS gage No. 08098290 near Highbank, Texas;
  - Brazos River at the Gulf of Mexico
  - diversion points identified and included in BRA's proposed Water Management Plan.

- Use of up to 90,000 acre-feet of water per year of its firm supply to produce and appropriate an interruptible water supply of 670,000 acre-feet per year.

- Exempt interbasin transfer, on a firm and interruptible basis, to the adjoining San Jacinto-Brazos Coastal Basin and the Brazos-Colorado Coastal Basin, service areas not within the Brazos River Basin.

- An appropriation of current and future return flows (treated sewage effluent and brine bypass/return). Specified discharge points and amounts of water will be accounted for on a monthly basis as part of BRA's Water Management Plan

- Operational flexibility to:
  - use any source of water available to the applicant to satisfy the diversion requirements of senior water rights
  - release, pump, and transport water from any of the applicant's reservoirs for subsequent storage, diversion and use throughout the applicant's service area.

- Recognition that the System Operation Permit will prevail over inconsistent provisions in the applicant's existing water rights regarding system operation.

- Use of the bed and banks of the Brazos River, its tributaries, and BRA reservoirs for conveyance, storage, and diversion of:
  - water appropriated by this application
  - water conveyed via pipelines and subsequently discharged into the Brazos River system
  - surface water imported from outside the Brazos River Basin for subsequent use
  - in-basin surface water and groundwater subject to the applicant's control
  - water developed from future applicant projects
  - current and future reuse of surface and groundwater-based effluent requested by this application.

- Bed and banks authorization to be subject to obtaining future authorizations; points to be identified and included in BRA's proposed Water Management Plan

COMMENTERS AT THE PUBLIC MEETING

Larry Wilson
Daniel Meadows
Environmental Services for Texas ("EST")
Texas Westmoreland Coal Company ("TWCC")
Texas Mining and Reclamation ("TMR")
Jack Cathey
Chocolate Bayou Water Company ("CBWC")
Pat Kultgen
Bridges Hague
Friends of Brazos River ("Friends")

WRITTEN COMMENTERS

Flying "A" Ranch ("FAR"), c/o Perry and Margie Adams (the "Adams")
Fort Bend County Levee Improvement District No. 11, Fort Ben County Levee Improvement District No. 15, Fort Bend County Municipal Utility District No. 106, Pecan Grove Municipal Utility District, and Sienna Plantation Municipal Utility District (referred to jointly as "Fort Bend County Districts")
Chocolate Bayou Water Company ("CBWC")
Brazos Old Fields, c/o Lawrence Wilson
Jack Weldon Bridges III
George Bingham, Juanita Sue Bingham, Brian Bingham, Kellie Bingham, and Carey Bingham (the "Binghams")
Lowwater Bridge Canoe Rental ("LBCR"), c/o Jack Cathey, owner
Rick and Christie Clark
Rhino Ridge Outfitters ("RRO"), c/o Adam Eyres, President
Adam Eyres, individualy
Dorothy Gibbs
John Graves
Friends of the Brazos River ("Friends")
Bob Huddleston
Jean F. King
James R. And Melodie Isham
Dow Chemical Company ("Dow")
Association of Electric Companies of Texas ("AECT")
Mary Lee Lilly
Bridges Hague
Walnut Creek Mining Company ("Walnut Creek")
City of Bryan and City of College Station ("Cities")
National Wildlife Federation ("NWF")
Palo Pinto County Municipal Water District No. 1 ("Palo Pinto District")
Jerry Swink
Texas Genco II, LP
Texas Westmoreland Coal Co. ("TWCC")
Texas Municipal Power Agency ("TMPA")
Texas Mining and Reclamation Association ("TMRA")
Scott and Linna Trees
TXU Power Company ("TXU")
Matthews Land & Cattle Company ("MLCC")
AEP Texas North Company ("AEP")
W.C. Walker
Nancy Stackhouse Wilson
City of Lubbock ("Lubbock")
H. Jane Vaughn

RESPONSE TO COMMENTS

APPLICATION:

COMMENT NO 1: The Fort Bend County Districts comment that the notice given for this application was inadequate because it did not provide the public the opportunity to obtain a copy of the permit application and related supporting documents, including, for example, BRA's Management Plan.

RESPONSE NO 1: The Executive Director disagrees that the notice was deficient. The notice provided the address of the TCEQ, and names and telephone numbers for anyone interested in obtaining more information about the application. BRA does not have an existing Management Plan for the public to review.

COMMENT NO. 2: The Fort Bend County Districts and Friends state that the notice mailed for this application was defective because the application was not administratively complete and because dischargers of the return flows should have been given notice of the application.

RESPONSE NO. 2: The Executive Director does not agree that the application was not administratively complete or that dischargers should have been given notice of this application. The application provided enough information to begin a technical review of the application. Further information may be requested from BRA as the technical review progresses. The TCEQ rules do not provide that dischargers should receive notice of a water rights application. There is no possibility that a discharger's permit can be harmed by this application. Under the Water Code, persons do not have a right to notice that someone else has requested water simply because they themselves may wish to appropriate that water.

COMMENT NO. 3: Dow, Friends, and CBWC state that the application is complicated and vague and there needs to be a contested case hearing on this matter so that water right holders can determine if their rights will be impacted. Friends specifically comments that the location of amounts and diversion points are not detailed, details of the system operation are not provided, timing of releases are not provided, environmental impacts are not analyzed or detailed. Bob Huddleston also comments that the application is broad and it is hard to understand the impact.

RESPONSE NO. 3: Friends and CBWC have requested a contested case hearing. Their request, along with the other requests for contested case hearing, will be considered by the Commission at a regular open meeting in the future.

The application requests specific maximum amounts of both firm and interruptible unappropriated water at or above three identified points. The location of amounts, rates, system operation and environmental flow constraints will be detailed in BRA's Management Plan once the specific amount of unappropriated water and return flows

available to the applicant under this application are determined. The Management Plan will be submitted to the Commission for approval at a later date as discussed more below under "Management Plan."

COMMENT NO. 4: CBWC and Friends comment that the application needs to contain more information such as diversion points and diversion rates before the TCEQ reviews it. Friends states that the application should not have been declared administratively complete.

RESPONSE NO. 4: The Executive Director disagrees. At least three specific diversion points, as well as all of the BRA's existing diversion points were included in the notice of the application. The additional water would be made available by the BRA through system operation of its existing water rights. The location of amounts and rates diverted from any additional points will be detailed in BRA's Management Plan once the specific amount of unappropriated water and return flows available to the applicant at or above the points specified in the application are determined. The Management Plan will be submitted to the Commission for approval at a later date as discussed more below under "Management Plan."

COMMENT NO. 5: Friends and Dow question whether BRA has shown beneficial uses for the new water. Friends asks whether other water suppliers can supply some of the future water needs of the basin.

RESPONSE NO. 5: The Executive Director responds that during technical review staff will look at whether the water can be beneficially used. BRA has requested water for municipal, industrial, and recreational use. Whether other water suppliers can meet the needs of the basin is generally not a factor that must be considered in determining whether a permit should be issued, unless the State or relevant Regional Water Plan states this. If there is a contested case hearing, parties can raise this issue.

COMMENT NO. 6: Friends states that BRA has not shown that is will conserve water as required by the Water Code. Specifically, BRA has not shown that it has reduced demand for water. A shortfall in the demand is not enough to indicate that BRA will conserve water.

RESPONSE NO. 6: The Executive Director's staff will consider this comment under its rules in Chapter 288 when the Conservation Team conducts its technical review.

COMMENT NO. 7: The Fort Bend County Districts comment that the TCEQ lacks the statutory authority to grant the permit as requested, and BRA lacks the statutory authority to hold or implement the requested "System Order" permit.

RESPONSE NO. 7: The Executive Director disagrees that the TCEQ does not have the authority to review and consider issuance of this permit. The Executive Director's staff is

still in technical review, and will consider BRA's authority to implement this system operation in its review of the application.

COMMENT NO. 8: The Fort Bend County Districts comment that the application is detrimental to the public welfare because BRA is asking for public entities' wastewater, which they have spent considerable capital designing and constructing. The Districts will have to construct more facilities to keep the wastewater out of the river if they wish to reuse their effluent, and they may be forced to buy effluent or other water sources to reduce groundwater dependence as required by the Fort Bend County Subsidence District. The taxpayers will pay for this.

RESPONSE NO. 8: If there is a contested case hearing, parties can raise these issues and the Administrative Law Judge and Commission will decide if these issues are relevant to whether the application is detrimental to the public welfare.

APPROPRIATION OF ALL WATER:

COMMENT NO. 9: Texas Genco comments that allowing such a large volume of unappropriated water and not requiring pass through of flows from its reservoirs, along with the appropriation of current and future return flows, would threaten its senior water right and have a critical adverse impact on Genco and its customers.

RESPONSE NO. 9: The Executive Director responds that these issues will be considered during the hydrology review of this application. BRA has requested unappropriated historic and future return flows in the Brazos Basin and that request will be reviewed under statutory law and the TCEQ rules.

COMMENT NO. 10: Dow, The City of Lubbock, National Wildlife Federation, TXU, TMPA, TWCC, TMRA, Friends, CBWC, and Bridges Hague comment that it appears that BRA wants to permit all of the remaining water in the river in this application and wants to own and control all of this water. BRA will be the manager of this water instead of TCEQ.

RESPONSE NO. 10: BRA is requesting a large amount of water. However, any permit that may be issued for this application will contain streamflow restrictions to protect environmental uses. Also, much of the water that BRA is requesting to use is water that is presently in storage. The TCEQ will regulate any permit issued to BRA and will require compliance with the Texas Water Code and TCEQ rules. The Executive Director's staff will review any Management Plan submitted by the BRA prior to BRA taking any new water. Any permit issued by the TCEQ will require BRA to prepare a Management Plan that contains certain specific elements and that will be subject to notice and an opportunity for a contested case hearing.

COMMENT NO. 11: Dow comments that although BRA used the TCEQ's Water Availability Model to support its assertion that its system operation will result in an increase in firm yield of

available water, BRA substantially modified that model in its calculations. BRA needs to prove that its modeling is correct.

RESPONSE NO. 11: The Executive Director's staff will do its own hydrology review of this application in order to determine if the Executive Director recommends issuance of a permit for the amount of water requested by BRA. Dow has requested a contested case hearing. If there is a hearing, BRA will likely produce its modeling results at that hearing.

COMMENT NO. 12: AECT and AEP comment that they are concerned about how much water is available for appropriation in the river, how accurate BRA's water availability models are, whether BRA can obtain interbasin transfers after it receives a permit for this water, and whether their water rights can be affected by this application.

RESPONSE NO. 12: The Executive Director responds that the amount of water available for appropriation will be determined when staff performs its hydrology review of this application. The request for an exempt Interbasin Transfer will also be reviewed by the Executive Director's staff. Staff consider impacts on existing water rights in their hydrology review. This issue can also be raised at a contested case hearing.

COMMENT NO.13: TXU comments that it will need permits in the future for its operations and this application would have a significant impact on it by eliminating the option of requesting a new appropriation of water from the TCEQ.

RESPONSE NO. 13: Depending on the size or the proposed use of these diversions, issuance of BRA's requested permit could impact the ability of persons or entities to obtain new permits in the river basin. The TCEQ cannot know for sure until it evaluates BRAs application and provides a recommendation. The impact on the ability of other applicants to request new appropriations of water in the Brazos Basin subsequent to any permit issued to the BRA cannot be determined until TCEQ receives an application and staff conducts a hydrological and environmental review of those applications.

<u>BRA'S MANAGEMENT OF THE RIVER:</u>

COMMENT NO. 14: W.C. Walker, Larry Wilson, TMPA, and Bridges Hague comment that BRA should have a Management Plan now. These people, Lawrence Wilson, and Flying "A" Ranch also comment that BRA has not shown competence in managing the Brazos River. H. Jane Vaughn comments that BRA will make decisions in managing the river that will hurt landowners downstream of Lake Granbury.

RESPONSE NO. 14: If BRA has violated its water rights or statutes within the TCEQ's jurisdiction or TCEQ rules, persons may contact the region office at 6801 Sanger Avenue, Suite 2500, Waco, Texas, or call (254) 751 0335. Any draft permit issued by the Executive

Director will require BRA to prepare a Management Plan that contains specific elements and that will be subject to notice and an opportunity for a contested case hearing.

ECONOMY OF AREA:

COMMENT NO. 15: Jean King, Jack Cathey, Jerry Swink, Mary Lee Lilly, Bridges Hague, RRO, Adam Eyres, LBCR, Rick Clark, and Christie Clark comment that the Glen Rose economy is based on the river. The area relies on tourism and recreation. This application could impact this economic base.

RESPONSE NO. 15: The Executive Director recognizes the importance of the river to the economy of the Glen Rose area. While the TCEQ considers impact on recreational use, the TCEQ cannot consider impact on the economy of the area in water rights permitting except as it may bear on the public welfare. The TCEQ's jurisdiction is limited to its statutory authority, which includes consideration of any detriment to the public welfare from the issuance of a permit.

FLOWS FOR THE ENVIRONMENT AND RECREATION:

COMMENT NO. 16: The Fort Bend County Districts request that the Commission consider the instream uses on the stream and the flows necessary to maintain those uses in the stream.

RESPONSE NO. 16: The Executive Director's staff will perform an environmental review of this application to determine the impact the application may have on the environment. In its review, the Executive Director's staff will also consider the impact on the environment of taking effluent out of the stream for effluent that has been historically discharged to the river under Tex. Water Code Section 11.042(c).

COMMENT NO. 17: Jerry Swink, Jack Cathey, and Lawrence Wilson comment that the sale of water has diminished the flow of water in the Brazos River, causing drying up of fishing holes and making boating and tubing impossible due to low water, algae and slime. The TCEQ should not grant this application without an environmental impact study.

RESPONSE NO. 17: The National Environmental Policy Act (NEPA) requires federal agencies to integrate environmental values into their decision making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. To meet this requirement, federal agencies must, for certain federal actions, prepare detailed statements known as an Environmental Impact Statements (EIS). An EIS is not required for state actions such as this permit.

However, the Executive Director's staff will perform an environmental review of this application to determine the impact the application may have on the environment. Staff

reviews the application for environmental impacts on the river, including water quality, and recommends streamflow restrictions or other special conditions in the permit to mitigate adverse impacts, if any.

Research on instream flows is currently underway on the Brazos River as part of the legislative requirements of S.B. 2 (2001). The Brazos is one of the priority river basins. Review of previously collected biological, hydrological, geomorphological, and water quality is in progress. Biological, hydrological, and geomorphological studies in cooperation with BRA and other parties are underway to document baseline river conditions. In-depth instream flow studies will be developed with public input and executed over the next several years to support the development of instream flow criteria in the Brazos River Basin. This work is due to be completed by December 31, 2010. Data from these studies may be used for environmental protection for this application or the subsequent Management Plan.

COMMENT NO. 18: Jean King, Melodie Isham, Nancy Stackhouse Wilson, Larry Wilson, Jack Cathey, Mary Lee Lilly, and Bridges Hague, state that in the past few years water in the river has changed and is no longer clear. These people along with John Graves, Scott and Linna Trees, Dorothy Gibbs, RRO, Adam Eyres, Rick Clark, H. Jane Vaughn, Christie Clark, LBCR, Jack Bridges, III, Lawrence Wilson, and FAR further state that there are no fish, a diminished quality of water and life on the river, and a loss of wildlife. The water is stagnant and highly polluted and people cannot recreate as they did before.

RESPONSE NO. 18: The Executive Director's staff reviews the application for environmental impacts on the river, including water quality, and recommends streamflow restrictions or other special conditions in the permit to mitigate adverse impacts, if any. Existing impacts to the river can be addressed in an enforcement action if the problem is due to BRA violating its existing water rights or water quality permits, or TCEQ rules.

COMMENT NO. 19: CBWC comments that the quality of the river must be examined. In particular, the salt water intrusion at the mouth of the river should be studied. Dow is concerned that BRA's application does not fully and properly take into account the increasing salt water intrusion problem faced by Dow.

RESPONSE NO. 19: The Executive Director's staff reviews the application for environmental impacts on the river, including water quality, and recommends streamflow restrictions or other special conditions in the permit to mitigate adverse impacts. Saltwater intrusion will be examined and special conditions could be recommended if necessary.

COMMENT NO. 20: Pat Kultgen and Friends, FAR, Lawrence Wilson, LBCR, RRO, Adam Eyres, and John Graves comment that there must be adequate instream flows for the environment.

RESPONSE NO. 20: The Executive Director's staff will perform an instream flow and inflows to the bay and estuary analysis for this application to determine if the application could impair instream uses. If staff determines that there could be impact, staff will recommend streamflow restrictions or other permit provisions to mitigate that impact. At this time, prior to an environmental review, staff does not know if the 100,000 acre feet of interruptible water committed by BRA to the Water Trust is adequate to protect the environmental needs of the river in this application.

COMMENT NO. 21: Friends argues that BRA should be required to perform a full environmental impact analysis for this application.

RESPONSE NO. 21: The National Environmental Policy Act (NEPA) requires federal agencies to integrate environmental values into their decision making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. To meet this requirement, federal agencies must, for certain federal actions, prepare detailed statements known as an Environmental Impact Statements (EIS). An EIS is not required for state actions such as this permit.

However, research on instream flows is currently underway on the Brazos as part of the legislative requirements of S.B. 2 (2001). The Brazos is one of the priority river basins. Review of previously collected biological, hydrological, geomorphological, and water quality is in progress. Biological, hydrological, and geomorphological studies in cooperation with BRA and other parties are underway to document baseline river conditions. In-depth instream flow studies will be developed with public input and executed over the next several years to support the development of instream flow criteria in the Brazos River Basin. This work is due to be completed by December 31, 2010. Data from these studies may be used for environmental protection for this application or the subsequent Management Plan.

COMMENT NO. 22: National Wildlife Federation comments that the new appropriation has a tremendous potential to significantly affect the fish and wildlife resources of the river and the ability of people to use and enjoy the river. Any water management plan must, at a minimum, establish definite and enforceable criteria adequate to ensure that any future version of such a plan will ensure adequate protection of the environment.

RESPONSE NO. 22: The Executive Director's staff will perform an instream flow and inflows to the bay and estuary analysis for this application to determine if the application could impair those uses. If staff determines that there could be impact, staff will recommend streamflow restrictions or other permit provisions to mitigate that impact. If there is a contested case hearing, National Wildlife Federation may be able to be a party and can present evidence on its recommended flows. Absent a hearing, staff would welcome any information the Federation wishes to provide. Also, the Executive Director may require that environmental impacts be addressed in a subsequent Management Plan, which will be

subject to notice, comment, and opportunity for a contested case hearing.

COMMENT NO. 23: Rick Clark, Christie Clark, Jack Bridges, III, state that there are times when the water of the Brazos River becomes a health hazard when used for recreational purposes.

RESPONSE NO. 23: The Executive Director's staff will perform an environmental review for this application to determine if the requested actions could cause these problems. This review will include impact on recreational uses. If staff determines that there could be an impact, staff will recommend special conditions to mitigate that impact. If there is a contested case hearing, these commenters may be able to be a party and can present evidence on the water quality of the river. Absent a hearing, staff would welcome any additional information the commenters wish to provide.

IMPACT ON WATER RIGHT HOLDERS:

COMMENT NO. 24: MLCC comments that domestic and livestock users will be impacted by this application.

RESPONSE NO. 24: The Executive Director responds that domestic and livestock owners are not specifically protected in the TCEQ's water availability analysis because they are not regulated and are mostly unknown. We believe that the fact that water rights are protected at their full authorized amount for a new appropriation may help mitigate impacts to domestic and livestock users.

COMMENT NO. 25: AEP and AECT are concerned that BRA's application will impact its power plants' water rights and contracts that member utilities have for water.

RESPONSE NO. 25: The Executive Director responds that staff will determine how much water is available for BRA to appropriate after protection of all existing water rights to the maximum extent of their authorizations.

COMMENT NO. 26: CBWC comments that its water rights may be impaired and that there must be adequate streamflow in the river for the other water right holders in the river. BRA must pass through inflows through its reservoirs. Where is BRA's compliance with that requirement documented?

RESPONSE NO. 26: The Executive Director does not know if BRA keeps a record of passing inflows downstream. BRA's permits do not require that BRA keep records, nor does the Water Code or TCEQ rules. If the commenter believes that BRA is not passing inflows downstream, as required by its water rights or the Water Code, it can contact the Regional Office in Waco at (254) 751 0335.

COMMENT NO. 27: The City of Lubbock comments that BRA's application will adversely impact the supply and availability of the water that is the subject of the City's water rights, permits, applications, strategic plan, and strategic objectives. The application will impede appropriate development and reuse of water supplies in the Lubbock area.

RESPONSE NO. 27: The Executive Director's staff will perform a water availability analysis on this application and only recommend issuance of a permit for water that has not been appropriated by others. Pending applications are not considered water rights and therefore are not protected in a water availability model. Any issued water rights will be subject to the priority system relating to who can get their water first. If there is a contested case hearing, the City can present evidence on impairment of its water rights and plans.

COMMENT NO. 28: W.C. Walker asks what safeguards will prevent massive withdrawals from Possum Kingdom Lake or from the river above Possum Kingdom Lake. The lake is already down so that Granbury and Whitney can be kept full.

RESPONSE NO. 28: The Executive Director's staff is reviewing the application and will consider this comment. However, the operation of the reservoirs is usually left to the river authority unless its water right provides otherwise or a particular operation impacts water right holders or the environment.

COMMENT NO. 29: The Binghams hold Certificate of Adjudication No. 12-3580 and Permit No. 4264, and they state that the BRA's application may impact the reliability and continued availability of water for their water rights.

RESPONSE NO. 29: The Executive Director is reviewing the application and will consider this comment. Further, the Executive Director's staff will perform a water availability analysis on this application and only recommend issuance of a permit for water that has not been appropriated by others. Any issued water rights will be subject to the priority system relating to who can get their water first. If there is a contested case hearing, the Binghams can present evidence on impairment of their water rights.

MANAGEMENT PLAN:

COMMENT NO. 30: Dow and AECT comment that they are concerned that BRA does not have a Management Plan at this point and that it will not be finalized until after the permit is issued to BRA. There will not be sufficient public participation on the Management Plan. The Management Plan should be part of a contested case hearing.

RESPONSE NO. 30: The Executive Director will require a Management Plan if any permit is issued for this application. Any permit will require this Management Plan prior to BRA taking any new water, and will require an amendment to the permit. Notice and an

opportunity for a contested case hearing will also be part of this application.

COMMENT NO. 31. CBWC asks whether BRA would support a watermaster to implement its Water Management Plan. Dow comments that the "self-policing" nature of a Water Management Plan, on its face, cannot be considered a reliable mechanism for assuring the protection of senior water rights.

RESPONSE NO. 31: The Executive Director does not know if BRA would support a watermaster. The Executive Director would not recommend that the Commission require BRA to have a watermaster to enforce any permit issued to BRA because under the Water Code the Executive Director does not appoint watermasters for only one water right holder. However, the water right holders in the area can petition for a watermaster for the Brazos River Basin under Chapter 11 Subchapter I of the Water Code.

COMMENT NO. 32: Friends states that BRA is trying to do what LCRA did on a management plan for the Colorado. However, LCRA negotiated for a long time on what provisions should be in the management plan. There is no real shareholder involvement for this application.

RESPONSE NO. 32: The Executive Director agrees that the process for the LCRA Management Plan, which was required as part of the adjudication of LCRA's water rights, was a different process than the process for this application. However, for this application, water right holders in the Brazos River were notified of the application and given the opportunity to comment or file a request for a contested case hearing. A public meeting was held in Waco concerning this application. Also, prior to taking new water, the applicant will be required to prepare a Management Plan, which will require notice and an opportunity for a contested case hearing.

COMMENT NO. 33: Friends states that BRA has not shown that it will beneficially use the requested water and cannot indicate this without a Management Plan.

RESPONSE NO. 33: The Executive Director's staff will look at beneficial use of this water when it conducts its Water Conservation Review. BRA may show beneficial use prior to finalizing a Management Plan by providing other documents and sharing information in the State or Regional water plan.

<u>MINING INDUSTRY:</u>

COMMENT NO. 34: Walnut Creek, TMPA and TWCC comment that the lignite mining industry has a present and future need for water from the Brazos River for mining and cooling ponds. In fact, a shortfall of water has been projected in Grimes County for mining needs.

RESPONSE NO. 34: The Executive Director's staff will perform a water availability

analysis to determine if other water rights can be injured by this application. Depending on the results of that analysis, there could be special conditions in any permit or even denial of this application. The Executive Director's staff cannot consider any future applications when reviewing an application for a new water right – only the existing water rights will be senior to the new one.

COMMENT NO. 35: Walnut Creek, TMPA, TWCC, and TMRA state that the mining industries reclamation plans call for water rights to be obtained from the TCEQ. They are concerned that if the BRA permit is granted, their permits could be denied. This could impact their ability to comply with reclamation permits, and may force them to have to pump groundwater or buy water from BRA.

RESPONSE NO. 35: Depending on the size or the proposed use of these water impoundments, issuance of BRA's requested permit could impact the ability of persons or entities to obtain new permits in the river basin. The Executive Director cannot know for sure until it evaluates BRA's application and provides a recommendation. The impact on the ability of other applicants to request new appropriations of water in the Brazos Basin subsequent to any permit issued to the BRA cannot be determined until TCEQ receives an application and staff conducts a hydrological and environmental review of those applications.

COMMENT NO. 36: TMRA comments that the mining industry provides half of the tax base for several counties in the area and lots of dollars for the state. Their reclamation activities benefit the area in other ways by providing habitat, recreation, and environmental restoration. All of these activities could be impaired by this application.

RESPONSE NO. 36: The Executive Director understands the economic benefits the mining industry provides to the community. Concerning the mining industry's water rights, staff will review the application to determine the applications' impact on existing water rights. Concerning the mining industry's reclamation activities, depending on the size or the proposed use of these water impoundments, issuance of BRA's requested permit could impact the ability of persons or entities to obtain new permits in the river basin. The TCEQ cannot know for sure until it receives an application and conducts a hydrological and environmental review of those applications. The impact on the ability of other applicants to request new appropriations of water in the Brazos Basin subsequent to any permit issued to the BRA cannot be determined until TCEQ receives an application and conducts a hydrological and environmental review of those applications.

<u>RETURN FLOWS:</u>

COMMENT NO. 37: Pat Kultgen and Friends commented that the municipalities in the area should be issued permits for return flows, not BRA. BRA is asking to be first in line for these

return flows.

RESPONSE NO. 37: BRA has requested these return flows. Under law, the Commission must grant the application if it meets the requirements of our statutes and rules. Determination of whether BRA has met these requirements will be considered during technical review and in any contested case hearing on the application. Municipalities may also file applications for the return flows from their water rights or wastewater treatment plants. The Executive Director's staff will review all these applications, including BRA's, in the order in which they are declared administratively complete.

COMMENT NO. 38: Cities, the Fort Bend County Districts, and the City of Lubbock state that BRA's application requests to take their return flows that are valuable assets and that they also are requesting or will request to reuse.

RESPONSE NO. 38: Under law, the Commission must grant an application if it meets the requirements of our statutes and rules. Determination of whether BRA has met these requirements will be considered during technical review and in any contested case hearing on the application. The commenters may also file applications for the return flows from their water rights or wastewater treatment plants. The Executive Director's staff will review all these applications, including BRA's, in the order in which they are declared administratively complete.

COMMENT NO. 39: The Fort Bend County Districts state that if BRA is granted the District's return flows, it will have to construct off channel storage and transportation systems to keep the effluent out of the receiving streams. This would be an unnecessary waste of taxpayer money.

RESPONSE NO. 39: The Commission may consider this comment to the extent that it may bear on whether the application is detrimental to the public welfare. However, there is no specific provision in the TCEQ's authorization that allows the TCEQ to consider costs to existing water right holders in issuing a permit.

COMMENT NO. 40: Dow comments that appropriating return flows from treated effluent and brine bypass/returns to BRA would be detrimental to Dow because Dow has relied on those flows for meeting its own senior water right. BRA doesn't specify the amount of return flows it is requesting but leaves that to the Management Plan.

RESPONSE NO. 40: The Executive Director will consider other water right holder's reliance on historically discharged return flows if it issues a permit for these return flows. This application requests a total appropriation that includes 2060 return flows. The request includes both historically discharged and hypothetical future effluent. The Executive Director and the TCEQ will evaluate BRA's request for return flows in accordance with applicable laws and rules.

SYSTEM OPERATION:

COMMENT NO. 41: TMPA comments that the system-wide management that BRA has requested is unproven.

RESPONSE NO. 41: The Executive Director's will have to consider the effectiveness and feasibility of the system operation proposed by BRA in its review of this application. Special conditions in the permit to ensure the effectiveness of system-wide management could be required.

COMMENT NO. 42: Friends comments that BRA can have system operations under their existing system order.

RESPONSE NO. 42: The Executive Director agrees that BRA has an existing system order that allows it flexibility in when and where water is diverted. However, this application goes further than that order and also requests additional water.

COMMENT NO. 43: Friends and National Wildlife Federation assert that BRA needs to amend it underlying permits as well as just having a stand-alone system permit.

RESPONSE NO. 43: The Executive Director's staff will consider this comment when it conducts its technical review.

MISCELLANEOUS COMMENTS:

COMMENT NO. 44: TMRA comments that issuance of this permit will lead to more use of groundwater in the area. There is no guarantee that groundwater will be available in the future.

RESPONSE NO. 44: The Executive Director does not know if issuance of this permit would lead to more use of groundwater in the future. The Executive Director cannot base his recommendations to the Commission on this possibility because this is not a factor for consideration in the Water Code.

COMMENT NO. 45: Jack Cathey comments that power plants along the river pump out a lot of water and the water is hot as it comes into the river. Mr. Cathey states that this constitutes a health hazard.

RESPONSE NO. 45: These comments are factors to be considered for any application filed by a power plant but cannot be considered for this application. Also, if the commenter believes that any statutes are rules under the Commission's jurisdiction have been violated, he may file a complaint with the Commission's Region office in Waco (254-751-0335).

COMMENT NO. 46: CBWC asserts that the people in the area need to understand exactly what water rights the BRA has.

RESPONSE NO. 46: BRA has many water rights. BRA's water rights that will be considered as part of the system operation requested in the application are listed in the notice of the application that was mailed on April 22, 2005. BRA also owns additional water rights that are not included in the system operation request. According to the Commission's data base, BRA has three permits and fourteen certificates of adjudication. If CBWC would like a complete list of these permits, or would like to examine these permits, it may obtain copies of these permits from the TCEQ Central File Room, TCEQ, Building E, 12100 Park 35 Circle, Austin, Texas.

COMMENT NO. 47: Lawrence Wilson comments that the riverbed at his ranch contains footprints of dinosaurs, and that low water levels can lead to the deterioration and loss of these artifacts.

RESPONSE NO. 47: To the extent that it bears on environmental protection or public welfare, this impact may be considered by staff its consideration of whether the application is detrimental to the public welfare.

COMMENT NO. 48: Lawrence Wilson, Nancy Stackhouse Wilson, and FAR state that the application will cause continued damage to their riverfront properties, such as the loss of mature pecan trees due to increased low flows.

RESPONSE NO. 48: The Executive Director's staff cannot consider the economic impact of an application on property values in his review. However, his staff can and will consider impact to riparian habitat in its environmental review.

Respectfully Submitted,

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Representing the Executive Director of the Texas Commission on Environmental Quality

CERTIFICATE OF SERVICE

I certify that on May 4, 2006, the "Executive Director's Response to Public Comments" for Permit No. 5851 was filed with the Texas Commission on Environmental Quality's Office of the Chief Clerk.

David Klein, Attorney
Environmental Law Division
Texas Commission on Environmental Quality

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