

**Technical Consultant
Scope of Work to Develop the
2011 Brazos G Regional Water Plan**

**Phase 2 Funding
October 2008 – December 2010**

Background

On November 16, 2005, the Brazos G Regional Water Planning Group (BGRWPG) adopted the 2006 Brazos G Regional Water Plan (2006 Plan) as part of the second Senate Bill 1 regional water planning cycle established by the 75th Texas Legislature (1997). In 2006, the Texas Water Development Board (TWDB) accepted the 2006 Plan and incorporated it into the 2007 State Water Plan. In 2007, the TWDB initiated Phase 1 of the 3rd planning cycle to develop the 2011 Brazos G Regional Water Plan (2011 Plan) by funding five special studies intended to provide information that will be used to refine elements of the 2006 Plan in preparation for development of the 2011 Plan. These studies are ongoing and are scheduled for completion by December 2008.

In the February 15, 2008, Texas Register, the TWDB requested grant applications for Phase 2 of the 2011 regional water planning cycle to develop the 2011 Plan (TRD-200800727). Phase 2 is proposed to be undertaken in 2008, 2009 and 2010, with submittal of the Initially Prepared 2011 Plan to the TWDB in early 2010. The results of the Phase 1 studies will be incorporated into the Phase 2 work to develop the 2011 Plan. As the 2011 Plan will be developed during what is considered a “mid-census” year, and updated Year 2010 Census data will not be available during the development of the 2011 Plan, this scope of work is proposed to revise and/or update the 2006 Plan as described in 31 TAC Chapter 357.

The BGRWPG proposes the following scope of work, schedule and budget for the technical consulting team¹, led by HDR Engineering, Inc. (HDR), to prepare the 2011 Brazos G Regional Water Plan. This scope of work is organized according to the ten major work tasks identified in the guidance provided by the TWDB for organizing the scope of work² and the work to be performed³. Requested funds allocated to each task for the technical consulting team are listed in Table 1. Table 1 also lists funds to be allocated to administrative expenses not related to the technical consultant team, including planning group member travel and public information expenses to be incurred by the Brazos River Authority (BRA), which serves as the administrative agent for the BGRWPG.

The BGRWPG understands that the base funding allocation for Brazos G will be \$406,210⁴ for Phase 2 of the 2011 regional water planning cycle. Approximately \$4.73 million of additional funds have been set aside for state-wide use to address additional work efforts that regional water planning groups determine to be necessary to meet the basic requirements of the TWDB regional water planning guidelines and TAC rules, as well as to provide funding for additional water supply studies and water management strategy evaluations. Funds requested by the BGRWPG are identified herein as “Base” funds, “Additional Required” funds necessary to

¹ The technical consulting team consists of HDR Engineering, Inc., Freese and Nichols, Inc., R.W. Harden and Associates, Inc., Hicks and Company, Inc., and Fletcher Communications.

² TWDB, “Guidance for Preparation of Scope of Work for Regional Water Planning,” February 5, 2008.

³ TWDB, “General Guidelines for Regional Water Plan Development,” February 19, 2008.

⁴ Combined total for Technical, Public Participation, and Facilitation Consultants.

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meet the basic requirements of the planning rules, and “Optional” funds requested for special studies to enhance the 2011 Plan. The BGRWPG is requesting \$406,210 of Base funds for technical consultant services and administrative expenses, \$355,080 of Additional Required funds necessary to complete the basic requirements of the planning rules, and \$442,100 of Optional funds that the BGRWPG feels will enhance the 2011 Plan.

Scope of Work for Technical Consultant

Task 0. Scope of Work Development

The technical consultant will advise and assist the BGRWPG in developing the scope of work for Phase 2 of the 2011 regional water planning cycle. Activities include preparation for and attendance at Scope of Work Committee meetings (a minimum of two), preparation for and attendance at BGRWPG meetings to present and discuss the scope of work, coordination with BRA, TWDB, and interested parties regarding Base, Required, and Optional elements to be included in the scope of work. Funds for Task 0. Scope of Work Development are allocated from Base Funds assigned to Task 10.

Base Funds:	\$ 10,000
Required Additional Funds:	\$ 0
Optional Funds:	\$ 0
Task 0 Subtotal:	\$ 10,000

Task 1. Planning Area Description

The current description of the planning area is considered to be complete and accurate, but will require some revision to accommodate the following changes in the Brazos G Area to reflect the most up to date information available:

1. **Update regional background data.** Update background information regarding the BGRWPG, e.g., membership, dates, etc. shown in Section 1.1. Update regional population, demographic, economic and agricultural data available from the State Data Center, Dept. of Agriculture and other sources shown in Sections 1.2, 1.5 and 1.6, and Appendices A and F;

Base Funds:	\$ 5,500
Required Additional Funds:	\$ 0
Optional Funds:	\$ 0
Task 1.2 Subtotal:	\$ 5,500

2. **Update new sources of supply.** Compile and update water supply data to include new sources of supply in the Brazos G Area, including new water rights and wholesale water supply contracts, as shown in Sections 1.3 and 1.5 and Appendix D;

Base Funds:	\$ 2,000
Required Additional Funds:	\$ 0
Optional Funds:	\$ 0
Task 1.3 Subtotal:	\$ 2,000

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3. **Update water use data.** Compile and update water use data through year 2009 for groundwater and surface water use within the Brazos G Area, as described in Sections 1.3 and 1.5 and Appendix D;

Base Funds:	\$	1,500
Required Additional Funds:	\$	0
Optional Funds:	\$	0
Task 1.4 Subtotal:	\$	1,500

4. **Develop new section describing groundwater regulation.** Develop a new report section describing regulation of groundwater in the region, including subsections describing: 1. Texas Commission on Environmental Quality (TCEQ) Priority Groundwater Management Areas in the Brazos G Area; 2. describing the activities and management plans of the 14 pending or confirmed groundwater conservation districts regulating groundwater development in the Brazos G Area; and 3. describing the HB 1763 activities in the Brazos G Area, including the status of the determination of Desired Future Conditions and Managed Available Groundwater determined by the five Groundwater Management Areas in the region (6, 7, 8, 12 and 14).

Base Funds:	\$	1,000
Required Additional Funds:	\$	6,000
Optional Funds:	\$	0
Task 1.5 Subtotal:	\$	7,000

Total Task 1 Base Funds:	\$	10,000
Total Task 1 Required Additional Funds:	\$	6,000
Total Task 1 Optional Funds:	\$	0
Total Task 1 Funds:	\$	16,000

Task 2. Select Revisions of Population and Water Demand Projections

TWDB staff, in conjunction with the TCEQ, Texas Parks and Wildlife Department (TPWD), Texas Department of Agriculture (TDA), and RWPG representatives prepared population and water demand projections for all municipal Water User Groups (WUGs) in the 2006 Plan based on demographic analysis of data from the 2000 Census and Texas Department of Health statistics. Another census will not be conducted until 2010, and, as such, population and municipal water demand projections will not be updated for all municipal WUGs during this round of regional planning. Updates are also not planned for manufacturing, mining, irrigation, and livestock WUGs.

The TWDB commissioned a study to project water needed for steam-electric power generation, and the results of this study will be used by the TWDB to revise steam-electric water demands. These new steam-electric demands will be reviewed as they are incorporated into the planning process.

While no updates are specifically planned by the TWDB for municipal WUGs, several WUGs within the Brazos G Area have experienced growth since 2000 that reflects migration rates greatly exceeding those experienced between the 1990 and 2000 Censuses. Several have reported year 2007 populations exceeding the year 2010 or 2020 projections. The BGRWPG

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will review requests from municipal WUGs to revise the current population and water demand projections, and will compile those and forward to the TWDB for review and approval. It is anticipated that, with approval from TWDB, these WUGs will have updated population and water demand projections for the 2011 Plan.

Two of the five Phase 1 studies are examining water demand projections and recommended water management strategies for Johnson County (Study No. 4) and McLennan County (Study No. 5). The BGRWPG anticipates that demand revisions arising from these studies will be considered favorably by the TWDB.

1. **Review municipal population and water demand estimates.** Disseminate population and water demand projections to all municipal WUGs for review and comment. Assist the BGRWPG with evaluating all requests for revision, compile all requests supported by the BGRWPG, and forward to the TWDB for approval. Prepare summaries of all revision requests and prepare a single revision request document to provide to the TWDB. This request will include revisions resulting from the completion of Studies No. 4 and 5 in Johnson and McLennan Counties. The following counties and metropolitan areas in the Brazos G Area have experienced growth that appears to exceed the 2006 Plan projections. It is anticipated that many WUGs within these areas will request population and water demand revisions; however, requests are not expected to be limited to these areas.
 - a. Johnson County (results from Study No. 4)
 - b. McLennan County (results from Study No 5)
 - c. Williamson County
 - d. Bell County
 - e. Fort Hood
 - f. Coryell County
 - g. Hill County
 - h. Abilene and Sweetwater area
 - i. Bryan/College Station area

Base Funds:	\$	0
Required Additional Funds:	\$	0
Optional Funds:	\$	<u>27,200</u>
Task 2.1 Subtotal:	\$	27,200

2. **Revise water demand projections for WUGs and WWPs.** Revise population and water demand projection summaries for municipal WUGs demonstrating changed conditions using new projections to be provided/approved by the TWDB. Modify water demand projection summaries for Wholesale Water Providers (WWPs) accordingly.

Base Funds:	\$	0
Required Additional Funds:	\$	0
Optional Funds:	\$	<u>6,000</u>
Task 2.2 Subtotal:	\$	6,000

3. **Include population and water demand projections for new municipal WUGs.** Include projections of population and water demands for new WUGs and water demand projections for WWPs. Update WWP contractual obligations to supply water and report along with projected demands for these new WUGs. The TWDB has identified six cities that have grown to a size sufficient to be included as WUGs, and an additional 16 non-

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city WUGs (water supply corporations and utility districts) that now serve populations sufficient to be classified as WUGs. In addition, it is anticipated that the TWDB will classify Texas A&M University as a separate WUG, as the university operates its own water supply.

Base Funds:	\$	0
Required Additional Funds:	\$	3,900
Optional Funds:	\$	0
Task 2.3 Subtotal:	\$	3,900

4. **Review new steam-electric water demand projections.** Disseminate the revised steam-electric water demands to regional entities for review and comment. Provide the demands to the approximately 15 entities supplying power to the ERCOT grid for review. Compile, review and assist the BGRWPG in developing recommended revisions to the steam-electric demands in the Brazos G Area. New generating capacity could be planned for the following locations with the Brazos G Area that need to be reflected in the revised steam-electric demand projections:

- a. Somervell County (Comanche Peak Station)
- b. Nolan County (near Sweetwater)
- c. Palo Pinto County
- d. Grimes County
- e. McLennan County

Base Funds:	\$	0
Required Additional Funds:	\$	8,160
Optional Funds:	\$	0
Task 2.4 Subtotal:	\$	8,160

5. **Update WWP contractual information.** Contact each of the approximately 23 WWPs in the Brazos G Area and obtain up-to-date contractual obligation information. Contact WUGs identified as supplying water to others and obtain up-to-date contractual information. Update summaries of contractual obligations for each WWP and WUG, and develop projected water demands for each based upon WUG projections and contractual obligations.

Base Funds:	\$	4,440
Required Additional Funds:	\$	22,760
Optional Funds:	\$	0
Task 2.5 Subtotal:	\$	27,200

6. **Summarize decadal water demand projections for all WUGs and WWPs.** Update decadal projections of water demands for all WUGs (municipal and other) and WWPs, and summarize by WUG, WWP, county, and river basin within the Brazos G Area. Coordinate projections with adjacent regions where WUGs are located in multiple regions. Complete and enter revisions of water demand projections into the TWDB Regional Water Planning Data Web Interface.

Base Funds:	\$	10,200
Required Additional Funds:	\$	3,400
Optional Funds:	\$	0
Task 2.6 Subtotal:	\$	13,600

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- 7. Compile water demand information for presentation at BGRWPG meetings.** Prepare information and present at up to three BGRWPG meetings as necessary to convey the information to the BGRWPG and obtain approval of water demands for WUGs and WWPs.

Base funds are required for preparation and attendance at one (1) BGRWPG meeting to present water demand projections. Required additional funds are for preparation and attendance at two (2) additional meetings.

Base Funds:	\$	3,120
Required Additional Funds:	\$	5,040
Optional Funds:	\$	0
Task 2.7 Subtotal:	\$	8,160

Total Task 2 Base Funds:	\$	17,760
Total Task 2 Required Additional Funds:	\$	43,260
Total Task 2 Optional Funds:	\$	33,200
Total Task 2 Funds:	\$	94,220

Task 3. Water Supply Analyses

Estimates of groundwater and surface water supplies will be updated based upon changed conditions. Changed conditions affecting groundwater supplies include updates to groundwater availability information due to new or updated Groundwater Availability Models (GAMs), timely determinations of Managed Available Groundwater from Groundwater Management Areas (GMAs), determination of a Priority Groundwater Management Area by the TCEQ, and development of new groundwater wells for water supply. Changed conditions affecting surface water supplies include updates to TCEQ Water Availability Models (WAMs), issuance of new water rights or water rights amendments, new droughts of record reducing safe or firm yields of reservoirs and minimum annual diversions available to run-of-the-river water rights, new reservoir sedimentation surveys changing the assumed storage capacities of major reservoirs, changes to wastewater effluent discharged to rivers and streams due to direct and indirect reuse, and adoption of revised strategies for management of surface water resources by owners of surface water storage and diversion facilities.

Groundwater Supplies (Tasks 3.1 – 3.4)

- 1. Update groundwater availability estimates pursuant to GMA processes.** Update estimates of groundwater availability by aquifer and county in areas for which the GMA process has provided timely estimates of Managed Available Groundwater (MAG must be provided to the BGRWPG by September 30, 2008), and in areas designated by TCEQ as Priority Groundwater Management Areas.

Base Funds:	\$	4,080
Required Additional Funds:	\$	0
Optional Funds:	\$	0
Task 3.1 Subtotal:	\$	4,080

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2. **Update groundwater availability information pursuant to revised or updated GAM information.** Advise and assist the BGRWPG in selecting and updating estimates of groundwater availability by aquifer and county in areas with updated GAM information. Advise the BGRWPG if updates to groundwater availability information is warranted using the updated GAM information. GAM information updated since development of groundwater availability estimates for the 2006 Plan include:
- a. Carrizo-Wilcox GAM
 - b. Seymour GAM
 - c. Trinity GAM
 - d. Edwards-Balcones Fault Zone GAM
 - e. Brazos River Alluvium

Required additional funds needed to evaluate updated GAM information and report recommendations to the BGRWPG. Optional funds are required to utilize GAMs to update water availability estimates for aquifers and counties covered by the five GAMs listed above.

Base Funds:	\$	0
Required Additional Funds:	\$	6,800
Optional Funds:	\$	68,000
Task 3.2 Subtotal:	\$	74,800

3. **Update groundwater supplies based on constructed well capacities.** Obtain updated lists of groundwater supply wells from the TWDB database and TCEQ database of public water suppliers. Update estimates of current groundwater supply (groundwater availability constrained by constructed well capacities) for WUGs and WWP. Contact WUGs and WWP for which groundwater supplies changed more than 10 percent from the 2006 Plan to confirm updated groundwater supply estimates.

Base Funds:	\$	13,600
Required Additional Funds:	\$	0
Optional Funds:	\$	0
Task 3.3 Subtotal:	\$	13,600

4. **Assist BGRWPG in coordinating groundwater supply estimates with local interests.** Compile groundwater availability and supply information by source, basin, county, and region to obtain estimates of groundwater supply. Prepare summaries to present to the BGRWPG. Assist the BGRWPG in coordinating groundwater supply estimates with local interests, including groundwater conservation districts, GMA process representatives, and WUGs and WWP utilizing groundwater for supply. Incorporate groundwater availability information from current Study No. 2 investigating water supplies in the Nolan County area. Compile information for up to four meetings, either BGRWPG or other meetings with local interests.

Base funds required to compile information and incorporate results from Nolan County study. Optional funds required to coordinate with interested entities, including TWDB groundwater staff, if needed.

Base Funds:	\$	4,080
Required Additional Funds:	\$	0
Optional Funds:	\$	14,300
Task 3.4 Subtotal:	\$	18,380

Surface Water Supplies (Tasks 3.5 – 3.12)

5. **Select hydrologic assumptions and operational practices to be included in the Brazos G WAM.** Provide technical support to the BGRWPG in the selection of hydrologic assumptions and operational procedures for modeling the Brazos River Basin in a manner appropriate for assessment of current surface water supply and regional water planning purposes. Assist the BGRWPG in obtaining Executive Administrator approval of such assumptions and operational procedures.

Base Funds:	\$	0
Required Additional Funds:	\$	5,440
Optional Funds:	\$	0
Task 3.5 Subtotal:	\$	5,440

6. **Update Brazos G Water Availability Model (Brazos G WAM) to reflect new water rights and revised operational practices.** Compare new water rights granted since development of the surface water availability information for the 2006 Plan to the existing Brazos G WAM, which is the water availability model used to provide estimates of surface water availability in the Brazos River Basin. Modify the Brazos G WAM to reflect these new water rights in a manner consistent with the needs of water supply planning. Update the modeling of existing water rights to reflect more current water management practices than might be reflected in the 2006 Plan. Include water rights granted or amended up through December 2008.

Base Funds:	\$	0
Required Additional Funds:	\$	15,300
Optional Funds:	\$	0
Task 3.6 Subtotal:	\$	15,300

7. **Update Brazos G WAM to reflect new estimates of reservoir sedimentation in major reservoirs.** Acquire reservoir sedimentation surveys completed by the TWDB for major reservoirs in the Brazos River Basin since 2005, and revise estimates of reservoir sedimentation for year 2000 and year 2060. Update Brazos G WAM to reflect the updated information.

Base Funds:	\$	0
Required Additional Funds:	\$	0
Optional Funds:	\$	8,160
Task 3.7 Subtotal:	\$	8,160

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8. **Update Brazos G WAM to reflect latest information concerning the BRA's System Operations Permit.** Obtain from the BRA and the TCEQ the latest information (as of December 2008) concerning the BRA's System Operations Permit and incorporate it into the Brazos G WAM, either as a water management strategy or as a current supply, as most appropriate given the status of the permit application process at the time. This is considered "Required Additional Funds" as it is a special changed condition unique to the Brazos River Basin and not reflected in any formula funding determination.

Base Funds:	\$	0
Required Additional Funds:	\$	10,200
Optional Funds:	\$	0
Task 3.8 Subtotal:	\$	10,200

9. **Apply the updated Brazos G WAM to revise estimates of water supply to water rights.** Apply the Brazos G WAM to estimate water supplies available from water rights in the Brazos River Basin. Estimate water available to run-of-the-river rights according to TWDB guidance. Estimate water available to reservoir water rights based upon firm yield or safe yield, according to the historical practices and preferences of the WUGs or WWP's receiving supply from each reservoir. Estimate supplies available to rights in Brazos G that are upstream of Possum Kingdom Reservoir according to the updated drought of record analysis pursuant to Study No. 1.

Base Funds:	\$	10,200
Required Additional Funds:	\$	0
Optional Funds:	\$	0
Task 3.9 Subtotal:	\$	10,200

10. **Compile surface water supplies to water rights and assign to WUGs and WWP's.** Compile firm yield and diversion information from the Brazos G WAM (as coordinated with adjacent regions) by Source, Water User Group, Wholesale Water Provider, county, river basin, and planning region to obtain decadal estimates of surface water supply throughout the planning period. Water supplies based on contractual agreements will be assumed to renew at the contract termination date.

Base Funds:	\$	8,160
Required Additional Funds:	\$	0
Optional Funds:	\$	0
Task 3.10 Subtotal:	\$	8,160

11. **Evaluate feasibility of alternative safe yield estimates as a planning concept to account for potential climate variability.** Safe yield concepts are utilized widely in West Texas to provide protection from the effects of a future drought that may be worse than the drought of record. Most concepts assume that a volume equivalent to a one-year supply remains in storage during the critical month of the drought of record analysis. Some entities utilize a 6-month safe yield estimate. The potential for increased climatic variability has been a recent concern; however, little can be predicted accurately that would form a solid basis for changing the hydrologic data contained in current WAMs to account for climatic variability. Any such changes would be speculative at best. An alternative approach is to revise the concept of safe yield to allow for periods longer than one year of supply remaining in storage to provide an additional level of protection. For supplies from reservoirs in the western portion of the region that are more susceptible to

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drought, and for all WUGs and WWPs solely dependent on supplies from smaller reservoirs (less than 10,000 acft capacity), calculate 2- and 3-year safe yield estimates in addition to firm and/or 1-year safe yields. At the request of local entities, utilize 2- or 3-year safe yields as a basis for supply.

Base Funds:	\$	0
Required Additional Funds:	\$	0
Optional Funds:	\$	20,400
Task 3.11 Subtotal:	\$	20,400

12. **Coordinate surface water availability analyses with adjacent regions and TWDB staff.** Provide Brazos G WAM results and model data sets to adjacent regions utilizing surface water supplies from the Brazos River Basin. Coordinate supplies to be divided between regions. Provide data sets and summaries of analyses to TWDB modeling staff. Prepare for and attend up to four meetings with representatives from adjacent regions and/or TWDB staff to coordinate surface water supply estimates.

Required Additional Funds will be used to compile and provide Brazos G WAM data sets to Regions O, C, and H, and to TWDB staff. Optional funds are required for further coordination and meetings with technical representatives from those regions and TWDB staff, and to provide Brazos G WAM data sets to other regions.

Base Funds:	\$	0
Required Additional Funds:	\$	4,080
Optional Funds:	\$	14,800
Task 3.12 Subtotal:	\$	18,880

Develop Final Estimates of Water Supply (Tasks 3.13 – 3.16)

13. **Determine infrastructure constraints to utilization of groundwater and surface water supplies.** Compile TCEQ Water System Data Reports for municipal Water User Groups and identify any physical constraints limiting use of available supplies.

Base Funds:	\$	0
Required Additional Funds:	\$	11,050
Optional Funds:	\$	0
Task 3.13 Subtotal:	\$	11,050

14. **Determine supplies available from current wastewater reuse systems.** Research and quantify existing supplies available from direct and indirect reuse of treated wastewater effluent in the Brazos G Area. Develop this information as an additional source of supply in the Brazos G Area.

Reuse of treated effluent is a growing source of supply in Brazos G and compilation of current activities is not reflected in formula funding and requires additional funds to account for this source of supply.

Base Funds:	\$	0
Required Additional Funds:	\$	7,820
Optional Funds:	\$	0
Task 3.14 Subtotal:	\$	7,820

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15. **Planning Group Updates.** Prepare information to summarize and present ongoing water supply analyses to the BGRWPG. Prepare for up to eight meetings to present water supply information to the BGRWPG, including the Groundwater and Surface Water Committees.

Base funding required to compile all water supply analyses and present at a single meeting of the BGRWPG. Optional funds are required to prepare for and present interim analyses at additional BGRWPG meetings and at Groundwater and Surface Water Committee meetings.

Base Funds:	\$	6,120
Required Additional Funds:	\$	0
Optional Funds:	\$	25,000
Task 3.15 Subtotal:	\$	31,120

16. **Update TWDB Database.** Complete and update required data elements for the TWDB Regional Water Planning Data Web Interface.

Base Funds:	\$	0
Required Additional Funds:	\$	19,550
Optional Funds:	\$	0
Task 3.16 Subtotal:	\$	19,550

Total Task 3 Base Funds:	\$	46,240
Total Task 3 Required Additional Funds:	\$	80,240
Total Task 3 Optional Funds:	\$	150,660
Total Task 3 Funds:	\$	277,140

Task 4. Identification, Evaluation and Selection of Water Management Strategies Based on Needs

Task 4 involves the quantification of projected needs for additional water supply; identification, technical evaluation, and selection of recommended and alternative water management strategies to meet projected needs; and assessment of the cumulative effects of implementation of the 2011 Plan. Technical evaluations of water management strategies in the 2011 Plan will be at the same level of detail and follow a similar pattern to evaluations completed in the 2006 Plan. For water management strategies being continued from the 2006 Plan to the 2011 Plan, only costs and developed supply (using updated Brazos G WAM and/or groundwater availability information, as appropriate), will be updated, in addition to review and revision to ensure that plan elements necessary to qualify for funding under the TWDB's Water Infrastructure Funding program are included in the 2011 Plan. No additional analysis of existing water management strategies will be completed, except as described herein.

1. **Identify potentially feasible water management strategies.** Participate in a public meeting with the BGRWPG to solicit information and identify potentially feasible water management strategies that could meet projected water needs (shortages). Document the process. Develop scopes of work and budgets for evaluation of those strategies the

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BGRWPG desires to pursue as possible recommended or alternative water management strategies. Assist the BGRWPG in applying for additional funds for the evaluations if insufficient funds are available for the evaluations.

Base funds are required to document existing process for how potentially feasible strategies were identified, mostly during the development of the 2006 Plan, and during the development of the scopes of work for Phases 1 and 2 of the 2011 Plan. Optional funds are required to prepare for and participate in an additional public meeting to solicit additional ideas, and to research and develop scopes of work and budgets for evaluating additional water management strategies, and to apply for additional funds to complete the evaluations.

Base Funds:	\$	1,020
Required Additional Funds:	\$	0
Optional Funds:	\$	7,000
Task 4.1 Subtotal:	\$	8,020

2. **Update water needs for Water User Groups and Wholesale Water Providers.** Based on updated supplies and demands (Tasks 2 and 3), update water needs (shortages) for all WUGs, and WWPs, and compile on a decadal basis. Develop summaries of needs (shortages) presented by WUG, WWP, county, river basin and region.

Base funding includes all WUGs and WWPs identified in the 2006 Plan. Required Additional Funding includes 23 additional municipal WUGs formerly aggregated in the County-Other category.

Base Funds:	\$	16,150
Required Additional Funds:	\$	2,040
Optional Funds:	\$	0
Task 4.2 Subtotal:	\$	18,190

3. **Solicit and compile information on water management strategies planned by WUGs and WWPs.** Based on updated needs, solicit information from each of the WUGs and WWPs regarding future water supply plans to meet the projected needs. Select recommended and alternative water management strategies based upon feedback received. Compile and report the information to the BGRWPG.

Optional funds are assumed because direct solicitation of plans from local entities is not specified in TWDB guidance or rules.

Base Funds:	\$	0
Required Additional Funds:	\$	0
Optional Funds:	\$	13,600
Task 4.3 Subtotal:	\$	13,600

4. **Update information concerning existing recommended and alternative water management strategies evaluated in the 2006 Plan.** For each water management strategy selected as a recommended or alternative strategy, for which a full evaluation was performed for the 2006 Plan, update costs and supplies developed, and other information that may change as a result of new WAM or GAM information. Review each water management strategy for each municipal WUG and WWP to identify project

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elements that may not be included in the evaluation performed in 2006, e.g., specific mention and costing of intakes, treatment plants, pipelines and pump stations that may be eligible for TWDB Water Infrastructure Fund participation. Add those elements to the evaluations. For strategies involving purchase of new or additional water supplies from existing sources, develop a separate report section in Volume II of the Plan describing pipeline, pump station, treatment and other miscellaneous infrastructure capital costs necessary to physically deliver the water supplies. There are approximately 40 cases in the 2006 Plan where capital costs for specific infrastructure elements were not included.

Base funds are required to update supplies and costs for approximately 61 strategies identified in the 2006 Plan. Some additional infrastructure elements may also need to be identified and cost estimates updated. Required Additional Funds are needed to identify and cost specific infrastructure elements not called out in the existing plan for approximately 40 WUGs and WWPs, where the 2006 Plan identifies only an estimated annual cost for treated water and does not identify specific capital cost elements. Required Additional Funds will also be used to develop an additional report section in Volume II summarizing the capital cost elements for the individual strategies.

Base Funds:	\$ 41,480
Required Additional Funds:	\$ 74,800
Optional Funds:	\$ 0
Task 4.4 Subtotal:	\$ 116,280

5. **Update additional water management strategies.** The following potential water management strategies have been identified since the completion of the 2006 Plan, or are mentioned as alternative strategies in the 2006 Plan without having full evaluations completed:

- a. **Coryell County Reservoir.** The Department of the Army has been expanding operations on Fort Hood, which traditionally has impacted the Bell County area. However, the facility extends into Coryell County and significant growth is expected in the vicinity of Fort Hood in Coryell County as the base expands operations in that sector. Current water supplies in Coryell are limited, as recently stated by the TCEQ, which has recommended that Coryell County be included in a Priority Groundwater Management Area: "...the delivery of alternative surface supplies is not projected to be economically feasible." The Court has requested that Brazos G evaluate a new water supply reservoir that at one time was recommended by the US Army Corps of Engineers on Cowhouse Creek in either Coryell or Hamilton Counties. This task would perform a full water management strategy evaluation of the propose reservoir as a potential source of supply to meet needs in the Coryell County area.

Required Additional Funds are needed to evaluate this water management strategy to meet the needs that are anticipated to be identified in the 2011 Plan for Coryell County entities.

Base Funds:	\$ 0
Required Additional Funds:	\$ 40,800
Optional Funds:	\$ 0
Task 4.5.a Subtotal:	\$ 40,800

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b. **Stonewall, Garza and Kent County Chloride Control Project.** 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 an 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. It is a water management strategy recommended for the Brazos River Authority in both the 2001 and 2006 Plans. The tasks will be completed for the water management strategy evaluation:

- i. Identify and quantify current sources of elevated chlorides in the Brazos River.
- ii. Prepare a basin-wide salinity mass balance using recently-implemented features in WRAP to model salinity under the Brazos G assumptions and implementation of the recommended water plan. Estimate and include the effects of brine disposal from existing desalination facilities. If feasible, estimate and include the effects of secondary recovery by oilfields, such as has been attributed to salt seeps observed in Hubbard Creek Reservoir.
- iii. Summarize and characterize the effects of salinity on water supplies for municipal, irrigation, and some industrial uses in the Brazos River Basin.
- iv. Evaluate the upper basin chloride control project, based on the project's projected salinity removal rates, and determine its overall impacts using the salinity balance feature in WRAP.
- v. Complete environmental evaluation of the project, including consideration of the impacts of chloride reduction on endangered/threatened species dependant on saline surface water.

Base Funds:	\$	0
Required Additional Funds:	\$	0
Optional Funds:	\$	<u>73,900</u>
Task 4.5.b Subtotal:	\$	73,900

c. **Reallocation of storage in Federal Reservoirs.** The BRA and the US Army Corps of Engineers are engaged in a study to investigate the feasibility of reallocating a portion of flood storage to water supply in certain Federal reservoirs. This task will coordinate with the BRA and the Corps and incorporate the results of that study into a water management strategy evaluation.

Base Funds:	\$	0
Required Additional Funds:	\$	0
Optional Funds:	\$	<u>13,850</u>
Task 4.5.c Subtotal:	\$	13,850

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- d. **Update Lake Granger Conjunctive Use Project.** The BRA is implementing the Lake Granger Conjunctive Use project, and has decided that co-mingling of groundwater and surface water is not the preferred configuration for the project. This task will update the strategy (supplies developed, costs and infrastructure) to match the BRA's preferred configuration.

Base Funds:	\$	0
Required Additional Funds:	\$	0
Optional Funds:	\$	<u>10,200</u>
Task 4.5.d Subtotal:	\$	10,200

- e. **BRA Main-Stem Supplies to tributary areas.** Much of the growth in water demands in Brazos G is occurring in tributary areas, away from the main stem of the Brazos River. This task will evaluate up to five projects to supply water needs in tributary areas with BRA System supply piped from the main stem of the Brazos River. Potential areas could include Comanche, Limestone and Johnson Counties.

Base Funds:	\$	0
Required Additional Funds:	\$	0
Optional Funds:	\$	<u>51,000</u>
Task 4.5.e Subtotal:	\$	51,000

- f. **Update Advanced Conservation Strategies.** Utilize the existing strategy information developed for the 2006 Plan to update the supplies developed from advanced conservation to match updated water demands and needs. Utilize the updated results as water management strategies for municipal WUGs.

Base Funds:	\$	0
Required Additional Funds:	\$	13,600
Optional Funds:	\$	<u>0</u>
Task 4.5.f Subtotal:	\$	13,600

- g. **Update Brushy Creek Reservoir Evaluation.** Brushy Creek Reservoir is identified as a recommended water management strategy for the City of Marlin. A full evaluation was performed for the 2001 Plan, but not the 2006 Plan. Implementation of the project has been continuing. This task would update information based on the most current level of development of the project, and complete a full water management strategy evaluation of the propose reservoir.

Base Funds:	\$	0
Required Additional Funds:	\$	0
Optional Funds:	\$	<u>17,000</u>
Task 4.5.g Subtotal:	\$	17,000

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- h. **Abilene Water Supply from Possum Kingdom Reservoir.** Coordinate with the BRA and the City of Abilene to obtain current costs and configurations for this project, which is listed as an alternative strategy but was not evaluated fully in the 2006 Plan.

Base Funds:	\$	0
Required Additional Funds:	\$	0
Optional Funds:	\$	<u>6,800</u>
Task 4.5.h Subtotal:	\$	6,800

6. **Evaluate additional water management strategies that are identified as potentially feasible in Task 4.1.** Assume that five such strategies have not yet been identified, but that will require full evaluation for consideration as recommended or alternative water management strategies due to changed conditions for WUGs or WWP.

Base Funds:	\$	0
Required Additional Funds:	\$	0
Optional Funds:	\$	<u>38,250</u>
Task 4.6 Subtotal:	\$	38,250

7. **Compile and include water management strategies arising from Phase 1 studies.** The Phase 1 studies are evaluating water management strategies in the Nolan, Johnson, and McLennan county areas, as well as identifying two potential regional partnerships of small systems. Compile and include the information from these studies into the 2006 Plan, as needed.

Base Funds:	\$	0
Required Additional Funds:	\$	20,400
Optional Funds:	\$	<u>0</u>
Task 4.7 Subtotal:	\$	20,400

8. **Identify and Evaluate Water Management Strategies for New WUGs with Needs.** The 2011 Plan will identify an additional 23 WUGs that were formerly aggregated in the County-Other category. This task will identify and recommend water management strategies for these WUGs that have needs. The budget assumes that fifteen (15) of these new WUGs will have needs and require identification and selection of water management strategies.

Required Additional Funds are needed, as the formula funding does not take into account the new WUGs identified as potentially having needs.

Base Funds:	\$	0
Required Additional Funds:	\$	40,800
Optional Funds:	\$	<u>0</u>
Task 4.8 Subtotal:	\$	40,800

9. **Summarize and present results to BGRWPG.** Summarize and present the results of water needs assessments and water management strategy evaluations at meetings of the BGRWPG, and provide technical support as the BGRWPG selects recommended and alternative strategies to meet needs.

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Required additional funds will be used for preparation and participation in three (3) meetings of the BGRWPG to 1. Present needs assessments; 2. Present evaluations of water management strategies; and 3. Select appropriate water management strategies to meet projected needs. Optional Funds are required to provide preparation and participation in up to 3 additional BGRWPG meetings.

Base Funds:	\$	0
Required Additional Funds:	\$	12,740
Optional Funds:	\$	<u>12,740</u>
Task 4.9 Subtotal:	\$	25,480

10. Revise and/or update water supply plans for each WUG and WWP.

Base funding required for existing WUGs identified in the 2006 Plan. Required Additional Funds are required for new WUGs (and possibly WWPs) not included in the 2006 Plan.

Base Funds:	\$	20,400
Required Additional Funds:	\$	10,200
Optional Funds:	\$	<u>0</u>
Task 4.10 Subtotal:	\$	30,600

11. Socio-economic Impacts of not Meeting Needs. Using technical information provided by the TWDB, update and summarize the potential social and economic effects of not meeting the projected water needs.

Base Funds:	\$	4,080
Required Additional Funds:	\$	0
Optional Funds:	\$	<u>0</u>
Task 4.11 Subtotal:	\$	4,080

12. Determine Baselines to Assess Plan's Effects. Provide technical support to the BGRWPG in the selection of appropriate baselines for the assessment of cumulative effects of implementation of the 2011 Plan on surface water and groundwater.

Baselines were already selected during the 2006 Plan. Modifications of that selection is an optional task.

Base Funds:	\$	0
Required Additional Funds:	\$	0
Optional Funds:	\$	<u>5,740</u>
Task 4.12 Subtotal:	\$	5,740

13. TWDB Database Update. Complete and update required data elements in the TWDB Regional Water Planning Data Web Interface regarding needs and recommended water management strategies.

Base Funds:	\$	17,000
Required Additional Funds:	\$	10,200
Optional Funds:	\$	<u>0</u>
Task 4.12 Subtotal:	\$	27,200

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Total Task 4 Base Funds:	\$ 100,130
Total Task 4 Required Additional Funds:	\$ 225,580
Total Task 4 Optional Funds:	\$ 250,080
Total Task 4 Funds:	\$ 575,790

Task 5. Impacts of Selected Water Management Strategies on Key Parameters of Water Quality and Impacts of Moving Water from Rural and Agricultural Areas.

1. **Impacts on Key Parameters of Water Quality.** Provide technical assistance to the BGRWPG to update the list of key water quality parameters identified in the 2006 Plan. Describe the potential effects of implementation of the 2011 RWP on selected key parameters of water quality in the 2006 RWP, in response to changed conditions and new recommended water management strategies.

Base Funds:	\$ 5,440
Required Additional Funds:	\$ 0
Optional Funds:	\$ 4,080
Task 5.1 Subtotal:	\$ 9,520

2. **Impacts of Moving Water from Rural and Agricultural Areas.** None of the strategies in the 2006 Plan involved transferring water from agricultural users. Review new recommended strategies in the 2011 Plan and reassess this determination. Utilize optional funds to address this issue if it arises for the 2011 Plan.

Base Funds:	\$ 2,040
Required Additional Funds:	\$ 0
Optional Funds:	\$ 4,080
Task 5.2 Subtotal:	\$ 6,120

Total Task 5 Base Funds:	\$ 7,480
Total Task 5 Required Additional Funds:	\$ 0
Total Task 5 Optional Funds:	\$ 8,160
Total Task 5 Funds:	\$ 15,640

Task 6. Water Conservation and Drought Management Recommendations.

1. **Water Conservation and Drought Management Recommendations.** Update the summary of water conservation and drought management recommendations in the 2006 RWP for inclusion in the 2011 RWP.

Base Funds:	\$ 7,000
Required Additional Funds:	\$ 0
Optional Funds:	\$ 0
Task 6.1 Subtotal:	\$ 7,000

2. **Water Conservation and Drought Contingency Plans.** Solicit example water conservation and drought contingency plans for inclusion as an appendix in the 2011 Plan report. Obtain and select one plan of each and prepare appendix.

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Base Funds:	\$ 3,000
Required Additional Funds:	\$ 0
Optional Funds:	\$ 0
Task 6.2 Subtotal:	\$ 3,000

Total Task 6 Base Funds:	\$ 10,000
Total Task 6 Required Additional Funds:	\$ 0
Total Task 6 Optional Funds:	\$ 0
Total Task 6 Funds:	\$ 10,000

Task 7. Description of How the Regional Water Plan is Consistent with Long-term Protection of the State’s Water, Agricultural, and Natural Resources.

Assess Plan’s Effects. Apply surface water availability models (WAMs and GAMs) to simulate hydrologic conditions representative of full implementation of the 2011 Plan. Illustrate expected changes in streamflows. Prepare and present summaries to the BGRWPG. Document analysis within the context of the 2006 Plan with comparisons to the 2006 Plan’s effects

Total Task 7 Base Funds:	\$ 10,000
Total Task 7 Required Additional Funds:	\$ 0
Total Task 7 Optional Funds:	\$ 0
Total Task 7 Funds:	\$ 10,000

Task 8. Recommendations Regarding Unique Stream Segments and/or Reservoir Sites and Legislative & Regional Policy Issues.

1. **Recommendations regarding policy issues.** Assist the BGRWPG with consideration of regional policy issues and development of recommendations for legislative, administrative, and regulatory rule changes.

Base Funds:	\$ 12,000
Required Additional Funds:	\$ 0
Optional Funds:	\$ 0
Task 8.1 Subtotal:	\$ 12,000

2. **Designation of unique stream segments and reservoir sites.** Assist the BGRWPG with selecting and documenting any unique stream segments and/or unique reservoir sites ultimately adopted for inclusion in the 2011 Plan.

Base Funds:	\$ 3,000
Required Additional Funds:	\$ 0
Optional Funds:	\$ 0
Task 8.2 Subtotal:	\$ 3,000

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Total Task 8 Base Funds:	\$ 15,000
Total Task 8 Required Additional Funds:	\$ 0
Total Task 8 Optional Funds:	\$ 0
Total Task 8 Funds:	\$ 15,000

Task 9. Report to Legislature on Water Infrastructure Funding Recommendations.

Perform survey and develop funding recommendations. Assist the BGRWPG in the performance of an infrastructure funding survey based on the Water Management Strategies included in the 2011 Plan, follow-up on responses, summarize the responses, and document in accordance with TWDB guidance. Assist the BGRWPG with the development of recommendations regarding the proposed role of the State in financing projects identified in the 2011 Plan.

Total Task 9 Base Funds:	\$ 25,800
Total Task 9 Required Additional Funds:	\$ 0
Total Task 9 Optional Funds:	\$ 0
Total Task 9 Funds:	\$ 25,800

Task 10. Plan Adoption and Related Items.

1. **Website maintenance.** Maintain the Brazos G Regional Water Planning Group website (brazosgwater.org). Assist with posting and formatting information on the website.

Base Funds:	\$ 6,500
Required Additional Funds:	\$ 0
Optional Funds:	\$ 0
Task 10.1 Subtotal:	\$ 6,500

2. **Draft Initially Prepared 2011 Plan (IPP).** Assemble a Draft Initially Prepared 2011 Plan in early 2010 for review and comment by the public and regional interests.

Base Funds:	\$ 41,500
Required Additional Funds:	\$ 0
Optional Funds:	\$ 0
Task 10.2 Subtotal:	\$ 41,500

3. **Present Draft IPP at Subregional Meetings.** Prior to formal adoption of the IPP by the BGRWPG, prepare summaries and present the Draft IPP at three subregional meetings, located in the Upper, Middle and Lower portions of the Brazos G Area. Obtain input from the public and interested parties and assist the BGRWPG in revising the IPP as necessary to reflect the comments received.

Base Funds:	\$ 0
Required Additional Funds:	\$ 0
Optional Funds:	\$ 12,380
Task 10.3 Subtotal:	\$ 12,380

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4. **Resolve internal and inter-regional conflicts.** Assist the BGRWPG and TWDB in inter-regional cooperation efforts, timely resolution of any internal or inter-regional conflicts, and/or resolution of conflicts regarding water management strategies or groundwater availability estimates for the IPP.

Base Funds:	\$	6,800
Required Additional Funds:	\$	0
Optional Funds:	\$	0
Task 10.4 Subtotal:	\$	6,800

5. **Finalize TWDB database entry.** Complete and update required data elements in the TWDB Regional Water Planning Data Web Interface. Resolve database conflicts with adjacent regions sharing water supply sources, WUGs and WWPs.

Base Funds:	\$	10,200
Required Additional Funds:	\$	0
Optional Funds:	\$	0
Task 10.5 Subtotal:	\$	10,200

6. **Finalize IPP and submit to TWDB.** Pursuant to TWDB rules and guidance, assemble and complete the Initially Prepared 2011 Plan in early 2010 for review and comment by the public, TWDB, and other local, regional, State, and Federal interests

Base Funds:	\$	22,300
Required Additional Funds:	\$	0
Optional Funds:	\$	0
Task 10.6 Subtotal:	\$	22,300

7. **Finalize 2011 Plan.** Coordinate revision of the IPP in response to review comments received from the TWDB, resource agencies, water purveyors, interested organizations, and the public. Finalize the 2011 Plan for adoption by the BGRWPG and approval by the TWDB.

Base Funds:	\$	27,900
Required Additional Funds:	\$	0
Optional Funds:	\$	0
Task 10.7 Subtotal:	\$	27,900

Total Task 10 Base Funds (Excluding Scope of Work):	\$	115,200
Total Task 10 Required Additional Funds:	\$	0
Total Task 10 Optional Funds:	\$	0
Total Task 10 Funds (Excluding Scope of Work):	\$	115,200

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Table 1

Technical Consultant Task Budget

Task No.	Task Name / Report Section	Base Funding Allocation	Technical Consultant Fee	Base Funding	Additional Required	Optional
Task 0	Scope of Work Development	\$ 10,000	\$ 10,000	\$ 10,000	\$ -	\$ -
Task 1	Planning Area Description	\$ 10,000	\$ 16,000	\$ 10,000	\$ 6,000	\$ -
Task 2	Population and Water Demand Projections	\$ 171,610	\$ 94,220	\$ 17,760	\$ 43,260	\$ 33,200
Task 3	Water Supply Analyses		\$ 277,140	\$ 46,240	\$ 80,240	\$ 150,660
Task 4	Identification, Evaluation, and Selection of Water Management Strategies		\$ 575,790	\$ 100,130	\$ 225,580	\$ 250,080
Task 5	Impacts of Selected Water Management Strategies on Key Parameters of Water Quality and Impacts of Moving Water from Rural and Agricultural Areas		\$ 15,640	\$ 7,480	\$ -	\$ 8,160
Task 6	Water Conservation and Drought Management Recommendations		\$ 10,000	\$ 10,000	\$ 10,000	\$ -
Task 7	Description of How the Regional Water Plan is Consistent with Long-term Protection of the State's Water, Agricultural, and Natural Resources	\$ 10,000	\$ 10,000	\$ 10,000	\$ -	\$ -
Task 8	Recommendations Regarding Unique Stream Segments and/or Reservoir Sites and Legislative & Regional Policy Issues	\$ 15,000	\$ 15,000	\$ 15,000	\$ -	\$ -
Task 9	Report to Legislature on Water Infrastructure Funding Recommendations	\$ 25,800	\$ 25,800	\$ 25,800	\$ -	\$ -
Task 10	Plan Adoption and Other Items	\$ 163,800	\$ 115,200	\$ 115,200	\$ -	\$ -
Grand Total - Technical Consultant		\$ 406,210	\$ 1,164,790	\$ 367,610	\$ 355,080	\$ 442,100