

Status Report
Lake Granbury Watershed Protection Plan
As of Aug. 3, 2010

Water Quality Concern: High levels of bacteria found in certain coves of the lake.

Contractor: Brazos River Authority (BRA); BRA will serve as the Watershed Coordinator (November 21, 2005 – August 31, 2009)

Funding: Federal Share (\$874,884) + Local Match (\$583,256) = Total Contract (**\$1,458,140**)

Project Support: Senator Kip Averitt supported stakeholders by requesting a project through TCEQ's Clean Water Act Section 319 grant that would bring everyone together to arrive at a consensus plan to address water quality concerns. Congressman Chet Edwards supported the TCEQ project and garnered funding from the U.S. Dept. of Energy that the Texas Water Resource Institute would use to conduct golden algae research and public outreach for the watershed protection plan. TCEQ Commissioner Larry Soward showed his support for the project by making a presentation at the kick-off meeting stating TCEQ's commitment to a successful project.

Project Objectives:

1. Develop a locally driven Watershed Protection Plan (WPP) in accordance with EPA 319(h) Nonpoint Source grant guidelines, which coordinates with other on-going activities;
2. Empower local stakeholders to identify the sources affecting water quality, and design and implement strategies to address the Lake's water quality concerns;
3. Define the expected water quality improvements to be achieved by the implementation strategies; and
4. Begin to address "known pollution sources" by implementing best management practices during the WPP process and partnering with other local activities.

Stakeholder Involvement: Over 70 representatives from local governments, associations, businesses, and land owners have participated in a series of stakeholder meetings. The meetings have been well-attended with good discussions among technical staff and stakeholders. Each significant step taken with the plan is presented to the stakeholders for their input, and the 23-member steering committee votes for or against each initiative. This process has worked well to ensure a variety of representation and a commitment to the individual project objectives. The stakeholders are well-informed on the status of activities and understand that some questions will take time to answer.

Meeting With Key Stakeholders (Dec. 2, 2005): Congressman Chet Edwards, Senator Averitt and Representative Keffer hosted a meeting with key Lake Granbury Stakeholders. **Objective of meeting:** Seek key stakeholders' support for the project. Stakeholders granted their support.

First Kick-Off Lake Granbury WPP Stakeholder Meeting (Feb. 9, 2006): Congressman Chet Edwards, Senator Averitt and Representative Keffer hosted the meeting in the City of Granbury at the City Council Chambers. Commissioner Soward made a presentation at the meeting granting his support for the project.

Objectives of Feb 9, 2006 meeting:

- Inform the stakeholders of the project work plan
- Educate everyone of the stakeholder process
- Garner support for the project and coordinate our efforts with other activities in the watershed
- Review the stakeholder bylaws
- Identify any missing stakeholders, so they can be invited to future meetings

- Agree to another meeting in March, 2006

Next Steps:

- Host another stakeholder meeting in March, 2006
- Review all data with stakeholders; stakeholders make decisions on additional project monitoring
- Stakeholders adopt their bylaws
- BRA issues RFP for project modeling
- BRA develops quality assurance project plan
- BRA develops a web-page that tracks project development and meeting minutes

Second Stakeholder Meeting (Mar. 24, 2006): Congressman Chet Edwards, Senator Averitt, and staff from Representative Keffer's office hosted the meeting in Granbury at the American Legion Hall.

Objectives of March 24, 2006 meeting:

- Discuss and vote on by-laws
- Outline stakeholder involvement process
- Discuss and decide on needs for representation on the steering committee
- Provide an overview of water quality assessment and monitoring sites
- Inform and obtain input from stakeholders on future work to conduct land-use survey, potential for bacteria source tracking, and Texas Water Resources Institute work in the lake.

Next Steps:

- Hold a vote via email to nominate additional members
- Investigate potential locations for bacteria source tracking and present at next meeting for stakeholder review
- Prepare land-use and soils maps for use in modeling exercise; bring to next meeting for stakeholder review and input
- Select contractor for modeling work; present overview of expected modeling activities to stakeholder workgroup
- Prepare suggested monitoring updates and changes for stakeholder review and input

Third Stakeholder Meeting (May 10, 2006): Staff from the Brazos River Authority and the Texas Commission on Environmental Quality held the meeting in Granbury at the City Council Chambers.

Objectives of May 10, 2006 meeting:

- Review history of water quality information for the lake
- Inform stakeholders about the State's water quality assessment process
- Present modeling overview and inform stakeholders about model assumptions
- Decide on monitoring plan for the project
- Provide an update on wastewater treatment plant operations and water quality surveys
- Present land-use analysis

Next Steps:

- Secure modeling contract and identify data gaps for modeling needs
- Finalize land-use analysis
- Collect information on age of neighborhoods and septic tanks
- Prepare quality assurance project plan based on monitoring plan decisions

Fourth Stakeholder Meeting (Sep. 28, 2006): Staff from the Brazos River Authority and the Texas Commission on Environmental Quality held a meeting in Granbury at the American Legion Hall.

Objectives of September 28, 2006 meeting:

- Present findings from land-use analysis and request input from stakeholders

- Present activities related to water quality modeling
- Discuss wastewater treatment plants and TCEQ Region Office findings
- Present public outreach/education plan and obtain input on next steps
- Provide information to stakeholders on future plans for the City of Granbury's wastewater treatment plant
- Review stakeholder representation and stakeholder by-laws to ensure intent is met

Next Steps:

- Continue land-use analysis to identify soil suitability for individual subdivisions
- Modelers begin data assessment, identify data gaps, and assess different models to use
- Continue talks with Texas Agriculture Experiment Station, El Paso, (TAES) regarding bacterial source tracking (BST) analysis
- Investigate maintenance records for wastewater treatment plants - TCEQ
- Investigate information on waterfowl concentrations and patterns of migration
- Report on Bacteria TMDL Task Force findings
- Review stakeholder representation and stakeholder by-laws to ensure intent is met
- Plan to host stakeholder meeting in January/February 2007

Fifth Stakeholder Meeting (Feb. 13, 2007): Staff from the Brazos River Authority and the Texas Commission on Environmental Quality held a meeting in Granbury at the City Council Chambers.

Objectives of February 13, 2007 meeting:

- Present findings data evaluation by the modeling team
- Present final land-use analysis results
- Update stakeholder's on the State's Bacteria TMDL Taskforce
- Present an update on the status of the negotiation with TAES for the BST project
- Discuss wastewater treatment plants and TCEQ Region Office findings
- Present plan for quarterly waterfowl counts and seek stakeholder approval of this plan

Next Steps:

- Modelers identify solutions to data gaps, and select models to be used
- Complete talks with TAES regarding BST analysis
- Investigate maintenance records for wastewater treatment plants - TCEQ
- Begin data collection on waterfowl concentrations on Lake Granbury
- Report on Bacteria TMDL Task Force findings

Sixth Stakeholder Meeting (May 22, 2007): Staff from the Brazos River Authority and the Texas Commission on Environmental Quality will hold a meeting in Granbury at the American Hall.

Objectives of May 22, 2007 meeting:

- Review goals of the WPP
- Present modelers recommendation for water quality models and additional data needs
- Stakeholders determine preliminary water quality goals for Lake Granbury
- Present results of the negotiation with TAES for the BST project

Next Steps:

- Modelers begin model development, research areas where literature values will be used to fill data gaps
- Begin collection of BST samples
- Report on waterfowl count progress

Seventh Stakeholder Meeting (Oct. 2, 2007): Staff from the Brazos River Authority and the Texas Commission on Environmental Quality held a meeting in Granbury at the American Hall.

Objectives of Oct. 2, 2007 meeting:

- Provide update on water quality data collection efforts
- Discuss the impact of the summer flooding and delays that it caused
- Water quality modelers present detailed information regarding the use of literature values and the sources of those values, and results of modeling of one cove system
- Present results of the summer waterfowl count
- Present the results of the trial of the septic tracer dye-test
- Present overall progress report for the project

Next Steps:

- Modelers continue model development, continue to address areas where literature values will be used to fill data gaps
- Begin collection of BST samples (delayed due to summer flooding)
- Continue quarterly waterfowl count
- Begin to identify BMPs that may be viable in the Lake Granbury watershed
- Begin writing portions of the Watershed Protection Plan

Eighth Stakeholder Meeting (Feb. 20, 2008): Staff from the Brazos River Authority and the Texas Commission on Environmental Quality held a meeting in Granbury at the American Hall.

Objectives of Feb. 20, 2008 meeting:

- Provide update on waterfowl counts, bacterial source tracking and land use projects
- Discuss peer review of water quality model by staff from TCEQ, the University of Texas and Texas A&M University
- Water quality modelers present detailed information regarding the use of literature values and the sources of those values, and results of modeling of three cove systems. Stakeholders selected literature values for specific parameters
- Present results of TCEQ random sampling of wastewater treatment plants. Stakeholders chose to discontinue this monitoring.
- Present the status of Hood County's septic tank replacement grant in Oak Trail Shores
- Present information regarding educational program being performed by TWRI. Also, presented information on septic tank malfunctions as a result of inquiries from the October 2007 meeting.
- Present information on Texas A&M's golden algae research project
- Discuss draft chapters of the WPP

Next Steps:

- Modelers continue model development
- Begin collection of raw sewage samples from AMUD and Blue Water Shores wastewater treatment plants per Stakeholder request to develop local data and eliminate need to use literature value
- Continue collection of BST samples (last sample to be collected in April 2008)
- Continue quarterly waterfowl count
- Continue to compile list of BMPs that may be viable in the Lake Granbury watershed
- Continue writing portions of the Watershed Protection Plan as able

Ninth Stakeholder Meeting (Aug. 7, 2008): Staff from the Brazos River Authority and the Texas Commission on Environmental Quality held a meeting in Granbury at the American Hall.

Objectives of Aug. 7, 2008 meeting:

- Stakeholders welcomed new members McGee Duff representing Port Ridglea East, and Bob Brooks representing the Septic Installer Industry. Mr. Brooks replaces Ronnie Mowery who had to resign from the stakeholders group.
- Stakeholders voted in a unanimous decision to remove the Granbury/Hood County Economic Development Corporation from the Stakeholders Group due to lack of attendance and violation of the By-Laws.
- Provide Final Reports on waterfowl counts and land use projects. Stakeholders voted that Land Use Analysis was final.
- Modelers discussed data that has been collected at stakeholder request to reduce reliance on literature values. This update include the Cove Circulation Study which resulted in site specific dispersion coefficients, the Raw Sewage E. coli study which resulted in a new bacteria value for raw sewage and the Septic Dye Tracer Study which provided information about the status of septic system performance and maintenance.
- Modelers gave an update on the status of the Watershed Model and presented preliminary results. Data was presented regarding total pollutant loading for each area in the watershed and what the sources of that loading is, including: cattle, deer, pets, septic systems, wastewater treatment plants, and other non-point source bacterial pollution.
- Modelers introduced the concept of the Pollutant Connectivity Factor which is system for a ranking subwatersheds based on total pollutant loading, fate and transport to the lake as driven by runoff and distance from the lake, and growth and decay rates.
- Staff from Texas Agrilife Research and Extension presented the draft Education and Outreach Plan for the WPP. This is an inclusive tool that stakeholders can draw from to educate the larger Lake Granbury Community regarding the WPP and proposed best management practices.
- Introduced Best Management Practices to stakeholders and discussed the differences between structural and non-structural practices and urban and agricultural practices. Also discussed items to consider when selecting BMPs, including: technical feasibility, efficiency, cost effectiveness, acceptability, and impact on other resources.

Next Steps:

- Modelers complete model development
- Complete analysis of BST samples (last sample was collected in April 2008)
- Present modeling and BST results and compile into unified message.
- Stakeholders begin BMP selection process.
- Refine Education and Outreach Plan as BMP selection progresses.
- Continue writing portions of the Watershed Protection Plan as able

Tenth Stakeholder Meeting (Dec. 3, 2008): Staff from the Brazos River Authority and the Texas Commission on Environmental Quality held a meeting in Granbury at the American Hall.

Objectives of Dec. 3, 2008 meeting:

- The overall objective of this meeting was to review all source identification activities undertaken as part of the WPP. The meeting focused predominantly on water quality modeling results and bacterial source tracking results.
- A brief review of the results of land use analysis, waterfowl counts and water quality monitoring.
- Provided Bacterial Source Tracking Results to stakeholders.
 - Sky Harbor - sources of bacteria were identified to be predominantly from livestock and wildlife.
 - Lake Granbury at Business 377 - sources of bacteria were identified to be predominantly from septic systems, livestock and wildlife.

- Indian Harbor - sources of bacteria were identified to be predominantly from livestock and/or wildlife.
- Waters Edge - sources of bacteria was identified to be predominantly from hogs.
- Port Ridglea East - sources of bacteria were identified to be predominantly from livestock.
- Stakeholders expressed a lack of faith in the BST results because they were in direct opposition to land use analysis results and water quality modeling results. Stakeholders did not express confidence in using this source identification tool to make management decision.
- Modelers discussed the final water quality modeling results from both the watershed model (on-ground modeling) and the cove model (in-water lake modeling). In most locations the models indicated that septic systems and pets are the most likely sources of bacteria. In Rolling Hills Shores and Arrowhead Shores, cattle, deer and feral hogs were also identified as contributors.
- Stakeholders expressed much more confidence in the water quality modeling results and indicated, informally, that they would prefer to use the modeling tools to base their management decisions on.
- Project staff recommended that the stakeholders use watershed/cove models from this point forward to evaluate potential effectiveness of Best Management Practices, focus BMP selection on what can reasonably be controlled, and use routine water quality monitoring to assess effectiveness of BMPs.

Next Steps:

- Stakeholders prioritize which source they want to attempt to control for each area of the lake through BMPs.
- Stakeholders begin BMP selection process.
- Modelers perform analysis of BMPs to determine which ones will have the greatest impacts on improving water quality.
- Refine Education and Outreach Plan as BMP selection progresses.
- Continue writing portions of the Watershed Protection Plan as able.

Eleventh Stakeholder Meeting (Jan. 22, 2009): Staff from the Brazos River Authority and the Texas Commission on Environmental Quality held a meeting in Granbury at the American Hall.

Objectives of Jan. 22, 2009 meeting:

- Stakeholders prioritization of sources for the lake and by area, where they desire site specific solutions, for BMP investigation. Lake-wide source priorities selected by stakeholders are: 1) on-site septic facilities, 2) pet waste management, 3) feeding of wildlife and waterfowl, 4) cove dynamics, 5) livestock management practices, and 6) nutrient management.
- Water Quality Modelers provide an example of BMP modeling run using AMUD sewer expansion plans
- Texas AgriLife Research provide an update on upcoming educational activities

Next Steps:

- Hold BMP Workshop to select BMPs that will address the stakeholder's source priorities.
- Distribute results of BMP workshop to stakeholders group.
- Analyze BMPs selected at BMP Workshop based on: impact on water quality, time to implement, cost effectiveness, availability of funding, community acceptability, and political acceptability.
- Present results of BMP analysis to stakeholders group.
- Stakeholders select BMPs for inclusion in WPP.

BMP Workshop (Feb. 3 2009): Staff from the Brazos River Authority, Hood County Health Department, City of Granbury, Acton Municipal Utility District, Espey Consultants, USDA-NRCS, Texas AgriLife Research, and stakeholders who volunteered to attend the workshop held a meeting in Granbury at the Brazos River Authority's Lake Granbury Lake Office.

Objectives of Feb. 3, 2009 workshop:

- Select BMPs that will address the stakeholder's source priorities. Group selected 16, lake-wide BMPs for further investigation. Area specific BMPs were also selected for Blue Water Shores, Rolling Hills Shores, Long Creek, Oak Trail Shores, Sky Harbor, Nassau Bay II, Waters Edge, Indian Harbor, and Port Ridglea East.
- BMP list from workshop was distributed to WPP stakeholders on March 9, 2009.

Next Steps:

- Analyze BMPs selected at BMP Workshop based on: impact on water quality, time to implement, cost effectiveness, availability of funding, community acceptability, and political acceptability.
- Present results of BMP analysis to stakeholders group.
- Stakeholders select BMPs for inclusion in WPP.

Twelfth Stakeholder Meeting (Jun. 23, 2009): Staff from the Brazos River Authority and the Texas Commission on Environmental Quality held a meeting in Granbury at the American Hall.

Objectives of Jun. 23, 2009 workshop:

- Review of Management Measures selected at BMP workshop
- Discussion of evaluation procedures used to analyze and rank management measures
- Discussion of site-specific management measures analysis for the Rolling Hills Shores area

Next Steps:

- Hold Financial Work Group meeting to review the methodology used for developing the financial model and cost index used to compare costs.
- Distribute results of Financial Work Group to stakeholders group.
- Continue presentation of site-specific management measure analysis to stakeholders
- Gather and address stakeholders comments

Financial Work Group (Jul. 16 2009): Staff from the Brazos River Authority, City of Granbury, Acton Municipal Utility District, Granbury Chamber of Commerce, and stakeholders Mary Ward and Sue Brookmole were selected by the Stakeholders to participate in the Financial Work Group Meeting. The meeting was held on July 16, 2009 in Granbury at the City of Granbury's City Council Conference Room. Espey Consultants presented the methodology used for estimating cost of construction of proposed management measures and for developing the cost index used to compare costs of management measures. The group found that the financial modeling approach used by Espey was fine and sound and no major amendments or changes to the process were requested.

Thirteenth Stakeholder Meeting (Jul. 21, 2009): Staff from the Brazos River Authority and the Texas Commission on Environmental Quality held a meeting in Granbury at the American Hall.

Objectives of Jul. 21, 2009 workshop:

- Present outcome of Financial Work Group meeting to Stakeholders.
- Continue discussion of site-specific management measures analysis for the Oak Trail Shores, Long Creek and Sky Harbor areas.

Next Steps:

- Continue presentation of site-specific management measure analysis to stakeholders
- Gather and address stakeholders comments

Fourteenth Stakeholder Meeting (Aug. 18, 2009): Staff from the Brazos River Authority and the Texas Commission on Environmental Quality held a meeting in Granbury at the American Hall.

Objectives of Aug. 18, 2009 workshop:

- Complete discussion of site-specific management measures analysis for the Nassau Bay II, Waters Edge, Indian Harbor, Port Ridglea East, Blue Water Shores, and the Walnut Creek areas.
- Discussion of comments received to date.
- Stakeholder made the decision on that the average age per on-site sewage facility used for developing life cycle costs be 20 years.

Next Steps:

- Investigate the number of lots used in the model to account for the presence of double and triple lots in selected subdivisions.
- Update and present water quality analysis.
- Present summary of proposed educational programs and associated costs
- Review stakeholders comments and proposed responses
- Decisions on number of lots per selected area and ranking matrix

Fifteenth Stakeholder Meeting (Sep. 3 2009): Staff from the Brazos River Authority and the Texas Commission on Environmental Quality held a meeting in Granbury at the American Hall.

Objectives of Sep. 3, 2009 workshop:

- Presented the results of the investigation into the presence and number of double and triple lots in selected subdivisions.
- Updated and presented water quality analysis. No significant changes to areas of concern were identified.
- Presented summary of proposed educational programs and associated costs
- Reviewed stakeholders comments, requested final comments on management measures and how Project Team is planning to address each comment
- Stakeholders made a decision on number of lots per selected area they would like Project Team to use and how they would like the ranking matrix to be presented
- Stakeholders made a decision on management measures they do not wish to pursue further

Next Steps:

- Present changes to management measure analysis based on Stakeholder comments and decisions made in August 2009.
- Begin selecting, by area, the management measures the Stakeholder's wish to have included in the Watershed Protection Plan.

Sixteenth Stakeholder Meeting (Nov. 17 2009): Staff from the Brazos River Authority and the Texas Commission on Environmental Quality held a meeting in Granbury at the American Hall.

Objectives of Nov. 17, 2009 workshop:

- Presented Draft Report #1 and received comments from the Stakeholders
- Discussed Stakeholder priorities for implementation
- Reviewed and revised Stakeholder goals
- Discussed Interim Measurable Milestones
- Stakeholders approved Interim and Implementation Monitoring Plans
- Reviewed implementation responsibilities with Stakeholders
 - During this discussion Stakeholders requested a Watershed Coordinator to help them navigate the implementation process and assist them with identifying and obtaining funding

- Discussed upcoming grant funding opportunities
 - Stakeholders requested that 319 funding be pursued to hire a Watershed Coordinator and implement the Education and Outreach Plan outlined in the Lake Granbury WPP
 - Stakeholders requested that Brazos River Authority hire Watershed Coordinator and that Texas AgriLife Research and Extension implement the Education and Outreach Plan

Next Steps:

- Revise Draft Report based on Stakeholder input, incorporate Measurable Milestones and Monitoring Plans into Draft Report
 - Submit Draft #2 to Stakeholders for review by January 8, 2010
- Develop and submit 319 Grant Proposal for funding for Watershed Coordinator and implementation of Education and Outreach Plan

Seventeenth Stakeholder Meeting (Jan. 14, 2010): Staff from the Brazos River Authority and the Texas Commission on Environmental Quality held a meeting in Granbury at the Granbury REALTORS Association Building.

Objectives of Jan. 14, 2010 workshop:

- Informed Stakeholders that 319 Grant Proposal for funding for Watershed Coordinator and implementation of Education and Outreach Plan submitted to TCEQ on December 15, 2009
- Presented Draft Report #2 and received comments from the Stakeholders. Stakeholders requested that Draft WPP be reviewed by TCEQ and EPA prior to final approval.
- Discussion of Available Funding Options. The following representatives of funding agencies attended to discuss funding programs:
 - Texas Water Development Board – Bruce Crawford and Mark Pearson
 - Texas Department of Rural Affairs – Kevin Smith
 - Rural Development – Russell Peckham
 - Natural Resource Conservation Service – Bill O'Quin
- Stakeholders did request the formation of an Executive Committee, a smaller component of the overall group, to work closely with the Watershed Coordinator to pursue implementation of the WPP. Stakeholders selected the following groups and/or individuals to serve on the Executive Committee: Hood County, City of Granbury, Acton Municipal Utility District, the Granbury Chamber of Commerce and the Vice Chairman of the Brazos Valley Soil and Water Conservation District.

Next Steps:

- Revise Draft Report based on Stakeholder input and send Draft #3 for one final stakeholder review
- Receive and incorporate Stakeholder comments on Draft #3
- Submit Draft #4 to TCEQ and EPA for review
- Receive and incorporate comments from TCEQ and EPA and prepare Final Draft #5
 - Received comments from TCEQ on April 22, 2010
 - Received comments from EPA on May 26, 2010
 - Sent Final Draft #5 to Stakeholders on June 24, 2010
- Informed Stakeholders that we were unsuccessful in our pursuit of 319 funding for the Watershed Coordinator and Education and Outreach Plan on June 16, 2010
- Informed them that another opportunity for Base Categorical Funding would be occurring in early July and that we are re-tooling the grant in anticipation of submitting and RFP. Two The two substantial changes proposed are:
 - Having Texas AgriLife perform the Watershed Coordinator role and implement the Education Plan.

- Adding a Task in the second and third years of the grant to provide funding for a 1-time pump-out of the holding tanks in the 100-year floodplain in Rolling Hills Shores.

Eighteenth Stakeholder Meeting (Jul. 7, 2010): Staff from the Brazos River Authority and the Texas Commission on Environmental Quality will hold a meeting in Granbury at the Granbury REALTORS Association Building.

Objectives of Jun. 7, 2010 workshop:

- Discuss and vote to adopt Final Draft of WPP – Stakeholders approved Final Draft of WPP
- Stakeholders selected preferred format for publication of report
- Discuss changes to grant application for Watershed Coordinator and the Education and Outreach Plan

Next Steps:

- Submit final version of Lake Granbury WPP to TCEQ – submitted to TCEQ on August 3, 2010
- Submit grant application for Watershed Coordinator and the Education and Outreach Plan – will be submitted to TCEQ by August 31, 2010
- Hold first meeting of Executive Committee in August or September
 - Invite James Earp of the City of Kyle to discuss innovative funding techniques that the City has utilized to fund implementation of the Plum Creek WPP management strategies