

Request for Amendment to the Region G Water Plan to Add Development of the City of Granbury Water Supply Project

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 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 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 and will gradually phase out of its capacity in the SWATS plant.

4. Available Supply

The City of Granbury has a water right for 10,800 acre-feet per year from Lake Granbury. The City also purchases approximately 1,904 acre-feet per year of treated water from 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 release their rights to

the treated water from 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 2002 costs assumed 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 \$)
Capital Costs		
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
Total Capital Costs	\$ 8,944,100	\$ 11,000,000
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
Total Project Costs	\$ 12,271,560	\$ 15,075,325
Annual Costs		
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
Total Annual Costs	\$ 1,650,430	\$ 2,032,620
Available Project Yield (ac-ft/yr)	1,680	1,680
Annual Cost of Water (\$ per ac-ft)	\$ 982	\$ 1,210
Annual Cost of Water (\$ per 1,000 gallons)	\$ 3.02	\$ 3.71

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.

Professional services, contingencies, and interest during construction will add \$3,327,460, for a total project cost of \$12,271,560. (At 2008 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 using the 2002 costs assumed in the *2006 Brazos G Regional*

Water Plan. Professional services, contingencies, and interest during construction will add \$5,132,035, for a total project cost of \$19,767,835. (At 2008 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 using the 2002 costs assumed in the *2006 Brazos G Regional Water Plan*. Professional services, contingencies, and interest during construction will add \$2,565,985, for a total project cost of \$9,882,985. (At 2008 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 available water yield by 3,360 acre-feet, and Phase 4 & 5 expansion will increase the available water yield 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 \$)
PHASE 2 (4.5 MGD)		
Capital Costs		
3 MGD Expansion to Water Treatment Plant (Including Expansion to HSPS)	\$ 14,635,800	\$ 18,000,000
Total Capital Costs	\$ 14,635,800	\$ 18,000,000
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
Total Project Costs	\$ 19,767,835	\$ 24,311,700

Table 3 (Continued)

Annual Costs		
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
Total Annual Costs	\$ 4,100,365	\$ 5,053,815
Available Project Yield (ac-ft/yr)	5,040	5,040
Annual Cost of Water (\$ per ac-ft)	\$ 814	\$ 1,003
Annual Cost of Water (\$ per 1,000 gallons)	\$ 2.50	\$ 3.08
PHASE 3 (6 MGD)		
Capital Costs		
1.5 MGD Expansion to Water Treatment Plant (Including Expansion to HSPS)	\$ 7,317,900	\$ 9,000,000
Total Capital Costs	\$ 7,317,900	\$ 9,000,000
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
Total Project Costs	\$ 9,882,985	\$ 12,155,850
Annual Costs		
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
Total Annual Costs	\$ 4,434,360	\$ 5,469,960
Available Project Yield (ac-ft/yr)	6,720	6,720
Annual Cost of Water (\$ per ac-ft)	\$ 660	\$ 814
Annual Cost of Water (\$ per 1,000 gallons)	\$ 2.03	\$ 2.50
PHASE 4 (7.5 MGD)		
Capital Costs		
1.5 MGD Expansion to Water Treatment Plant (Including Expansion to HSPS)	\$ 4,878,600	\$ 6,000,000
Total Capital Costs	\$ 4,878,600	\$ 6,000,000
Contingencies	\$ 780,580	\$ 960,000
Engineering, Permitting, Survey, and Geotech	\$ 683,000	\$ 840,000
Interest During Construction (1 year)	\$ 247,100	\$ 303,900
Total Project Costs	\$ 6,589,280	\$ 8,103,900

Table 3 (Continued)

Annual Costs		
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
Total Annual Costs	\$ 3,985,010	\$ 4,921,380
Available Project Yield (ac-ft/yr)	8,400	8,400
Annual Cost of Water (\$ per ac-ft)	\$ 474	\$ 586
Annual Cost of Water (\$ per 1,000 gallons)	\$ 1.45	\$ 1.80

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)

Project Description	Estimated Supply	Estimated Capital Costs
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
Total	7.5 MGD	\$48,511,660

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.