

# BRAZOS G

## WATER PLANNING GROUP

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### COUNTIES

Bell  
Bosque  
Brazos  
Burleson  
Callahan  
Comanche  
Coryell  
Eastland  
Erath  
Falls  
Fisher  
Grimes  
Hamilton  
Haskell  
Hill  
Hood  
Johnson  
Jones  
Kent  
Knox  
Lampasas  
Lee  
Limestone  
McLennan  
Milam  
Nolan  
Palo Pinto  
Robertson  
Shackelford  
Somervell  
Stephens  
Stonewall  
Taylor  
Throckmorton  
Washington  
Williamson  
Young

BRAZOS RIVER AUTHORITY, Administrative Agent  
P.O. Box 7555 v Waco, Texas 76714-7555  
(254) 761-3100 v Fax (254) 761-3204

March 11, 2009

Mr. Kevin Ward  
Executive Administrator  
Texas Water Development Board  
P.O. Box 13231  
1700 North Congress Avenue  
Austin, TX 78711-3231

**RE:** Amendment to the 2006 Brazos G Regional Water Plan related to the City of Granbury Surface Water Treatment Plan

Dear Mr. Ward:

The Brazos G Regional Water Planning Group (Group) requests that the Texas Water Development Board consider a proposed amendment to the 2006 Brazos G Regional Water Plan (2006 Plan) related to the City of Granbury Surface Water Treatment Plant. The Group met in a regularly-posted public meeting on February 18, 2009, and directed HDR to forward the amendment materials to you for concurrence that this amendment can be considered "minor."

The Group and the applicant, the City of Granbury, believe this proposed amendment qualifies as a "minor" amendment to the 2006 Plan based on the criteria set-forth in Texas Administrative Code Rule 357.16:

- It does not result in over allocation of an existing or planned source of water. The amendment does not change the allocation of any source of supply.
- It does not relate to a new reservoir. The amendment only relates to the development of treatment and transmission facilities.
- It does not have a significant impact on instream flows, environmental flows, or freshwater flows to bays and estuaries.
- It does not have a significant impact on water planning or previously adopted management strategies.
- It does not delete or change any legal requirements of the plan.

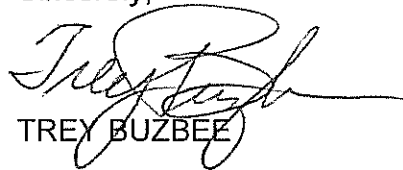
Page 2 of 2  
Addressee  
Date

The proposed amendment materials are enclosed for your review.

The Brazos G Group plans to formally consider this amendment at its next meeting, scheduled for April 13, 2009. Please notify us of your decision prior to this date so that the Group can act on the matter accordingly.

Should you have any questions regarding this amendment, please contact me at (254) 761-3168 or via e-mail at [tbuzbee@brazos.org](mailto:tbuzbee@brazos.org). We appreciate your consideration of this request.

Sincerely,



TREY BUZBEE

Enc

# BRAZOS G

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BRAZOS RIVER AUTHORITY, Administrative Agent  
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April 15, 2009

To: Interested Parties

Re: Amendment to the 2006 Brazos G Regional Water Plan related to the City of Granbury Surface Water Treatment Plant

The Brazos G Regional Water Planning Group hereby amends the 2006 Brazos G Regional Water Plan as follows:

- 1. Recommend the City of Granbury Surface Water Treatment Plant as a Recommended Water Management Strategy for the City of Granbury.**  
The City of Granbury is replacing its existing treatment plant to improve treatment capability and increase treatment capacity.

The revised plan for the City of Granbury (Section 4C.16.2) is shown in Attachment A. A detailed technical evaluation of this amendment is included in Attachment B.

## **Request for Amendment to the 2006 Brazos G Regional Water Plan to Add Development of the City of Granbury Surface Water Treatment Plant**

### **1. Background**

The *2006 Brazos G Regional Water Plan* does not include specific water management strategies or water supply plans for the City of Granbury as the City is not expected to have a water shortage. The City is predicted to have a surplus of 4,888 acre-feet per year in 2030 and 3,252 acre-feet per year in 2060. However the City's existing water treatment plant is over 30 years old and cannot treat enough water requiring the City to purchase treated water from the Brazos River Authority Surface Water and Treatment System (SWATS) plant. The City wishes to build a new water treatment plant which will provide improved treatment capability as well as increased treatment capacity. This new water treatment plant will allow the City to meet all of the customer demands without purchasing water from other providers.

Because the City of Granbury's new surface water treatment plant is not specifically included in the *2006 Brazos G Regional Water Plan* the project is not currently eligible for Water Infrastructure funding. Alva Cox, director of public works of the City of Granbury, wrote to Scott Mack, Chair of the Brazos G Regional Water Planning Group, requesting an amendment to the *2006 Brazos G Regional Water Plan* to add the development of the City of Granbury Surface Water Treatment Plant.

### **2. Amendment Request**

The City of Granbury requests that the *2006 Brazos G Regional Water Plan* be amended to add the proposed City of Granbury Surface Water Treatment Plant, which includes:

- Development of a 1.5 MGD Micro-Filtration and Reverse Osmosis water treatment plant and raw water intake and later expansion.
- Development of a 500,000 gallon ground storage tank at the plant site.
- Future expansions to the plant up to 7.5 MGD.

The City believes that this amendment meets the Texas Water Development Board criteria for a minor amendment to the *2006 Brazos G Regional Water Plan*, as laid out in Texas Administrative Code Rule 357.16:

- It does not result in over allocation of an existing or planned source of water. The amendment does not change the allocation of any source of supply.
- It does not relate to a new reservoir. The amendment only relates to the development of treatment facilities.
- It does not have a significant impact on instream flows, environmental flows, or freshwater flows to bays and estuaries.
- It does not have a significant impact on water planning or previously adopted management strategies.
- It does not delete or change any legal requirements of the plan.

If the Brazos G Regional Water Planning Group or the Texas Water Development Board determines that the requested amendment cannot be processed as a minor amendment, the City requests that it be processed as a major amendment.

### **3. Description of Strategy**

The City of Granbury currently obtains its water supply from groundwater in the Trinity Aquifer as well as surface water from Lake Granbury. Groundwater is supplied by wells in the Trinity Aquifer. Surface water is supplied from the water rights in Lake Granbury through treatment of water at the City's 0.5 MGD water treatment plant. Additional supply comes from purchase of finished water from the BRA SWATS plant. As the City's WTP was constructed over 30 years ago, it has become dilapidated and the City intends to demolish the existing 0.5 MGD plant and construct a new 1.5 MGD WTP, which will be expandable to 7.5 MGD in the future. The City will utilize the new treatment plant to provide base-load (average day) supplies, and will gradually phase out of its capacity in the SWATS plant. Peak-day supplies will be provided by SWATS capacity until phased out and existing groundwater wells.

### **4. Available Supply**

The City of Granbury has contracted with the BRA for 10,800 acre-feet per year from Lake Granbury, of which approximately 1,904 acre-feet per year is currently treated at the BRA SWATS plant. The proposed City of Granbury Surface Water Treatment Plant, which is the subject of this amendment, will initially treat 1.5 MGD and be expandable to 7.5 MGD of potable water. Once the plant is constructed the city will begin to gradually decrease supplies

treated at the SWATS plant. Water supply for the new plant will come from the city's contracted amount of 10,800 acre-feet per year from Lake Granbury.

## 5. **Environmental**

Environmental impacts could include:

- Possible minor impacts on riparian corridors.

The minor impacts during construction of the raw water intake will be minimized to the extent possible by implementing an effective SWPPP and proper revegetation of the area after construction. A summary of environmental issues is presented in Table 1.

**Table 1**  
**Environmental Issues:**  
**City of Granbury Water Supply Project**

Water Management Option	City of Granbury Surface Water Treatment Plant
Implementation Measures	Construction of a 1.5 mgd water treatment plant, pump station, and ground storage tank.
Environmental Water Needs/Instream Flows	Negligible impact.
Bays and Estuaries	Negligible impact.
Fish and Wildlife Habitat	Possible minor impacts on riparian corridors, during construction of the raw water intake.
Cultural Resources	Possible low impact.
Threatened and Endangered Species	Possible low impact.

## 6. **Engineering and Costing**

Water from Lake Granbury will be treated at the water treatment plant and distributed to the city by a system of pump stations, ground and elevated storage tanks, and pipelines. Phase 1 will include a 1.5 mgd water treatment plant and 500,000 gallon ground storage tank.

Table 2 summarizes the capital costs for Phase 1, which total \$8,944,100 using the second quarter 2002 costs to be consistent with costs shown in the *2006 Brazos G Regional Water Plan*.

**Table 2**  
**Cost Estimate Summary for**  
**City of Granbury Water Supply Project Phase 1**  
**(Second Quarter 2002 Prices and 2009 Prices)**

Item	Estimated Cost for Facilities (2002 \$)	Estimated Cost for Facilities (2009 \$)
<b>Capital Costs</b>		
New 1.5 MGD Water Treatment Plant (Including High Service Pump Station (HSPS))	\$ 8,537,550	\$ 10,500,000
500,000 Gallon Ground Storage Tank	\$ 406,550	\$ 500,000
<b>Total Capital Costs</b>	<b>\$ 8,944,100</b>	<b>\$ 11,000,000</b>
Contingencies	\$ 1,341,620	\$ 1,650,000
Engineering, Permitting, Survey, and Geotech	\$ 1,512,370	\$ 1,860,000
Interest During Construction (1 year)	\$ 473,470	\$ 565,325
<b>Total Project Costs</b>	<b>\$ 12,271,560</b>	<b>\$ 15,075,325</b>
<b>Annual Costs</b>		
Debt Service (6 percent for 30 years)	\$ 890,920	\$ 1,094,470
Operation and Maintenance (Including Plant Pumping Costs & HSPS Maintenance)	\$ 720,300	\$ 885,870
HSPS Energy Costs (653,496 kWh @ \$0.06/kWh)	\$ 39,210	\$ 52,280
<b>Total Annual Costs</b>	<b>\$ 1,650,430</b>	<b>\$ 2,032,620</b>
<b>Available Project Yield (ac-ft/yr)</b>	<b>1,680</b>	<b>1,680</b>
<b>Annual Cost of Water (\$ per ac-ft)</b>	<b>\$ 982</b>	<b>\$ 1,210</b>
<b>Annual Cost of Water (\$ per 1,000 gallons)</b>	<b>\$ 3.02</b>	<b>\$ 3.71</b>

## Notes:

- 2009 Costs were reduced to 2002 Costs using 3% Inflation per year over 7 years.
- 2009 Power Costs are based on \$0.08/kWh. 2002 costs are based on \$0.06/kWh.

Professional services, contingencies, and interest during construction will add \$3,327,460, for a total project cost of \$12,271,560. (At 2009 prices, the estimated cost is \$15,075,325.) With 6 percent interest and 30-year bonds, the annual debt service is \$890,920. Operation and maintenance costs for pumping, transmission, and treatment add \$759,510 per year, for a total annual cost of \$1,650,430 (at 2002 prices) for delivery of 1,680 acre-feet. The cost of treated water delivered is \$982 per acre-foot, or \$3.02 per thousand gallons.

Table 3 summarizes the capital costs for expansions to the plant in Phases 2 through 4. Phases 2 will total \$14,635,800 (2002 dollars). Professional services, contingencies, and interest

during construction will add \$5,132,035, for a total project cost of \$19,767,835. (At 2009 prices, the estimated cost is \$24,311,700.) With 6 percent interest and 30-year bonds, the annual debt service is \$1,435,145. Phase 3 capital costs will total \$7,317,900 (2002 dollars). Professional services, contingencies, and interest during construction will add \$2,565,985, for a total project cost of \$9,882,985. (At 2009 prices, the estimated cost is \$12,155,850.) With 6 percent interest and 30-year bonds, the annual debt service is \$717,505. Operation and maintenance costs for pumping, transmission and treatment will increase as each expansion is brought on-line. Costs for Phase 2 will add \$1,774,300 per year, and will increase up to \$2,789,120 in Phase 4. Total annual costs will be \$4,100,365 (at 2002 prices) for Phase 2 and will increase up to \$3,985,010 (at 2002 prices) for Phase 4. The Phase 2 expansion to the plant will increase the supply by 3,360 acre-feet, and Phase 4 & 5 expansion will increase the available supply by 1,680 acre-feet. The cost of treated water delivered is \$814 per acre-foot or \$2.50 per thousand gallons, \$660 per acre-foot or \$2.03 per thousand gallons, and \$474 per acre-foot or \$1.45 per thousand gallons for Phase 2, Phase 3, and Phase 4, respectively.

**Table 3**  
**Cost Estimate Summary for**  
**City of Granbury Water Supply Project Phases 2 through 5**  
**(Second Quarter 2002 Prices and 2009 Prices)**

Item	Estimated Cost for Facilities (2002 \$)	Estimated Cost for Facilities (2009 \$)
<b>PHASE 2 (4.5 MGD)</b>		
<b>Capital Costs</b>		
3 MGD Expansion to Water Treatment Plant (Including Expansion to HSPS)	\$ 14,635,800	\$ 18,000,000
<b>Total Capital Costs</b>	<b>\$ 14,635,800</b>	<b>\$ 18,000,000</b>
Contingencies	\$ 2,357,990	\$ 2,900,000
Engineering, Permitting, Survey, and Geotech	\$ 2,032,750	\$ 2,500,000
Interest During Construction (1 year)	\$ 741,295	\$ 911,700
<b>Total Project Costs</b>	<b>\$ 19,767,835</b>	<b>\$ 24,311,700</b>

Table 3 (Continued)

<b>Annual Costs</b>		
Debt Service (6 percent for 30 years)	\$ 1,435,145	\$ 1,765,030
Debt Service of Phase 1	\$ 890,920	\$ 1,094,470
Operation and Maintenance (Including Plant Pumping Costs & HSPS Maintenance)	\$ 1,656,670	\$ 2,037,475
HSPS Energy Costs (1,960,488 kWh @ \$0.06/kWh)	\$ 117,630	\$ 156,840
<b>Total Annual Costs</b>	<b>\$ 4,100,365</b>	<b>\$ 5,053,815</b>
<b>Available Project Yield (ac-ft/yr)</b>	<b>5,040</b>	<b>5,040</b>
<b>Annual Cost of Water (\$ per ac-ft)</b>	<b>\$ 814</b>	<b>\$ 1,003</b>
<b>Annual Cost of Water (\$ per 1,000 gallons)</b>	<b>\$ 2.50</b>	<b>\$ 3.08</b>
<b>PHASE 3 (6 MGD)</b>		
<b>Capital Costs</b>		
1.5 MGD Expansion to Water Treatment Plant (Including Expansion to HSPS)	\$ 7,317,900	\$ 9,000,000
<b>Total Capital Costs</b>	<b>\$ 7,317,900</b>	<b>\$ 9,000,000</b>
Contingencies	\$ 1,178,995	\$ 1,450,000
Engineering, Permitting, Survey, and Geotech	\$ 1,016,375	\$ 1,250,000
Interest During Construction (1 year)	\$ 370,615	\$ 455,850
<b>Total Project Costs</b>	<b>\$ 9,882,985</b>	<b>\$ 12,155,850</b>
<b>Annual Costs</b>		
Debt Service (6 percent for 30 years)	\$ 717,505	\$ 882,515
Debt Service of Phase 2	\$ 1,435,145	\$ 1,765,030
Operation and Maintenance (Including Plant Pumping Costs & HSPS Maintenance)	\$ 2,124,870	\$ 2,613,295
HSPS Energy Costs (2,613,984 kWh @ \$0.06/kWh)	\$ 156,840	\$ 209,120
<b>Total Annual Costs</b>	<b>\$ 4,434,360</b>	<b>\$ 5,469,960</b>
<b>Available Project Yield (ac-ft/yr)</b>	<b>6,720</b>	<b>6,720</b>
<b>Annual Cost of Water (\$ per ac-ft)</b>	<b>\$ 660</b>	<b>\$ 814</b>
<b>Annual Cost of Water (\$ per 1,000 gallons)</b>	<b>\$ 2.03</b>	<b>\$ 2.50</b>
<b>PHASE 4 (7.5 MGD)</b>		
<b>Capital Costs</b>		
1.5 MGD Expansion to Water Treatment Plant (Including Expansion to HSPS)	\$ 4,878,600	\$ 6,000,000
<b>Total Capital Costs</b>	<b>\$ 4,878,600</b>	<b>\$ 6,000,000</b>
Contingencies	\$ 780,580	\$ 960,000
Engineering, Permitting, Survey, and Geotech	\$ 683,000	\$ 840,000
Interest During Construction (1 year)	\$ 247,100	\$ 303,900
<b>Total Project Costs</b>	<b>\$ 6,589,280</b>	<b>\$ 8,103,900</b>

**Table 3 (Continued)**

<b>Annual Costs</b>			
Debt Service (6 percent for 30 years)	\$	478,385	\$ 588,345
Debt Service of Phase 3	\$	717,505	\$ 882,515
Operation and Maintenance (Including Plant Pumping Costs & HSPS Maintenance)	\$	2,593,070	\$ 3,189,120
HSPS Energy Costs (3,267,480 kWh @ \$0.06/kWh)	\$	196,050	\$ 261,400
<b>Total Annual Costs</b>	<b>\$</b>	<b>3,985,010</b>	<b>\$ 4,921,380</b>
<b>Available Project Yield (ac-ft/yr)</b>		<b>8,400</b>	<b>8,400</b>
<b>Annual Cost of Water (\$ per ac-ft)</b>	<b>\$</b>	<b>474</b>	<b>\$ 586</b>
<b>Annual Cost of Water (\$ per 1,000 gallons)</b>	<b>\$</b>	<b>1.45</b>	<b>\$ 1.80</b>

## Notes:

1. 2009 Costs were reduced to 2002 Costs using 3% Inflation per year over 7 years.
2. 2009 Power Costs are based on \$0.08/kWh. 2002 costs are based on \$0.06/kWh.

Table 4 summarizes the capital costs for the City of Granbury Water Supply Project. The construction of the new water treatment plant and expansions would supply a total of about 7.5 MGD for the City of Granbury and the total estimated capital cost will be \$48,511,660.

**Table 4**  
**Capital Cost Summary for City of Granbury Water Supply Project**  
**(Second Quarter 2002 Prices)**

<b>Project Description</b>	<b>Estimated Supply</b>	<b>Estimated Capital Costs</b>
Phase 1 - New Water Treatment Plant	1.5 MGD	\$12,271,560
Phase 2 - Water Treatment Plant Expansion	3.0 MGD	\$19,767,835
Phase 3 - Water Treatment Plant Expansion	1.5 MGD	\$9,882,985
Phase 4 - Water Treatment Plant Expansion	1.5 MGD	\$6,589,280
<b>Total</b>	<b>7.5 MGD</b>	<b>\$48,511,660</b>

## 7. Implementation Issues

The City of Granbury will encounter implementation issues including financing and Section 404 permitting. As shown in Table 5, this water management strategy has been compared to the plan development criteria.

## 8. Potential Regulatory Requirements

Implementation of this water management strategy will require the following permits for construction of the treatment plant and raw water intake:

- U.S. Army Corps of Engineers Section 404 permit for raw water intake construction.
- NPDES Stormwater Pollution Prevention Plans.
- Possibly TP&WD Sand, Shell, Gravel, and Marl permits for construction in state owned stream beds.

**Table 5**  
**Comparison of City of Granbury Water Supply Project**  
**to Plan Development Criteria**

<i>Impact category</i>	<i>Comment(s)</i>
A. Water Supply 1. Quantity 2. Reliability 3. Cost	1. Sufficient for local needs. 2. High. 3. Relatively high, but reasonable compared to other treatment plants.
B. Environmental Factors 1. Environmental Water Needs 2. Habitat 3. Cultural Resources 4. Bays and Estuaries 5. Threatened and Endangered Species 6. Wetlands	1. Low impact. 2. Low impact. 3. Low impact. 4. Low impact. 5. Low impact. 6. Low impact.
C. Impact on Other State Water Resources D. Threats to Agriculture and Natural Resources E. Equitable Comparison of Strategies Deemed Feasible F. Requirements for Interbasin Transfers G. Third Party Social and Economic Impacts from Voluntary Redistribution	No apparent negative impacts on state water resources. No effect on navigation. None. Done. Not applicable. None.

#### 4C.16.2 City of Granbury

##### 4C.16.2.1 Description of Supply

The City of Granbury obtains its water supply from groundwater from the Trinity Aquifer and from surface water from Lake Granbury. No shortages are projected for the City of Granbury. However, the City of Granbury is planning to construct a new surface water treatment plant with increased capacity to replace the aging plant currently in operation on Lake Granbury.

##### 4C.16.2.2 Water Supply Plan

Working within the planning criteria established by the Brazos G RWPG and TWDB, the following water supply plan is recommended to supplement existing supplies for the City of Granbury:

- City of Granbury Surface Water Treatment Plant – the project will treat raw water from Lake Granbury and deliver treated water to City of Granbury customers.

##### 4C.16.2.3 Costs

Costs of the Recommended Plan for the City of Granbury.

- a. City of Granbury Surface Water Treatment Plant:
  - Cost Source: Cost estimate from strategy evaluation
  - Date to be Implemented: before 2010 with future phases
  - Total Project Cost: \$48,511,660 (all phases)
  - Annual Cost: \$1,650,430 (Phase 1 Only)
  -

**Table 4C.16-2.**

**Recommended Plan Costs by Decade for City of Granbury Surface Water Treatment Plant**

<i>Plan Element</i>	<i>2010</i>	<i>2020</i>	<i>2030</i>	<i>2040</i>	<i>2050</i>	<i>2060</i>
Projected Surplus/(Shortage) (acft/yr)	5,731	5,290	4,888	4,451	3,901	3,252
<b>City of Granbury Surface Water Treatment Plant</b>						
	Phase 1	Phase 2		Phase 3	Phase 4	
Supply From Plan Element (acft/yr)	1,680	5,040	5,040	6,720	8,400	8,400
Annual Cost (\$/yr)	\$1,650,430	\$4,100,365	\$4,100,365	\$4,434,360	\$3,985,010	\$3,985,010
Unit Cost (\$/acft)	\$982	\$814	\$814	\$660	\$474	\$474