

**Water Quality Monitoring in the Geronimo Creek Watershed and Facilitation of the
Geronimo and Alligator Creeks Watershed Partnership**
Guadalupe-Blanco River Authority
FY2011 CWA Section 319(h)
Project No. 11-06

Quarterly Report Number 9

Covering work accomplished October through December, 2013

January 10, 2014

I. Abstract

Water quality monitoring was continued. Wet weather targeted monitoring for the winter quarter was conducted in December. A significant rain event occurred on October 31, 2013. Because of this event all the routine monitoring sites were flowing in November. The third newsletter, *The Geronimo Flow*, was distributed to stakeholders. Two septic system workshops were held on November 12 and 13, 2013.

II. Overall Progress and Results by Task

TASK 1: Project Administration

Subtask 1.1: GBRA will prepare electronic quarterly progress reports (QPRs) for submission to the TSSWCB. QPRs shall document all activities performed within a quarter and shall be submitted by the 15th of January, April, July and October. QPRs shall be distributed to all project partners and posted to the project website.

- GBRA prepared the progress report for July through September 2013 and submitted the report on October 11, 2013.

75% complete – On-going

Subtask 1.2: GBRA will perform accounting functions for project funds and will submit appropriate Reimbursement Forms to TSSWCB at least quarterly.

- GBRA submitted the invoice for July through September 2013 on October 25, 2013.
- GBRA submitted the annual MBE/WBE report to TSSWCB on October 22, 2013.

75% complete – On-going

Subtask 1.3: GBRA will host coordination meetings or conference calls, at least quarterly, with Project Partners to discuss project activities, project schedule, communication needs, deliverables, and other requirements. GBRA will develop lists of action items needed following each project coordination meeting and distribute to project personnel.

- Many calls and emails were shared between GBRA, Extension, TSSWCB, and Partnership members, to coordinate septic system workshops, review of newsletter and newspaper articles, submission of new grant applications (TSSWCB and TCEQ), and to coordinate a booth set up at the 73rd annual Texas SWCD Conference in Fort Worth.

75% complete – On-going

Subtask 1.4: GBRA will continue to host and maintain a website (<http://geronimocreek.org/>) to serve as a public clearinghouse for all project- and watershed-related information. All presentations, documents and results will be posted to this website. The website will serve as a means to disseminate information to stakeholders and the general public. Extension shall contribute content matter for the website as appropriate.

- The Geronimo Creek Partnership webpage was updated with the Partnership meeting notice and other project related information (project maps) and to post the third newsletter (Exhibit 4).
- Extension and GBRA updated the project web page publications tab contents and added three fact sheets to the septic systems tab, with the potential to add several more in the coming months. Copies of the fact sheets are found in Exhibit 1. Fact sheets include:
 - Operation and maintenance.
 - Understanding and maintaining your septic system.
 - Responding to power outages and floods.

70% complete – On-going

TASK 2. Quality Assurance

Subtask 2.1: GBRA will develop a QAPP for activities in Task 4 consistent with the most recent versions of EPA Requirements for Quality Assurance Project Plans (QA/R-5) and the TSSWCB Environmental Data Quality Management Plan.

Consistent with Title 30, Chapter 25 of the Texas Administrative Code, Environmental Testing Laboratory Accreditation and Certification, which describes Texas' approach to implementing the National Environmental Laboratory Accreditation Conference (NELAC) Standards, shall be required.

All monitoring procedures and methods prescribed in the QAPP shall be consistent with the guidelines detailed in the TCEQ Surface Water Quality Monitoring Procedures, Volume 1: Physical and Chemical Monitoring Methods for Water, Sediment, and Tissue (RG-415) and Volume 2: Methods for Collecting and Analyzing Biological Assemblage and Habitat Data (RG-416).

- No work was performed under this task in this quarter.

100% completed – On-going

Subtask 2.2: GBRA will implement the approved QAPP. GBRA will submit revisions and necessary amendments to the QAPP as needed.

- No work was performed under this task in this quarter.

60% completed – On-going

TASK 3. Support and Facilitation of WPP Implementation

Subtask 3.1: Extension will continue to employ a Geronimo Creek Watershed Coordinator to engage and facilitate the Geronimo Creek Watershed Partnership. In coordination with GBRA, the Watershed Coordinator will be responsible for the general oversight and coordination of all project activities, be responsible for reporting requirements and directing educational activities, and serve as the primary conduit for interaction with landowners, citizens, and entities to facilitate the implementation of the WPP. The Watershed Coordinator shall successfully complete (or have already completed) the Texas Watershed Planning Short Course. The Watershed Coordinator shall participate in Texas Watershed Coordinator Roundtables and the TSSWCB Southeast and South Central Texas Regional Watershed Coordination Steering Committee meetings, as necessary.

- The facilitation by AgriLife Extension continued under this contract. Major activities facilitated include planning for the next quarterly Partnership meeting (January 14, 2014 – agenda found in Exhibit 2), the coordination of the Homeowner Septic System classes offered in November, and manning the informational booth set up at the 73rd Texas SWCDs Conference in Fort Worth.
- Additional tasks completed this quarter include the drafting and production of 3 newspaper articles for publication in two local newspapers. Copies of the paid articles can be found in Exhibit 3.
 - October 10, 2013 - general overview of project,
 - November 21, 2013 - an agricultural BMP (vegetative filter strips),
 - December 19, 2013 - septic system maintenance
- November 18, 2013 - The third quarterly newsletter was developed, reviewed, and distributed to stakeholders. A copy of the newsletter can be found in Exhibit 4.
- November 12 and 13, 2013 - The Homeowner Maintenance of Septic Systems classes were held in Seguin and New Braunfels on the dates listed respectively. A news release was developed and issued on November 7. On October 25, 2013 a flyer was sent out attached to an email notifying stakeholders of the workshop, followed by an email reminder on November 7. Copies of the news release, the 2013 flyer and the attendance sheets are included in Exhibit 5.
- With the completion of the 2013 OSSF classes, planning and coordination began to bring the classes back in the spring of 2014. Spring classes will be the basic 2 hour class and the 6 hour class that focuses on aerobic systems. The copy of the 2014 flyer can be found in Exhibit 6.
- Extension and GBRA began planning for the Low Impact Development workshop to be held March 25, 2014. Numerous phone calls and emails were shared in preparing for this event.

75% completed – On-going

Subtask 3.2: Extension will facilitate public participation and stakeholder involvement in the watershed planning process, specifically by facilitating meetings of the Partnership Steering Committee (at least quarterly) and Work Groups (as needed) to provide regular updates on the status of monitoring efforts, progress in identifying implementation funding, and movement towards water quality restoration and seek input and recommendations on needed activities. Extension will coordinate meetings, secure meeting locations, prepare and disseminate meeting notices and agendas. Meeting summaries will be prepared and posted to the project website. The WC will provide counties, cities and other partners with updates on progress of implementation of the WPP, if they are unable to regularly attend Partnership Steering Committee meetings.

- November 18, 2013 - Extension produced the third newsletter, *The Geronimo Flow*, and distributed it to stakeholders. The newsletter was posted to the project website. A copy of the newsletter can be found in Exhibit 4.
- Extension began purchasing space on a monthly basis in the Seguin and New Braunfels newspapers, for the purpose of publishing articles to raise awareness of the project, educate readers regarding BMPs that can have a direct impact on water quality, and to inform readers about project highlights. Three articles were published this quarter. Copies of the ad/articles can be found in Exhibit 3.
 - October 10, 2013- a general overview of the project,
 - November 21, 2013 - an agricultural BMP (vegetative filter strips),
 - December 19, 2013 - on septic system maintenance.
- Extension and GBRA worked with the feral hog education specialist, Jared Timmons, to schedule the first ever Feral Hog Workshop in the Geronimo Creek watershed for May 23. Information on the workshop was included in the newsletter (Exhibit 4).
- Planning began for the next quarterly partnership meeting. Presenters were contacted and the agenda was finalized. A copy of the agenda can be found in Exhibit 2.

70% completed – On-going

Subtask 3.3: Extension will assist governmental and non-governmental organizations (i.e., responsible parties in the Geronimo Creek WPP) in identification and acquisition of resources (financial and technical) to enable WPP implementation. Extension will actively seek and pursue funding opportunities and work with partners to develop grant proposals. The WC will work with state and federal agencies, as appropriate, to bring technical and financial resources to the watershed.

- Extension made contact with representatives from the Cities of Seguin and New Braunfels for the purpose of engaging them in conversation to explore the potential for developing grant proposals for the TCEQ 319(h) Nonpoint Source Program. Extension worked extensively with New Braunfels through the development of a 319(h) proposal to TCEQ for a feasibility and construction design project for the flood detention structure behind the Creekside development and for low impact

development techniques at the New Braunfels Regional Airport. Seguin declined since they are starting their contract with TCEQ on a grant award to decommission failing septic systems in the Oak Village North subdivision as they tie those homes onto the city's wastewater collection system.

70% completed – On-going

Subtask 3.4: Extension will 1) evaluate and track progress toward achieving milestones established in the WPP; and, 2) work with GBRA to assess water quality data collected through the Clean Rivers Program, this project, and other data collection efforts in relation to achieving load reductions. Extension will develop, publish, print, and distribute to stakeholders, a biennial addendum to the Geronimo Creek WPP that describes modifications/updates to goals and milestones, explains new understandings of sources and cause of water quality issues, documents success in achieving goals and milestones, and success in achieving water quality improvement and load reductions. As the WPP will be published in fall 2012, this draft biennial addendum would most appropriately be published in fall 2014. This draft biennial addendum will function as the Final Report for this project.

- Extension continued development and updating the spreadsheets for the purpose of tracking implementation activities. All implementation activities listed in Tables 8.1 and 8.2 will be carefully monitored and updated as implementation proceeds. Current version of the spreadsheet can be found in Exhibit 7.
- GBRA and Extension will look at the latest data collected and present it to the stakeholders at the January Partnership meeting.

70% completed– On-going

Subtask 3.5: Extension will coordinate education and outreach activities as identified in the Geronimo Creek WPP. GBRA will make presentations on the Geronimo Creek Partnership and WPP and general NPS pollution information to local schools and community organizations. Extension will support, promote, and participate in, as appropriate, any field days, demonstrations, site tours, or education events sponsored by AgriLife Extension, USDA-NRCS, and/or SWCDs for the Geronimo Creek watershed.

- November 12, and 13, 2013 - Extension and GBRA hosted two homeowner septic system classes in Seguin and New Braunfels. The classes were advertised through multiple press releases, emails, in the newsletter, and on the project web page (Exhibit 5).
- November 6, 2013 - Debbie Magin made a presentation at the Watershed Planning Short Course, covering the wastewater permitting process, its importance in the watershed planning process and how to introduce wastewater treatment to stakeholders. Presentation can be found in Exhibit 8.
- October 28-29, 2013 - Extension purchased booth space at the 73rd SWCD Conference in Fort Worth. A table top display of the project was set up and nearly 75 copies of the Geronimo and Alligator Creeks WPP were distributed to attendees.
- October 8, 2013 – Debbie Magin attended the Seguin Planning and Zoning Commission meeting that was the continuation of the discussion on a zoning

change in the watershed held August 13, 2013. At the August meeting there was discussion on the future site of the Helmerich and Payne (H&R) International Drilling Co.'s headquarters. The company will be located on SH123, between the Continental facility and Cordova Road (near the Big Red Barn). The company provides piping and rigs to oil field drilling sites. No actual drilling will occur on the site. The site will consist of staging areas, pipe storage, truck parking and an administration building. The Guadalupe County Agriculture and Heritage Center (The Big Red Barn) contacted GBRA with concerns that the runoff from the construction and daily operation of the site could impact Geronimo Creek. Based on the H&R site utilization plan presented at the October meeting there should be little to no impact to the creek. I did visit with the representatives of the company and invited them to become a part of the Geronimo Creek Watershed Partnership.

75% completed – On-going

Subtask 3.6: GBRA will include information about this project in GBRA newsletters (e.g., *River Run*) and Clean Rivers Program publications regarding progress to implement the Geronimo Creek WPP. GBRA will solicit content matter for these publications from Project Partners as appropriate.

- GBRA's Public Communication Department gave presentations on water quality, macroinvertebrates and nonpoint source pollution, focusing on Geronimo Creek, to school groups from the Seguin and surrounding area:
 - October 10-11, 2013 – Seguin Outdoor Learning Center to Bowie Elementary (San Marcos ISD) – talked about Geronimo Creek, looked at macroinvertebrates found in creek
 - October 28-November 1, 2013 – Big Red Barn Ag Heritage Days
 - November 18, 2013 – Seguin Boy Scouts
 - November 26, 2013 – Weinert Elementary (Seguin ISD) classroom presentation

75% completed– On-going

Subtask 3.7: Extension will develop, publish, and distribute 4 semi-annual newsletters that are designed to keep landowners and entities informed of ongoing WPP implementation activities, including water quality data collection and progress toward achieving milestones in the WPP. The newsletter shall be distributed as most appropriate to individual landowners and entities in the watershed. Extension will solicit content matter for the newsletters from project partners as appropriate.

- November 18, 2013 - Extension compiled the third newsletter, "*The Geronimo Flow*". The newsletter was distributed via email to stakeholders and posted to a new tab created on the project webpage (Exhibit 4).

70% completed – On-going

Subtask 3.8: Extension will facilitate communication with stakeholders in order to engage the public and affected entities in WPP implementation. Extension will utilize all appropriate communication mechanisms including direct mail, e-mail, the project website,

and mass media (print, radio, television). Extension will develop and disseminate general project informational materials, including, but not limited to, flyers, brochures, letters, factsheets, news releases, and other appropriate promotional publications. Extension will develop and utilize a listserv (e.g., <http://listserv.tamu.edu/>) to facilitate direct discussion between stakeholders. Extension will explore the appropriate use of social media (i.e., Facebook) as a stakeholder communication mechanism for this watershed. Extension will solicit content matter for educational materials from project partners as appropriate.

- Extension emailed the steering committee information about the upcoming meeting, and the upcoming Septic System classes. A press release was released, along with posting the meeting to the community calendars, and notifying local radio. (Exhibit 5)
- Extension and GBRA partnered to make edits and fund the production of materials designed in the Seguin High School summer project based learning academy for distribution to the local restaurants and businesses. Copies of the final outreach materials can be found in Exhibit 9.
- The relationship with the Seguin newspaper has grown since Extension began purchasing newspaper space. The sales director created (at no expense) a web advertisement that floats on the online version of the newspaper's home page, that uses the project logo and with one click, will direct the reader to the project webpage. It is believed that this has served to almost double the web traffic to the project page during the month of December. Further testing will be conducted to explore this possibility. An example of the "clickable" ad can be found in Exhibit 10.
- December 12, 2013 - Extension and GBRA added three fact sheets to the septic systems tab, with the potential to add several more in the coming months (Exhibit 1). Local interest in the septic system maintenance classes is growing, and GBRA and Extension are responding.
 - Operation and maintenance.
 - Understanding and maintaining your septic system.
 - Responding to power outages and floods.

70% completed – On-going

Subtask 3.9: Extension will make deliberate efforts to increase awareness of the WPP and secure implementation support thereof from county and municipal governments throughout the watershed.

- Extension made contact with representatives from the Cities of Seguin and New Braunfels for the purpose of engaging them in conversation to explore the potential for developing grant proposals for the TCEQ 319(h) Nonpoint Source Program. Extension worked extensively with New Braunfels through the development of a 319(h) proposal to TCEQ for a feasibility and construction design project for the flood detention structure behind the Creekside development and for low impact development techniques at the New Braunfels Regional Airport. Seguin declined since they are starting their contract with TCEQ on a grant award to decommission failing septic systems in the Oak Village North subdivision as they tie those homes onto the city's wastewater collection system.

- Extension and GBRA have been in contact with Seguin and New Braunfels to receive feedback on what they would like to see in the upcoming Low Impact Development workshop (formerly planned to be called the NEMO workshop). The workshop agenda is being developed accordingly.

70% completed– On-going

Subtask 3.10: Extension will maintain a spreadsheet of watershed stakeholders and affected parties for use in engaging the public in the watershed planning process. The spreadsheet will be added to based upon previous efforts of Extension in TSSWCB project 08-06. The spreadsheet will represent a diverse cross section of Geronimo Creek landowners, citizens, local businesses, local and regional governmental entities and elected officials, state and federal agencies, and environmental and special interest groups.

- Extension updated the stakeholder email spreadsheet with participant emails obtained from the first round of septic system classes. These classes added 20 new contacts to the stakeholder list (Exhibit 5).

70% completed – On-going

Subtask 3.11: Extension will attend and participate in other public meetings as appropriate in order to communicate project goals, activities and accomplishments to affected parties. Such meetings may include, but are not limited to, city councils, county commissioners' courts, Clean Rivers Program Basin Steering Committee and Coordinated Monitoring, local soil and water conservation districts (SWCDs), groundwater conservation districts and other appropriate meetings of critical watershed stakeholder groups.

- October 28-29, 2013 - Extension purchased booth space at the 73rd SWCD Conference in Fort Worth. A table top display of the project was set up and nearly 75 copies of the Geronimo and Alligator Creeks WPP were distributed to attendees.

70% completed – On-going

TASK 4. Water Quality Data Collection and Analysis

Subtask 4.1: GBRA will conduct routine ambient monitoring at seven sites once per month, collecting field, conventional, flow and bacteria parameter groups. The QAPP developed in Task 2 will precisely identify the sites. The sampling period extends over 21 months. The number of samples planned for collection through this subtask is 147. Currently, routine ambient monitoring is conducted monthly at one station by GBRA (12576) through the Clean Rivers Program. Sampling through this subtask will complement existing routine ambient monitoring regimes such that routine water quality monitoring is conducted monthly at eight sites in the Geronimo Creek watershed. GBRA's Regional Laboratory will conduct sample analyses. Field parameters are pH, temperature, dissolved oxygen and conductance. Conventional parameters are total suspended solids, turbidity, sulfate, chloride, nitrate nitrogen, ammonia nitrogen, total kjeldahl nitrogen,

chlorophyll-a, pheophytin, total hardness, and total phosphorus. Flow parameters are flow collected by gage, electric, mechanical or Doppler, including severity. Bacteria parameter is *E. coli* enumerated using USEPA Method 1603.

- October 9, 2013 -
 - Routine monitoring at seven sites - CRP monitoring at one site. Two sites were dry with pools (Geronimo Creek at Huber Road (20742) and Alligator Creek at Huber Road (20743)).
- November 11, 2013 -
 - Routine monitoring at seven sites - CRP monitoring at one site. All sites flowing due to significant rainfall on October 31, 2013.
- December 9, 2013 -
 - Routine monitoring at seven sites - CRP monitoring at one site. The routine sampling was conducted under wet weather conditions.

70% completed – On-going

Subtask 4.2: GBRA will conduct routine ambient monitoring at six sites once per quarter year, collecting field, conventional, flow and bacteria parameter groups; specific parameters are defined in Subtask 4.1. The QAPP developed in Task 2 will precisely identify the sites. The sampling period extends over seven seasons. The number of samples planned for collection through this subtask is 42. Spatial and seasonal variation will be captured in these snapshots of watershed water quality. GBRA's Regional Laboratory will conduct sample analyses.

- Routine targeted monitoring (dry conditions) was not conducted in this quarter.

70% completed – On-going

Subtask 4.3: GBRA will conduct biased flow monitoring at fourteen sites once per season under wet conditions, collecting field, conventional, flow and bacteria parameter groups; specific parameters are defined in Subtask 4.1. These sites shall be the same as the sites for routine ambient monitoring described in subtasks 4.1-4.2. If a storm event was captured under routine monitoring in subtasks 4.1-4.2, a separate biased flow sample will not be collected under this subtask. The QAPP developed in Task 2 will precisely identify the sites. The sampling period extends over seven seasons. The number of samples planned for collection through this subtask is 98. Spatial, seasonal and meteorological variation will be captured in these snapshots of watershed water quality. GBRA's Regional Laboratory will conduct sample analyses.

- Wet weather monitoring for the winter quarter was conducted on December 9, 2013. Of the six targeted and eight routine sites, three sites were dry (Alligator Creek at Barbarosa Road (20750), Alligator Creek at FM 1102 (20748), and Alligator Creek at FM 1101 (20749)). Four sites were dry with pools (Alligator Creek at Huber Road (20743), Unnamed Tributary at Laubach Road (20753), Geronimo at Huber Road (20742), and Baer Creek at Walnut St. (20744)).

70% completed – On-going

Subtask 4.4: GBRA will conduct routine groundwater monitoring at up to four sites (e.g., two spring and two wells) once per quarter year, collecting field, conventional, flow and bacteria parameter groups; specific parameters are defined in Subtask 4.1. The QAPP developed in Task 2 will precisely identify the sites. The sampling period extends over seven quarters. The number of samples planned for collection through this subtask is 28. GBRA's Regional Laboratory will conduct sample analyses.

- Routine groundwater monitoring was not conducted in this quarter. The fall quarter was sampled in September and the winter quarter will be collected in January.

60% completed – On-going

Subtask 4.5: GBRA will transfer monitoring data from activities in subtasks 4.1-4.4 to TSSWCB for inclusion in the TCEQ SWQMIS at least quarterly. Data will be transferred in the correct format using the TCEQ file structure along with a completed Data Summary, as described in the most recent version of the *TCEQ Surface Water Quality Monitoring Data Management Reference Guide*. GBRA will post data from monitoring activities collected in subtasks 4.1-4.4 to the project website in a timely manner. GBRA will submit Station Location Requests to TCEQ, as needed, to obtain TCEQ station numbers for new monitoring sites. Data Correction Request Forms will be submitted to TSSWCB whenever errors are discovered in data already reported. All monitoring data files, data summary reports and data correction request forms will also be provided to Extension. GBRA will input monitoring regime, as detailed in the QAPP, into the TCEQ CMS.

- Water quality data collected in September, October and November 2013 was submitted to the TCEQ IT manager on December 11, 2013.

70% completed – On-going

Subtask 4.6: GBRA will develop a final Assessment Data Report summarizing water quality data collected through Task 4. The Report shall, at a minimum, provide an assessment of water quality with respect to effectiveness of BMPs implemented and a discussion of interim short-term progress in achieving the Geronimo Creek WPP water quality goals. GBRA will summarize the results from Task 4 in the GBRA's Clean Rivers Program Basin Highlights Report and Basin Summary Report. GBRA will provide updates on the results and activities of Task 4 to the Steering Committee.

- No work was performed under this task in this quarter.

0% completed – On-going

III. Related Issues/Current Problems and Favorable or Unusual Developments

- Routine monitoring was conducted.
- Two septic system workshops were held.
- Wet weather monitoring was conducted in the quarter.
- The third newsletter, *The Geronimo Flow*, was sent to stakeholders and posted on

webpage.

- Three news articles were run in the Seguin and New Braunfels newspapers.
- Three fact sheets were posted to webpage.

IV. Projected Work for Next Quarter

The following will be accomplished during the coming quarter:

- a. Monitoring will continue at routine sites.
- b. Data tables will be completed and uploaded to project webpage.
- c. Webpage will continue to be updated.
- d. Newsletter development and distribution will continue.
- e. Extension and GBRA will host and facilitate the LID Workshop March 25th and make plans to host the Homeowner Septic System Maintenance classes on April 28-29.
- f. Extension and GBRA will make plans for the second annual Creek Clean Up Event April 5.
- g. Extension will continue purchasing newspaper space for the purpose of publishing monthly articles that will educate about practices to improve water quality in the area.
- h. Extension will work with project partners to assist the new Comal-Guadalupe SWCD field technician position.
- i. GBRA and Extension will look at the latest data collected and present it to the stakeholders at the January Partnership meeting.

Exhibit 1 - OSSF Fact Sheets

Onsite wastewater treatment systems

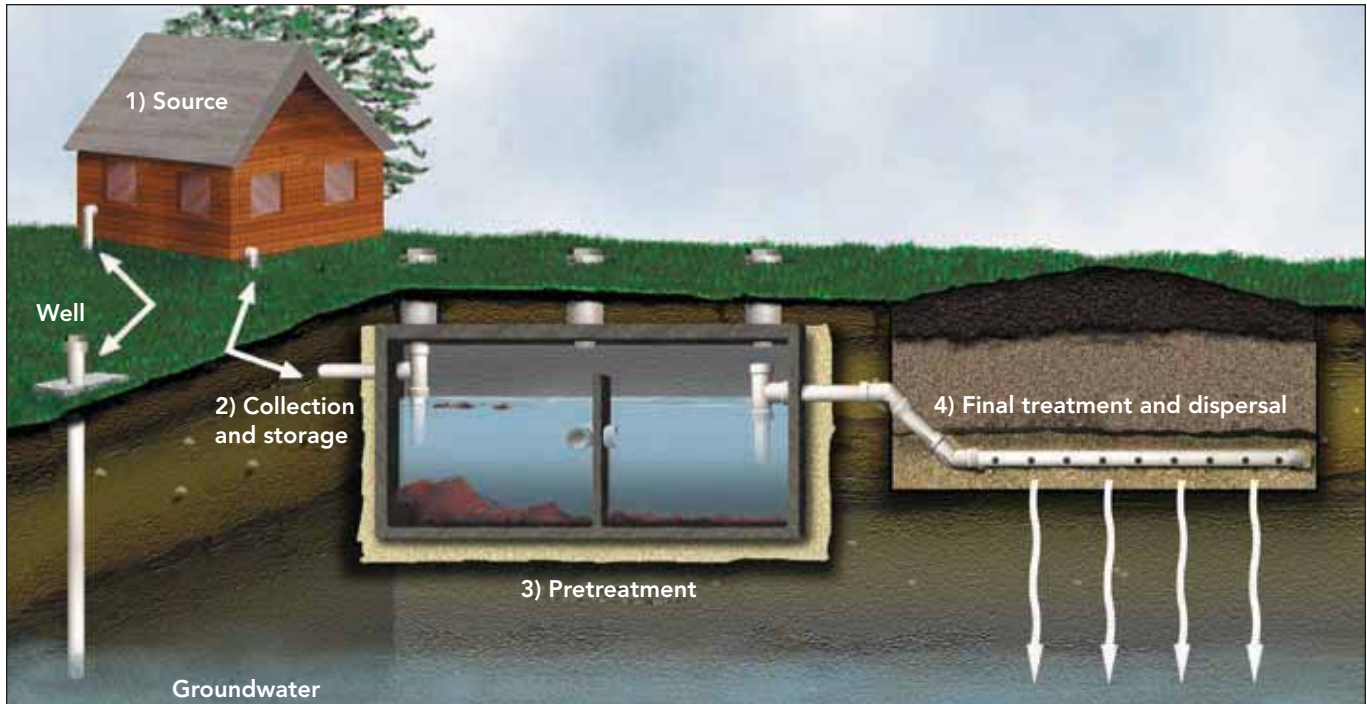


Figure 1: Components of an onsite wastewater treatment system.

Responding to power outages and floods

Bruce Lesikar, Courtney O'Neill and David Smith

Professor and Extension Agricultural Engineer, Extension Assistant and Extension Assistant
 The Texas A&M System

Electrical power outages and floods can affect a home's onsite wastewater treatment system. Onsite wastewater treatment systems remove organic matter, solids and living organisms (viruses, bacteria, and protozoa from wastewater. If a wastewater treatment system stops working properly, it can result

in harm to people and the environment.

The appropriate response to a disaster depends upon the type of disaster and the type of treatment unit at your home. To properly respond, homeowners need to know the components of their on-site wastewater treatment systems as well as the steps to take after a power outage or flood.

Components

Onsite wastewater treatment systems can be divided into four components: 1) wastewater source or use, 2) wastewater collection and storage, 3) pretreatment, and 4) final treatment and dispersal.

The wastewater source or use is the home or a business that the wastewater treatment system is serving.

The wastewater collection system is generally the plumbing that conveys the wastewater from the source to the pretreatment component. Most collection components are constructed of piping with an access port placed on a slope to allow gravity to move the waste and water to the pretreatment component.

However, some collection components have a pump tank and pump placed in the plumbing network to collect wastewater from the source and then pump the wastewater to the pretreatment components.

The pretreatment component varies with site conditions and the type of final treatment and dispersal component installed. Pretreatment components include septic tanks, aerobic treatment units, media filters, constructed wetlands, and/or disinfection units.

The pretreatment component removes contaminants from the wastewater to obtain an effluent (outflow) that can be accepted and treated by the final treatment and dispersal component.

The final treatment and dispersal component completes the treatment process and disperses the effluent into the receiving environment. Final treatment and dispersal components include media-filled trenches, gravel-less trench technology, low-pressure pipe drain fields, drip distribution fields, and spray distribution fields.

For more information on these technologies, visit the Onsite Wastewater Treatment & Reuse Web site at <http://ossf.tamu.edu>.

Electrical outages

The most common cause for an interruption of service for an onsite wastewater treatment system is an electrical outage. The appropriate response depends on the type of pretreatment and final treatment and dispersal components of your onsite wastewater treatment system.

A gravity collection system feeding into a septic tank and gravity distribution soil absorption area will continue to operate properly, and you will be able to continue using your system.

However, if your system contains electrical components, the wastewater will collect in the system during the electrical outage, and it will have to be treated and dispersed after electrical service resumes.

Onsite wastewater treatment components that use electricity include:

- ✓ Aerobic treatment units
- ✓ Sand filters
- ✓ Recirculating media filters

- ✓ Flow equalization tanks
- ✓ Low pressure distribution
- ✓ Subsurface drip distribution
- ✓ Spray distribution

These components usually have a reserve or alarm capacity that allows some water usage during electrical power outages or when the components break. However, that reserve is small.

For example: In Texas, an onsite wastewater treatment system serving a three-bedroom house is required to be able to treat at least 240 gallons of wastewater a day. State regulations stipulate that a system requiring electricity must have minimum reserve capacity of one-third the amount of wastewater that the system was designed to treat in a day. Thus, an onsite wastewater treatment system for a three-bedroom residence must have a reserve capacity of 80 gallons.

In a typical shower, 2.5 gallons are used per minute, so one 10-minute shower would send 25 gallons to the wastewater treatment system. Toilets use from 1.6 to 2.5 gallons per flush. A reserve capacity of 80 gallons would allow very little emergency water usage per day.

If your system has electrically operated components and the power goes out:

- ✓ Limit your water usage to essentials such as toilet flushing and hand washing. Minimize or eliminate laundry, bathing, showering, and dishwashing.
- ✓ Stop all water use if the electrical outage is extended or the plumbing begins to drain slowly. Slow-draining plumbing may indicate that the reserve capacity is exceeded and the system is full. Once power is restored:
- ✓ Limit laundry and dishwashing if your system has an advanced pretreatment component and the power outage is less than 1 day. If the power outage is longer than a day, discontinue these activities for a day, and limit shower time and bathwater volume for at least 1 day. This period allows

the microorganisms that treat the wastewater to begin working again and properly treat the wastewater.

- ✓ Allow the system to continue to operate normally until the water level drops to the normal operating level in the system. A time-dosed system may take 24 hours to have all the stored water distributed and the high-water alarm deactivated.
- ✓ System components that require electricity are usually equipped with a high-water alarm. When the power is restored, this alarm may sound, depending on your water usage during the power outage. You can silence the alarm if it has a silence switch option. Contact your service provider if the alarm remains activated for more than 24 hours.
- ✓ If your final treatment and dispersal component has an on-demand pumping system (that is, if it is a low-pressure or subsurface drip distribution system), you may need to manually control the length of time that the treated wastewater is delivered to the dispersal field immediately after the outage, to prevent flooding of the field. Otherwise, the first dose after the power is restored can overload your system, and untreated wastewater could flow onto your lawn.
- ✓ If the power outage lasted less than a day and you minimized water usage during the outage, your system will probably recover by itself. However, if the power was out for more than a day, check your system design information to find out the usual dosage and rest times. After the power outage, allow the pump to operate for its usual dosage time, then turn the power off by flipping the breaker. Wait for the specified rest period, then allow another dosage for the usual amount of time. Continue this pattern until the pump turns off

by itself after its normal dosage time.

- ✓ An alternative is to ask your service provider for instructions on how your system should be brought back into operation after a power outage.
- ✓ If your system's final treatment and dispersal component is a spray distribution system, and the power outage was longer than 1 day, the effluent being distributed on the ground surface may not be treated to its normal expected quality. You should make sure the disinfection treatment component is working correctly, and limit activity in the distribution area while the ground and grass are moist after the treated wastewater is sprayed there.

Flooding

In a flood, an onsite wastewater treatment system may become inundated with surface water. The extent of the flooding's effect on the system will be related to the amount of water flooding over the system and the length of time the system is flooded.

During a flood:

- ✓ Discontinue electrical power to the system by turning the power off at the main circuit panel.
- ✓ Stop water usage going into the system because it may not receive much treatment.
- ✓ To prevent water from backing up through the system and into the home, plug any floor drains in the home connected to the wastewater treatment system.

After a flood:

- ✓ Do not use the system until the floodwater has receded from all components of the system.
- ✓ Inspect the system for any signs of damage to its surface, such as damaged lids or inspection ports, or exposed components because soil has washed away.
- ✓ If the system components are filled with floodwater, call a service provider to check the system for sediment or other debris. Some water may be removed from the pretreatment components to reduce the water level to the normal operating level. Do not pump the tanks empty or below their normal operating level because the ground will usually be saturated after flooding. Empty tanks are buoyant and will tend to float out of the ground. This upward force can make the tanks shift, which could damage the piping or even cause the tanks to float to the ground surface.
- ✓ If your final treatment and dispersal component is a trench system and it has inspection ports, the service provider may be able to pump water from the trenches to help the soil dry and aerate.
- ✓ If the onsite wastewater treatment system has components requiring electrical power, the ability to restart the system depends on the flood elevation. If the floodwater covered only the tanks and the components in the tanks, the system may be able

to be restarted without further evaluation of the components. If the floodwater covered the components located on the ground surface (such as air pumps or panels), have the system inspected by a service provider to determine the condition of the components before using the system and restarting electrical service.

- ✓ If your system's final treatment and dispersal component is a spray distribution system, the effluent being distributed on the ground surface may not be treated to its normal expected quality. The microbes (microorganisms) providing the treatment need a day or two to recover and provide proper treatment. Make sure the disinfection treatment component is working correctly, and limit activity in the distribution area while the ground and grass are moist after a spray distribution event.

Summary

Electrical power outages and floods can affect your wastewater system. During and after these events, wastewater treatment can be limited and can pose health concerns and hazards if not managed appropriately.

Know the components of your onsite wastewater treatment system and the proper response after a flood or power outage.



This publication was funded by the Rio Grande Basin Initiative administered by the Texas Water Resources Institute of the Texas AgriLife Extension Service, with funds provided through a grant from the Cooperative State Research, Education, and Extension Service, U.S. Department of Agriculture, under Agreement No. 2005-45049-03209.

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Consortium of Institutes for Decentralized Wastewater Treatment	USDA Natural Resources Conservation Service

Texas A&M AgriLife Extension Service

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Onsite wastewater treatment systems

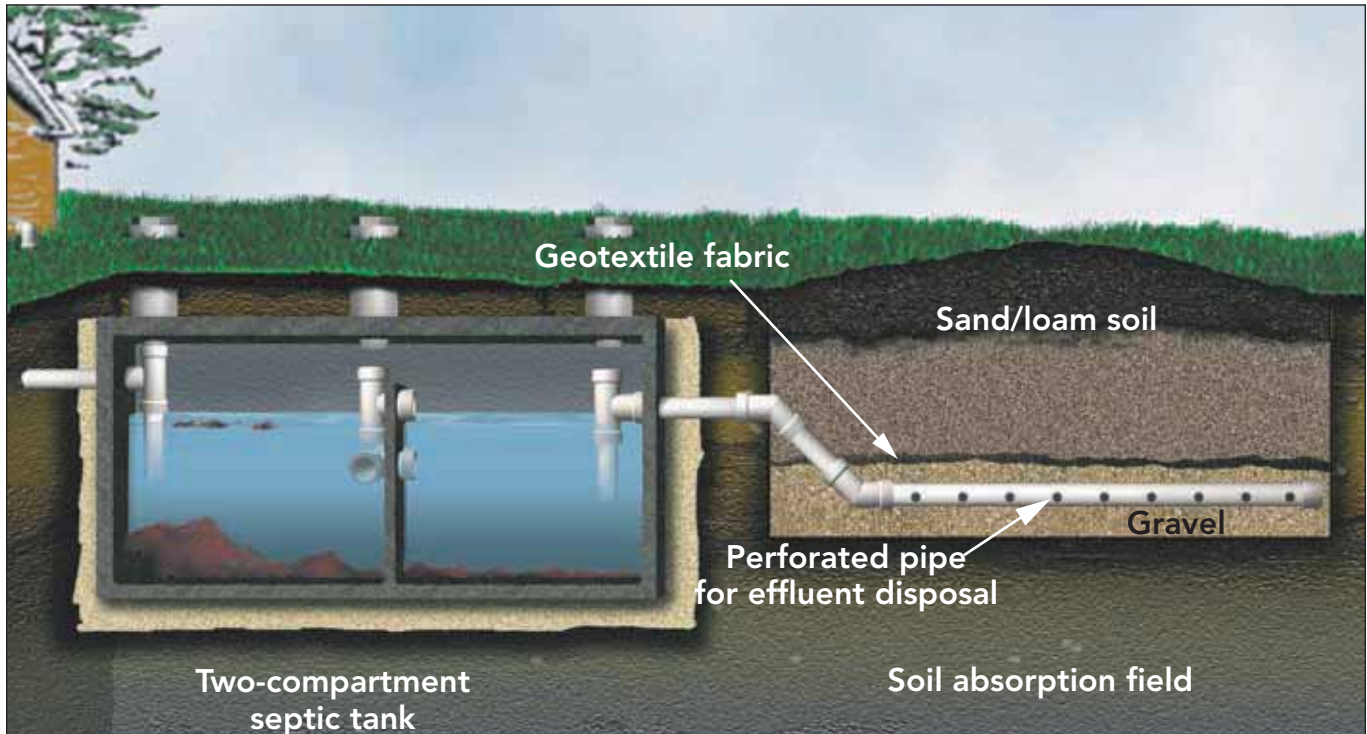


Figure 1: A septic tank and soil absorption field system.

Operation and maintenance

Bruce Lesikar

Professor and Extension Agricultural Engineer
 The Texas A&M System

If your home or business uses an onsite wastewater treatment system, commonly known as a septic system, you need to know how to operate and maintain the system properly to prevent pollution and sewage backups.

For many years, people in the United States viewed onsite wastewater treatment systems as a temporary way to manage wastewater for homes until they were connected to a centralized sewer system. In the past, about 25 percent of the U.S. homes used septic systems. Now, about 37 percent of the homes being built have onsite wastewater treatment systems. Onsite wastewater treatment systems are now considered a permanent solution for treating wastewater.

Consequently, it is vital that residents maintain them regularly so that they do not pollute the environment and pose health hazards to people.

To understand how to operate and maintain onsite wastewater treatment systems, it helps to know how they work and what factors affect them. You may wish to obtain other fact sheets in this series for specifics on a system or consult manufacturers' literature.

A conventional septic system—the most common onsite wastewater treatment system—consists of a septic tank and a soil absorption field. Wastewater from a home or business first goes to the septic tank, an enclosed watertight container where solids are separated from liquid wastes. Microorganisms in the septic tank begin consuming the organic matter, solids, and nutrients in the wastewater.

The wastewater then moves to a soil treatment area, also called a soil absorption field or drain field. There, it travels through perforated pipes to a bed of gravel or other similar material, and then into the soil, where

microorganisms consume more of the contaminants.

The water then moves through the soil and evaporates, is used by plants, or moves to groundwater.

Onsite wastewater treatment systems come in many types and sizes. Each one's operation and maintenance requirements depend on:

- ✓ The treatment method used to remove contaminants from the wastewater.
- ✓ The amount, or volume, of wastewater the system must handle.
- ✓ The strength of the wastewater, or the amount of contaminants it contains. Wastewater contains organic matter, solids, nutrients, and pathogens (disease-causing microorganisms). A residence typically has an average strength of wastewater, while businesses such as restaurants and convenience stores may have high-strength wastewater.

When a house is being built, the size of its onsite wastewater treatment system is determined by the number of bedrooms in the house (square footage) and whether water-conserving fixtures will be used. The system chosen is one that will handle the average volume and strength of wastewater for that size of house.

Onsite wastewater treatment systems differ from the centralized sewer systems used in cities and utility districts. Centralized systems collect wastewater from many houses and businesses, averaging together the amounts and strengths of the wastewater flows. The amount of wastewater from houses that use much water is offset by those that use little. Sewage from homes and businesses are mixed to produce an average strength.

In contrast, an onsite wastewater treatment system and the soil where it is located must be able to treat the amount and strength of the wastewater from that house. Your water-use habits affect how well your onsite wastewater treatment system works.

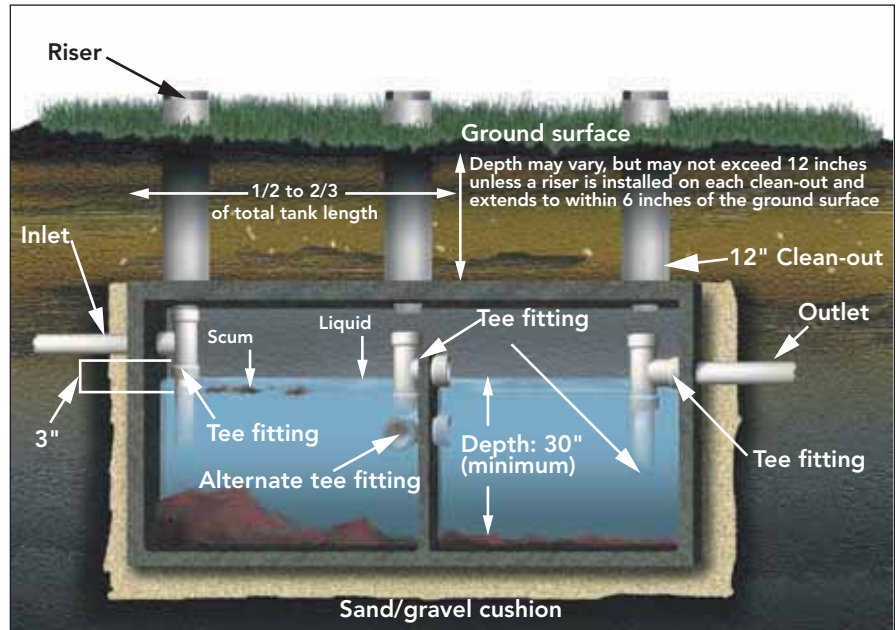


Figure 2: A two-compartment septic tank is an enclosed, watertight container where solids are separated from liquid waste.

If you use more water than average for the size of your house, your system can be overloaded with water, and malfunction. If you want to be able to use more water than average, you may need to install an oversized system.

Your wastewater will be stronger than average if you use a garbage disposal or operate a bakery or day-care facility at home. The wastewater may need additional treatment, such as with an aerobic treatment unit, sand filter or trickling filter, to bring it back to an average strength or remove most of the contaminants.

The site itself is also a factor. An onsite wastewater treatment system is a no-discharge system, which means that the wastewater must stay on the property where it is generated. All contaminants must be removed from the wastewater before it moves through the soil to groundwater.

If your soil does not treat the wastewater enough, as in problem soils such as fractured rock, Karst limestone, or gravelly sand, your onsite wastewater treatment system may need to provide additional treatment before it applies the wastewater to the soil. If the wastewater is not treated adequately before it reaches ground-

water, your water well can become contaminated.

There is one exception to the rule that all the wastewater must be treated on and applied to the property where it is generated. A cluster system legally ties several properties together for treatment and dispersal of their wastewater. A cluster system is used only when lot size, lot location, and soils make other onsite wastewater treatment system alternatives unacceptable.

Maintenance and management

Different types of onsite wastewater treatment systems require different maintenance procedures. However, all systems need maintenance: Yours will malfunction if you do not maintain it. Follow the maintenance instructions provided for the equipment installed for your system.

These general tips can also help you keep your onsite wastewater treatment system operating:

- ✓ Do not treat an onsite wastewater treatment system as if it were a normal centralized sewer system. Items flushed down the toilet do not disappear. They must be

treated by the onsite wastewater treatment system.

- ✓ Do not use in-sink garbage grinders excessively or discard too much grease. Garbage grinders can cause sludge or scum to build up rapidly, making it necessary to clean the septic system more frequently and possibly causing it to malfunction because the wastewater is too strong for the system to handle.
- ✓ Do not use the toilet as a trash can. Do not dispose of cleaning tissues, cigarette butts, diapers, or other trash in the toilet. This wastes water and loads too many solids on the treatment system.
- ✓ Have the septic tank cleaned before sludge accumulates almost to the bottom of the tank's outlet device. If sludge or scum accumulates to this point, solids will leave the tank with the liquid and possibly clog the soil in the drain field. Sewage will then surface or back up into the house through the plumbing fixtures.
- ✓ Because it is impractical for an average homeowner to inspect a septic tank to see if it needs to be cleaned, establish a regular schedule of cleaning the septic tank every 2 to 3 years. Septic tank pumpers are equipped to clean septic tanks. Only people registered with the Texas Commission on Environmental Quality may pump and transport septic tank sludge.
- ✓ Do not build driveways, storage buildings, or other structures over the treatment works or its soil treatment area. These solid surfaces prevent access to the system for maintenance, reduce the ability of water to evaporate from the soil, and restrict air movement into the soil.
- ✓ Do not drive heavy equipment over the components of a wastewater treatment system. The equipment can crush them. The components are designed to support the soil over the top of the

system, not equipment driving over it.

- ✓ Natural bacteria are present in the wastewater to decompose the waste. Chemical additives are not necessary for a septic tank to operate. Some additives may even harm the tank's operation. Remember: The septic tank is supposed to collect solids. If you flush solids out of the tank and into the drain field by adding chemicals, the solids will plug the drain field, and you'll have to replace it.
- ✓ Soaps, detergents, bleaches, drain cleaners, and other household cleaning materials very seldom affect the operation of the system. However, use these materials in moderation. Excessive use of cleaning materials or using continuous disinfectants in the toilet bowl or disinfecting soaps and detergents may harm the microbes living in the onsite wastewater treatment system.
- ✓ If you have a water softener, do not send the back-flush water into the pretreatment component of your onsite wastewater treatment system.
- ✓ Do not come into contact with the liquid from the onsite wastewater treatment system. Nondisinfected wastewater may contain pathogens that could make you sick.
- ✓ Do not allow electrical service to be interrupted to an onsite wastewater treatment system that has mechanical components or alarms.
- ✓ Maintain a grass cover over the drain field. Plant warm-season grasses that use much water and overseed with cool-season grasses during the winter. Grasses remove a significant portion of the water, and the grass cover must be maintained. Trees also remove water and can be planted around the drain field.
- ✓ Divert away from the soil treatment area any rainwater com-

ing off driveways, other hard surfaces, and the roof. The soil treatment area is designed to manage a specific amount of water. Rainwater could fill the system, leaving no room for wastewater. Design landscaping to carry runoff water away from the soil treatment area.

- ✓ Excessive wastewater flows can overload the onsite wastewater treatment system. If you wash all your clothes on one day, you could overload the soil treatment area, causing water to pond on the ground surface. You also could flush water through the system, which can carry solids through the treatment device.
- ✓ Do not plumb the condensate drain from an air conditioning unit or commercial ice maker into the onsite wastewater treatment system. This extra water can overload the system.

Conserve water

You can greatly reduce the amount of water entering your onsite wastewater treatment system by adopting water conservation practices:

- ✓ Because showers usually use less water, take showers instead of baths. Install a water-saving shower head that uses less than 2.5 gallons of water per minute. This practice saves both water and the energy required for the extra hot water.
- ✓ If you take a bath, don't fill the tub as high as usual. A whirlpool bathtub requires much more water. If your home has a whirlpool tub, make sure your septic system can accept the additional wastewater.
- ✓ Repair leaky faucets and faulty toilet-filling mechanisms as quickly as possible.
- ✓ Check toilets for leaks that may not be apparent. To determine if there is a leak, add a few drops of food coloring or a leak detection tablet to the tank. Do not

flush. If color appears in the bowl within a few minutes, the toilet fill or ball-cock valve needs to be adjusted to prevent water from overflowing the stand pipe, or the flapper at the bottom of the toilet tank needs to be replaced.

- ✓ Reduce the amount of water used for flushing the toilet by installing a new toilet (1.6-gallon) or a toilet tank dam. Or you could fill plastic bottles with water, cap them and lower them into the tank of the existing 3.5 gallon or larger toilet. Do not use bricks, because they can crumble and damage the fixture. Make sure the toilet dam does not contact the moving parts in the toilet tank, because this may allow too much water to flow down the drain.
- ✓ Whenever possible, operate the dishwasher with a full load.

- ✓ Do not leave the water running continuously when brushing your teeth, washing your hands, rinsing kitchen utensils, or cleaning vegetables.
- ✓ Use faucet aerators that restrict the water flow to no more than 2.2 gallons per minute.
- ✓ Keep a container of drinking water in the refrigerator instead of running the faucet until the water turns cool.
- ✓ Insulate all hot-water pipes to avoid long delays of wasted water while waiting for heated water.
- ✓ Ask your city, county, or local government about their programs to conserve water and how they can help you save water.

Summary

Onsite wastewater treatment systems are a permanent solution to

our wastewater management needs. However, you cannot treat these systems as if you are connected to a centralized sewer because you do not have the averaging effect of being connected to a system with your neighbors.

- ✓ To achieve an average flow, change your personal habits that send too much water continually or on a single day.
- ✓ Or, install a system that can manage more wastewater.
- ✓ Remember that an onsite wastewater treatment system is designed to handle a specific volume of organic matter. Placing additional solids into the system can cause it to malfunction. Items flushed down the drain do not just disappear. The onsite wastewater treatment system must treat these items and distribute the water into the soil.

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Onsite wastewater treatment systems

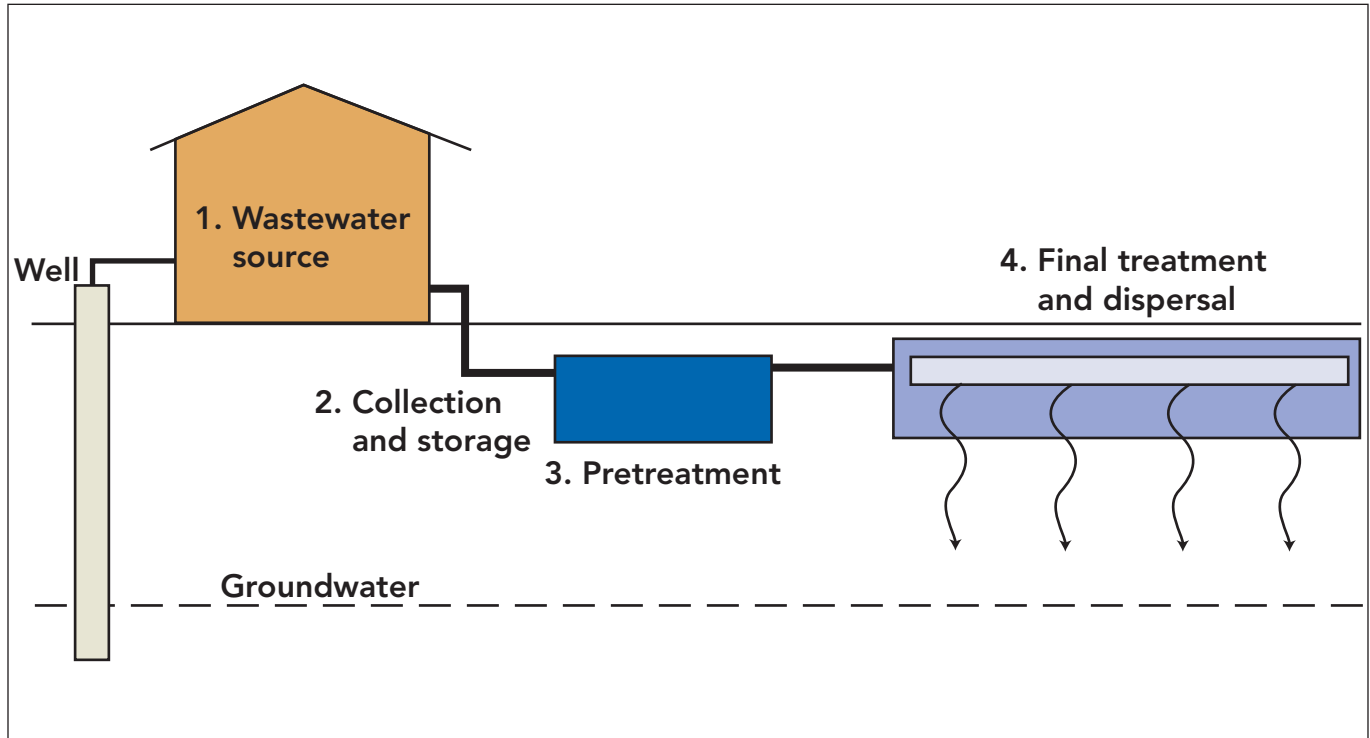


Figure 1: Components of an on-site wastewater treatment system.

Understanding and maintaining your septic system

Bruce J. Lesikar, Justin Mechell and Rachel Alexander
 Professor and Extension Agricultural Engineer, Extension Assistant,
 Texas Water Resources Institute Research Assistant
 The Texas A&M System

Proper operation and maintenance of your wastewater treatment system is critical for its performance. Taking proper care of your system also:

- ✓ Protects the health of the people living on and near your property,
- ✓ Helps safeguard your property values, and
- ✓ Helps preserve the quality of groundwater and prevents your sewage from degrading nearby waterways.

To understand how to operate and maintain onsite wastewater treatment systems, you should know how they work and what factors affect them. Figure 1 illustrates the four components of an onsite wastewater treatment system: wastewater source; collection and storage; pretreatment

components; and final treatment and dispersal components.

Wastewater source

The wastewater source is the domestic wastewater from homes, schools, or businesses that the treatment system serves. The constituents and strength of wastewater, which is 99.9 percent water, can vary by source. Domestic wastewater is water discharged from plumbing fixtures, appliances, toilets, bath, laundry

and dishwashers. Owners of onsite wastewater treatment systems should understand that anything they put in their sinks or drains may pass through their system and into their groundwater and surface water supplies.

Collection and storage

The collection component of a residential system is generally a solid, rigid pipe that collects wastewater from plumbing fixtures and appliances. This pipe, laid at a downward slope of no less than 1 percent ($\frac{1}{8}$ inch drop per foot of pipe), exits the structure and extends to the pretreatment component.

Some sites may have alternative collection systems. These systems may have pump tanks to collect the waste and subsequent lines to transport it to the pretreatment components.

Pretreatment components

Pretreatment components remove many of the contaminants from the wastewater to prepare it for final treatment and dispersal into the environment. Contaminants in the wastewater include harmful bacteria that can cause illness, as well as nitrogen and phosphorus that can stimulate algae growth in water bodies. The level of treatment is selected to match the receiving environment and the intended use of the effluent. The quantity of contaminants must be reduced to a level the soil can accept and treat.

Wastewater pretreatment components include septic tanks, trash tanks, grease traps, and processing tanks. Aerobic treatment units, media filters, and constructed wetlands are advanced pretreatment components. Homeowners have several options when selecting a system for pretreating wastewater before it is dispersed to the environment.

If your home has more than two showers, a multi-head shower, a whirlpool tub, or multiple laun-

dry rooms, or if you generate lots of wastewater in other ways, you will probably need to install a flow equalization tank. This tank collects wastewater and controls its flow to the pretreatment component, which allows the onsite wastewater treatment system to accept and treat wastewater as it is generated. Without a flow equalization tank, you must modify your lifestyle to match the capacity of the treatment system.

Final treatment and dispersal components

Final treatment and dispersal components are the last step in removing contaminants and dispersing the treated wastewater into the environment. Several options help with distributing wastewater in soil.

Gravity flow systems are the most widely used and least expensive, and they require the least amount of operation and maintenance.

Pressurized distribution methods overcome various site limitations. Low-pressure, subsurface drip, and spray dispersal systems are designed to function in difficult areas. Because they are pressurized, they evenly distribute wastewater. Such systems also facilitate the reuse of wastewater in the landscape. These advantages, however, increase the operation and maintenance requirements.

System maintenance

Onsite wastewater treatment systems come in many types and sizes. When a house is being planned, the size of its onsite wastewater treatment system is based on the following:

- ✓ Number of bedrooms and square footage of the house
- ✓ Whether water-conserving fixtures will be used
- ✓ Overall site and soil considerations

The most appropriate system is one that will handle the greatest volume and strength (concentration of contaminants) of wastewater for that size of house.

Your water use habits affect how well your wastewater treatment system works. If you use more water than average for the size of your house, your system can be overloaded with water and may malfunction. If you want to be able to use more water than average, you may need to install a larger than minimum size system.

Your wastewater will be stronger than average if you use a garbage disposal or operate a bakery or daycare facility at home. The wastewater may need additional treatment (such as with an aerobic treatment unit, media filter, or trickling filter) to bring it back to an average strength or remove most of the contaminants.

The site itself is also a factor. An onsite wastewater treatment system is a no-discharge system, which means that the wastewater must stay on the property where it is generated. All contaminants must be removed from the wastewater before it moves through the soil to groundwater.

The site for your system must have adequate soil to allow for the proper distribution and subsequent dispersal of effluent from your system. If you have poor or shallow soil, a conventional wastewater treatment system will not adequately treat the wastewater. This often occurs with sites that have shallow soils located over fractured rock, Karst limestone, or gravelly sand. In this case, your wastewater needs additional treatment before it is applied to the soil. If the wastewater is not treated adequately before it reaches groundwater, your water well can become contaminated.

It is best to follow the maintenance instructions for your system. The following general tips can also help you keep your onsite wastewater treatment system operating efficiently and trouble-free.

Wastewater source

- ✓ Do not treat an onsite wastewater treatment system as if it were a normal centralized sewer system. Items flushed down the toilet

do not disappear. They must be treated by the onsite wastewater treatment system.

- ✓ Leaking toilets and dripping faucets should be fixed immediately. If such problems persist, your wastewater treatment system could be hydraulically overloaded.
- ✓ Do not use in-sink garbage grinders excessively or discard too much grease. Garbage grinders can cause sludge or scum to build up rapidly. This makes it necessary to clean the septic system more frequently and might cause it to malfunction because the wastewater is too strong for the system to handle.
- ✓ Do not dispose of cleaning tissues, cigarette butts, diapers, or other trash in the toilet. This wastes water and loads too many solids into the treatment system.
- ✓ Soaps, detergents, bleaches, and other household cleaning materials seldomly affect the operation of the system. However, use them in moderation. Excessive use of cleaning materials, disinfecting or antimicrobial soaps, and detergents, or using continuous disinfectants in the toilet bowl, may leave wastewater untreated by killing the microbes in the onsite wastewater treatment system.
- ✓ Excessive wastewater flows can overload the onsite wastewater treatment system. If you wash all your clothes on one day, you could overload the soil treatment area. This causes water to pond on the ground surface. You could also flush water through the system, which can carry solids through the pretreatment component.

Plumbing and electrical considerations

- ✓ If you have a water softener, consider plumbing the flushwater around the pretreatment component. Send it directly to the final

treatment and dispersal component of your onsite wastewater treatment system.

- ✓ Consider plumbing the condensate drain from an air conditioning unit or commercial ice maker to a graywater system rather than to the onsite wastewater treatment system. This extra water can overload the system.
- ✓ Do not intentionally turn off electrical power to an onsite wastewater treatment system that has mechanical components or alarms. For example, do not turn off the power when away on vacation. Sewage that collects when the power is off has not been treated and may be dispersed when power is restarted.

Pretreatment, final treatment and dispersal

- ✓ Natural bacteria in the wastewater decompose the waste. Chemical additives are not necessary for a septic tank to operate. Some additives may even harm the tank's operation. Remember that the septic tank is supposed to collect solids. If you flush solids out of the tank and into the final treatment and dispersal component by adding chemicals, the solids will plug the soil. Then you'll have to replace the soil treatment component, usually the most expensive part of a system.
- ✓ Have the septic tank cleaned before sludge or scum accumulates to the bottom of the tank's outlet device (about every 2 to 3 years). If too much sludge accumulates, solids will leave the tank with the liquid and possibly clog the soil. Sewage will then surface or back up into the house through the plumbing fixtures.
- ✓ Do not build driveways, storage buildings, or other structures over the pretreatment or final treatment and dispersal components. These solid surfaces prevent access to the system for

maintenance, reduce the ability of water to evaporate from the soil and restrict air movement into the soil.

- ✓ Do not drive heavy equipment over the components of a wastewater treatment system. The equipment can crush them. The components are designed to support the soil over the top of the system—not equipment driving over it.
- ✓ Maintain a grass cover over the final treatment and dispersal component. Plant warm-season grasses that use more water and over-seed with cool-season grasses during the winter. Grasses remove a significant portion of the water from a system, and the grass cover must be maintained. Trees also remove water and can be planted around the system perimeter. However, roots from trees planted too close to the soil treatment area can clog distribution pipes.
- ✓ Divert any rainwater running off driveways, the roof and other hard surfaces away from the soil treatment area of the final treatment and dispersal component. The soil treatment area is designed to manage a specific amount of water. Rainwater could fill the system, leaving no room for wastewater. Design landscaping to carry runoff water around the soil treatment area.

Health considerations

- ✓ Maintain the disinfection component of your system. Add the appropriate chlorine product to chlorinators. Replace the UV lamp, as necessary, in UV disinfection systems.
- ✓ Do not come into contact with the liquid from the onsite wastewater treatment system. Even wastewater that has been through a disinfection component may contain pathogens that could make you sick. Some pathogens are resistant to chlorine disinfection.

- ✓ If your system malfunctions or wastewater seeps or ponds on the land surface, immediately seek professional assistance from a licensed wastewater practitioner to eliminate the health hazard.

You are responsible for maintaining your system. You may wish to hire a professional to make sure your system continues to function properly. Having a service contract with an expert on the operation and maintenance of onsite wastewater treatment technologies is a sound and economical approach to properly maintaining and extending the life of your system.

When a professional is making regular service visits, problems are usually detected before they can cause your system to malfunction. Early detection makes it possible to take remedial action before a system becomes a health hazard to you or the public, harms the environment,

or becomes a legal liability. Repair all problems quickly. (Common repairs are replacing the air compressor, pumps, and spray heads and pumping the tank.) Failure to take care of problems when they occur can cause other parts of the system to malfunction. A system with one malfunctioning part is a malfunctioning system.

Some localities have regulations that require a certain amount of system management. Even if they are not required in your area, routine inspection and proper system maintenance will ensure that onsite wastewater treatment systems will continue to be a permanent and effective part of our wastewater treatment infrastructure.

For more information

The selection of an onsite wastewater treatment system should be based on your local conditions. Contact your local permitting author-

ity for information about appropriate technologies in your area. A wastewater professional can also provide information on technologies used in your area.

Additional information can be obtained by visiting the following Web sites:

Texas Commission on Environmental Quality

<http://www.tceq.state.tx.us/>

Texas AgriLife Extension Service

<http://texaswater.tamu.edu/>

Department of State Health Services

<http://www.dshs.state.tx.us/>

Acknowledgments

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Exhibit 2 - 2014 Quarterly Meeting Agenda

Geronimo and Alligator Creeks Watershed

Partnership Meeting

6 pm Tuesday, January 14, 2014
GBRA River Annex

Welcome and Introductions

- Debbie Magin, GBRA

Texas Parks & Wildlife Department Mussel Watch Program

- Marsha May, Texas Parks & Wildlife Department

Latest Water Quality Data Summary of Geronimo Creek

- Lee Gudgell, GBRA

Isotope Study on Origin of Nitrates in Groundwater

- Rebecca Lambert, United States Geological Survey

Planning discussion for the 2014 Creek Cleanup Event

Implementation Updates and Announcements

- Feral Hog Workshop, May 23 at The Big Red Barn
- Nonpoint Education for Municipal Officials Workshop March 25th



Exhibit 3 - Paid Ad/Articles

Geronimo & Alligator Creek



Let's work together to protect Geronimo and Alligator Creeks

The Geronimo and Alligator Creeks Project

By Ward Ling, Geronimo and Alligator Creeks Watershed Coordinator

According to the Texas Commission on Environmental Quality (TCEQ) water quality in almost half of the streams, rivers, and lakes in Texas is "impaired".

An impaired waterbody has pollutant levels above established standards that limit important uses such as recreation and fishing, or that may be harmful to aquatic life. Unfortunately, two local waterbodies are impaired, Geronimo Creek and Alligator Creek. Both creeks have elevated concentrations of E.coli bacteria which create risks for any type of contact recreation that might result in ingestion of water, such as wading and swimming. Monitoring also has found elevated levels of nitrate-nitrogen which can contribute to algal blooms and ultimately, to fish kills.

Fortunately, in 2009 a group of local citizens formed the Geronimo and Alligator Creeks Watershed Partnership. And working together and with state and federal agency support, the Partnership developed the Geronimo and Alligator Creeks Watershed Protection Plan (WPP). The plan identifies potential sources of pollution and provides a basic strategy to restore and protect water quality in Geronimo and Alligator Creeks. The plan and information about on-going activities in the watershed can be found on the Partnership's website at <http://geronimocreek.org>.

Plan Development

The Geronimo and Alligator Creeks WPP was developed by and for local citizens with extensive stakeholder input throughout the process. Two public information meetings were held in 2009 to form the Partnership and organize a 25 member Steering Committee. Over the next 29 months, the plan was developed through 12 Steering Committee meetings, 2 watershed tours, 9 work group meetings, and 2 public comment meetings. All meetings were advertised and the public was encouraged to participate. Texas A&M AgriLife Extension Service and the Guadalupe-Blanco River Authority helped the Partnership prepare the plan with funding from the Texas State Soil and Water Conservation Board.

The Geronimo and Alligator Creeks WPP was completed and approved by the Steering Committee in August 2012, and was officially "accepted" by the Environmental Protection Agency on September 13, 2012. EPA acceptance is critical because it allows the watershed to receive special federal funding to support plan implementation.

What Has Happened So Far

Since fall of 2012, implementation of the WPP has been actively underway. All implementation activities are voluntary, so individuals and businesses can identify actions that fit them best. In many cases, simple changes in habits or actions, when adopted by everyone involved, can make a big difference.

One great example of community action was the first Annual Geronimo Stream Cleanup on April 6, 2013. Over 100 local groups and citizens participated. Volunteers collected 2,960 pounds of refuse including 110 bags of trash, 26 tires, and large items such as stoves, air conditioners, and car batteries.

For some efforts, funding is essential. And already, the Partnership has obtained over \$748,000 in state and federal funding to help the watershed. These funds are targeting specific needs such as removing failed septic systems, helping farmers and ranchers implement water quality practices, and eliminating feral hogs. More information about these efforts will be in future articles.

Getting Involved

Public involvement is essential to improve and protect water quality in Geronimo and Alligator Creeks. The "public" includes every individual citizen, landowners, businesses, and city and county officials. And to get more people involved, we will be publishing monthly articles in the Seguin Gazette and New Braunfels Herald-Zeitung. The purpose is to provide information about the watershed, on-going activities, and recommendations on how to better manage potential sources of bacteria and nutrients. When you see these articles, pass them on to friends and neighbors.

One of the best ways for you to get involved is by becoming an active member of the watershed Partnership and participating in quarterly Partnership meetings. These meetings provide important updates on current activities and offer great opportunities to share ideas for improving water quality in the watershed. The next partnership meeting is scheduled for January 14, 2014 at the GBRA River Annex, 905 Nolan Street, in Seguin starting at 5:30 pm. In the meantime, you can contact me, Ward Ling (Project Manager) at 979-845-6980 or by e-mail at wling@ag.tamu.edu or Debbie Magin, Director of Water Quality Services/Regional Laboratory at 830-379-5822 or dmagin@gbra.org. And don't forget to visit the watershed's webpage at <http://www.geronimocreek.org/> to learn more.

Remember, your watershed is counting on you. Let's work together to protect Geronimo and Alligator Creeks and all your local water resources.

Let's work together to protect Geronimo and Alligator Creeks
using vegetated filter strips

According to the Texas Commission on Environmental Quality (TCEQ) water quality in almost half of the streams, rivers, and lakes in Texas is "impaired". An impaired waterbody has pollutant levels above established standards that limit important uses such as recreation and fishing, or that may be harmful to aquatic life. Unfortunately, two local waterbodies are impaired, Geronimo Creek and Alligator Creek. Both creeks have elevated concentrations of *E.coli* bacteria which create risks for any type of contact recreation that might result in ingestion of water, such as wading and swimming. Monitoring also has found elevated levels of nitrate-nitrogen which can contribute to algal blooms and ultimately, to fish kills.

Fortunately, in 2009 a group of local citizens formed the Geronimo and Alligator Creeks Watershed Partnership. And working together and with state and federal agency support, the Partnership developed the Geronimo and Alligator Creeks Watershed Protection Plan (WPP). The plan identifies potential sources of pollution and provides a basic strategy to restore and protect water quality in Geronimo and Alligator Creeks. The plan and information about on-going activities in the watershed can be found on the Partnership's website at <http://geronimocreek.org>.

To inform the public about practices they can adopt to improve and protect water quality, the Partnership is producing monthly news articles. This month we are focusing on filter strips for agricultural land.

A filter strip is a vegetated buffer positioned between potential contamination sources and a body of water such as a creek, stream, or river (either flowing or typically dry), or a pond or lake. The purpose of a filter strip is to reduce concentrations of pollutants in rainfall runoff. They are effective in limiting the transport of suspended sediment, nutrients, bacteria, and pesticides to adjacent waterways. Filter strips can be installed down slope from field crops, pastureland, livestock pens, equipment and chemical storage areas, and other land areas from which pollutants might originate.

Filter strips reduce contamination of surface water through a variety of mechanisms. As runoff enters the filter strip, velocity decreases allowing suspended sediment to settle out. Some nutrients and pesticides bound to soil particles are removed in this manner. Since more water infiltrates into the soil, dissolved contaminants also are removed. Captured nutrients are utilized by the filter vegetation, while pesticides and other organics are degraded through natural processes.

Slope, soil texture, vegetation, and the flow distribution of runoff all should be considered when siting and designing a filter strip. Slope length and steepness directly affect runoff velocity, and thus infiltration rate. Gently sloping areas are ideal, however, sites with slopes greater than 5%, can be used effectively with proper design. Generally, as slope increases, the width of the filter strip should increase. While there is no minimum or maximum, filter strips often range in width from 25 to 50 feet for slopes between 1-10%.

Soil texture also influences infiltration rate, and soils with greater clay content typically require a wider filter strip to achieve the same amount of pollutant removal compared to sandy soils. Non-woody

species native to the region should be used, but also must be tolerant to any herbicides that may be present in the runoff. Plantings can be a single species or a mixture, but should provide a solid plant cover.

Contaminant removal efficiencies vary based on the characteristics of a given runoff event and the pollutants of concern. Filter strips should be constructed to maintain uniform flow across the width of the strip and limit channelized flow. Removal of pollutants that are dissolved in runoff typically requires a greater filter strip width to achieve desired reductions.

The United States Department of Agriculture Natural Resources Conservation Service (NRCS) and the Texas State Soil and Water Conservation Board (TSSWCB) both offer technical and financial incentives for installation of conservation practices, including filter strips. For information regarding NRCS programs visit www.nrcs.usda.gov. or contact your local USDA-NRCS representative, Bill Finch at 830-379-0930 or william.finch@tx.usda.gov For assistance through TSSWCB programs contact the Comal-Guadalupe SWCD at comalguadalupeswcd@tx.nacdnet.org.

For more information on assistance opportunities in your area, contact your Texas A&M AgriLife County Extension Agent in Guadalupe (830) 379-1972 or Comal Counties (830) 620-3440.

Let's work together to protect Geronimo and Alligator Creeks...
through proper septic system maintenance

According to the Texas Commission on Environmental Quality (TCEQ) water quality in almost half of the streams, rivers, and lakes in Texas is "impaired". An impaired waterbody has pollutant levels above established standards that limit important uses such as recreation and fishing, or that may be harmful to aquatic life. Unfortunately, two local waterbodies are impaired, Geronimo Creek and Alligator Creek. Both creeks have elevated concentrations of *E.coli* bacteria which create risks for any type of contact recreation that might result in ingestion of water, such as wading and swimming. Monitoring also has found elevated levels of a nutrient, nitrate-nitrogen, which can contribute to algal blooms and ultimately, to fish kills.

Fortunately, in 2009 a group of local citizens formed the Geronimo and Alligator Creeks Watershed Partnership. Working together and with state and federal agency support, the Partnership developed the Geronimo and Alligator Creeks Watershed Protection Plan (WPP). The plan identifies potential sources of pollution and provides a basic strategy to restore and protect water quality in Geronimo and Alligator Creeks. The plan and information about on-going activities in the watershed can be found on the Partnership's website at <http://geronimocreek.org>.

The next [Partnership meeting](#) is at 6pm, Tuesday, January 14th at the Guadalupe-Blanco River Authority (GBRA) River Annex at 905 Nolan Street in Seguin. We will discuss the latest implementation updates and begin planning activities for 2014. Also, the Partnership is producing monthly news articles where we inform the public about practices they can adopt to improve and protect water quality. With the Christmas season here and guests coming to visit, in this month's article we discuss the benefits of properly maintaining your septic system.

Proper operation and maintenance of your septic system is critical for its performance. Taking care of your system also protects the health of people living on and near your property, and helps safeguard your property values. Attention to system operation helps preserve the quality of groundwater and prevents your sewage from degrading nearby waterways.

Different types of septic systems require different maintenance procedures. Conventional systems are the most common and consist of a septic tank and a drain field. Aerobic systems are more complex will have two or more tanks, an air pump, a disinfection system, and spray heads. However, all systems need maintenance, and yours will not continue to function properly if you neglect it. The following are some general tips:

- Do not discard too much grease down the drain or use in-sink garbage disposals excessively. Both of these practices can increase the maintenance interval schedule.
- Do not use the toilet as a trash can. Do not dispose of paper towels, cigarette butts, diapers, or other trash in the toilet. Besides wasting water, these solids will not break down.

- Do not use swimming pool chlorine tablets in the disinfection system that is part of aerobic systems. They do not disinfect, can create a danger of explosion, and are not approved by EPA.
- Establish a regular schedule for having the tank cleaned out (pumped). This will prevent backups from occurring at the most inopportune times, such as when a system experiences an overload due to out-of-town guests.
- Protect the drain field of a conventional system and the spray heads and surrounding area of an aerobic system. Do not use the drain field or spray area as a parking area, basketball court, or place to build a storage shed or other structures. The extra weight can damage subsurface structures, as well as, prevent the system from functioning as it was designed.
- Chemical additives advertised to enhance system function are not necessary for a septic system. These products are literally money down the drain.
- Soaps, detergents, bleaches, drain cleaners, and other household cleaning chemicals used in moderation very seldom affect the operation of the system. However, excessive use of these chemicals may harm the beneficial microbes in the system.
- Excessive wastewater flows can overload the septic system, such as washing multiple loads of laundry in one day. Try to spread out the loads over several days. Avoid frequent draining of “garden tubs”, hot tubs, and large whirlpool tubs that enter the septic system.
- Install water conserving appliances such as low flow shower heads that use less than 2.5 gallons per minute, 1.6 gallon or less per flush toilets, and faucet aerators that restrict water flow to no more than 2.2 gallons per minute. Don’t use more water than needed for showering or bathing.
- Conserve your water resources. Whenever possible, operate the dishwasher with a full load, turn off the water when brushing teeth, and repair or replace leaking plumbing fixtures.

One major health concern that can be caused by septic system malfunction is bacteria in your private water well. The GBRA laboratory in Seguin can analyze your well water for bacteria for as little as \$22/sample, in addition to many other types of water tests. Go to <http://www.gbra.org/lab/privatewells.aspx> for more information on how to test your well water.

Other visible signs of potential system malfunction may include water surfacing on the drain field, excessive odors around the septic system, or slow draining or backed up sinks, tubs, or toilets. Neglecting your system will potentially result in loss of system function, increased repair costs, increased health risks, and a greater impact to the environment. If you suspect you have a problem, contact a septic system service provider as soon as possible.

Homeowner Septic System Maintenance classes are scheduled for April 28th and 29th. The classes are free, but you need to register to reserve your spot. The class on the 28th is a 2 hour general class from 6-8 pm in Seguin and the class on the 29th is a 6 hour class focused on aerobic

systems from 8:30 am-3:30 pm in New Braunfels. For more information, contact Ward Ling at 979-845-6980 or wling@ag.tamu.edu or go to the project webpage www.geronimocreek.org

Exhibit 4 - The Geronimo Flow, Vol. 3

The Geronimo Flow

November 2013



Your Newsletter

The Geronimo and Alligator Creeks Watershed Partnership was formed in 2010 to restore and protect water quality in the Geronimo and Alligator Creeks Watershed due to elevated levels of bacteria and nitrate-nitrogen. The Partnership completed a Watershed Protection Plan in 2012 and is now working toward full

implementation. The purpose of this newsletter is to inform and engage local stakeholders in helping to improve and protect the quality of water in Geronimo and Alligator Creeks. For more information about the project visit our website: www.geronimocreek.org

In this issue:

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<i>City of Seguin Grant</i>	<i>pg 2</i>
<i>SWCD Grant</i>	<i>pg 3</i>
<i>Feral Hog Workshop</i>	<i>pg 3</i>
<i>Newspaper Articles</i>	<i>pg 4</i>
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<i>Proposition 6</i>	<i>pg 5</i>
<i>Next Meeting</i>	<i>pg 7</i>

1st Year Implementation Highlights

On September 13, 2012 EPA accepted the Geronimo and Alligator Creeks Watershed Protection Plan. Since that time, implementation of the WPP has taken off. Here are some of the highlights of the first year:

- The first annual Creek Cleanup Event in April 2013 resulted in 100 volunteers removing nearly 3,000 pounds of debris from the creeks. Next year's event is promising to involve more volunteers and clean up a larger area.
- Grant was awarded to the City of Seguin to help homeowners in Oak Village North decommission septic systems in an area adjacent to Geronimo Creek. This will reduce potential bacteria and nutrient loading to the creeks from failing systems in the neighborhood. (See pg. 2 of the newsletter.)
- Grant award to the Comal-Guadalupe SWCD to employ a district technician to assist farmers and ranchers with development of Water Quality Management Plans for their operations. These site specific plans reduce or eliminate nonpoint source pollution from these operations. (See page 3 of the newsletter.)



The OVN project will decommission approximately 150 septic systems.



Volunteers unloading trash removed from the creeks during the first annual Creek Cleanup Event.

- Seguin High School's Project Based Learning Academy focused on Geronimo Creek and developed fun and informational placemats, brochures, and stickers that were distributed to local restaurants to spread the word about the project.
- A Texas Well Owner Network Workshop was hosted by GBRA and educated 48 private water well owners on how to protect their drinking water supplies.
- A Texas Riparian and Stream Ecosystem Workshop was held to explain the value and natural function of riparian zones, which included a tour to Geronimo Creek at the Seguin Outdoor Learning Center.
- AgriLife Extension conducted a 40 Gallon Challenge Event, a Range and Wildlife Field Day, spring and fall Weed and Brush Control Workshops, a Brush and Forage Conference, a Water Fair for elementary school children, and Nutrient Management workshops.

Quarterly Partnership meetings are opportunities to hear updates on implementation activities and to provide input to the process. Please take advantage of these meetings and get involved!

City of Seguin Receives Grant Award

The City of Seguin recently received a grant award from the Texas Commission on Environmental Quality to help homeowners in Oak Village North (OVN) decommission their septic systems. Homeowners will transition from their septic systems to a new sanitary sewer collection line that is being extended to the neighborhood. Many OVN homeowners have experienced recurring failures of their septic systems due to system age, poor soil suitability, a seasonally high water table, and other factors.

Decommissioning abandoned septic systems is required by state law. The process requires the contents of the tank to be pumped out, and the tank to then be filled to ground level with

fill material.

Failing septic systems were identified as potential sources of bacteria and nutrient loading to the creeks during development of the Geronimo and Alligator Creeks WPP.

The City of Seguin began work on the OVN sewer project in 2012 as part of an agreement when the city annexed the area.

Homeowners in the OVN subdivision will continue to receive construction project updates and information from the City of Seguin through the biweekly newsletter the city has been providing since the project was initiated.

Comal-Guadalupe SWCD Receives Grant Award

The Comal-Guadalupe Soil and Water Conservation District (SWCD) was awarded a grant from the Texas State Soil and Water Conservation Board to hire a district technician who will assist farmers and ranchers in developing Water Quality Management Plans for their individual operations. The grant also provides funding for over \$150,000 in financial incentives to help producers implement approved practices.

Nutrient and bacteria loading from agricultural operations are identified in the Geronimo and Alligator Creeks WPP as potential sources of pollution in area creeks. A site specific WQMP is developed by working with a land owner to identify, design, and implement practices that will protect water resources. The plan includes appropriate land treatment practices, production practices, management measures and technologies.

Examples of key practices include

prescribed grazing, fencing, watering facilities, pipelines, wells, grassed waterways, pasture/hayland/rangeland planting, riparian buffers, filter strips, and a few others.

There is no cost to the landowner for development of the WQMP. However, there may be costs for implementing certain practices, but financial assistance is available in most cases.

The district is currently accepting applications for the district technician position through November 25, 2013. Please contact Beverly Hartwick at 830-379-0930 ext 3 for more information.

For more information, contact the Comal-Guadalupe SWCD at comalguadalupeswcd@tx.nacdnet.org or your local Texas State Soil and Water Conservation Board Field Representative, Tony Franklin at tfranklin@tsswcb.state.tx.us

Feral Hog Workshop Coming Spring 2014



Whether you reside in a suburban neighborhood or on a tract of land outside of town, feral hogs can affect you. Feral hogs are an exotic invasive species that threaten both land and water resources throughout the state.

“Evidence of feral hog activity is observed frequently in many watersheds throughout Texas” Jared Timmons, Texas A&M AgriLife Extension Agent at San Marcos said. “At least 134 million acres in Texas

have the potential to be impacted by an estimated 2.6 million feral hogs.”

Residents of Guadalupe, Comal, and surrounding counties are invited to attend the first feral hog workshop offered in the Geronimo and Alligator Creeks watershed. The workshop is tentatively planned for May 23, 2014, so please pencil this into your schedule.

The workshop will feature speakers from multiple state agencies along with wildlife specialists from Texas A&M AgriLife Extension. Topics to be discussed include: Basic Biology of Feral Hogs and their Implications to the Watershed, Population Dynamics of Feral Hogs, Texas Laws and Regulations for Hunting Feral Hogs, Water Quality in

A watershed protection plan (WPP) is a comprehensive management plan developed by local citizens to resolve complex water quality problems.

Do you have something you would like to contribute to the newsletter? Or, would you like to see us provide information on a particular topic? Suggestions can be sent to Ward Ling at wling@ag.tamu.edu or call 979-255-1819.

Southeast Texas, Agricultural Regulations Regarding Feral Hogs, Feral Hog Control, Feral Hog Safety and Disease Concerns, and Movement of Feral Hogs in Texas.



Attendees will learn how they can help reduce the negative impacts of feral hogs, and about regulations designed to protect humans and other animals from potential disease concerns.

Program attendees will earn a total of 5 hours of CEU Credits; two hours in Integrated Pest Management, one hour in Laws and Regulations and two hours in general.

The workshop will be sponsored by Texas A&M AgriLife Extension, GBRA, and the Texas State Soil and Water Conservation Board.

For more information about the program, please contact Jared Timmons at the Texas A&M AgriLife Extension Service at:

254-485-4886

jbtimmons@ag.tamu.edu

Newspaper Articles

In our continuing effort to increase public awareness and involvement in implementing the Geronimo and Alligator Creeks WPP, we began publishing monthly educational articles in the Seguin Gazette and New Braunfels Herald-Zeitung last month. With special funding from the Texas State Soil and Water Conservation Board, the plan is to provide local readers with information about the watershed and water quality concerns, and

recommendations on how to better manage potential sources of pollution such as bacteria and nutrients. Articles will cover all three potential pollution source categories: urban, agriculture, and wastewater nonpoint sources. Through this process, we hope to reach and engage a broader audience across the watershed.

When you see these news articles, please be sure to pass them on to friends and neighbors!

Septic System Workshops

The first round of Homeowner Maintenance Septic System workshops on November 12th and 13th resulted in over 40 attendees learning about septic system operation and maintenance procedures. Feedback at the workshops indicated the need for a more comprehensive course. We are making plans to offer a 6 hour course in the spring of 2014 focused upon aerobic system maintenance and

operation. Watch for email notices after the holidays announcing these new classes.

Also, with the holiday season fast approaching, now might be a good time to schedule an inspection or have your system pumped out if it hasn't been done in the past 3 or 4 years. With holiday parties and out-of-town guests, septic systems can experience overload and can fail at the most inconvenient times.



Pumping out a septic tank should be a regular part of your maintenance activities.



Upcoming events

- *Partnership Meeting January 14, 2014 at the GBRA River Annex at 905 Nolan Street, Seguin.*
- *Nonpoint Source Education for Municipal Officials (NEMO) Workshop coming in Spring 2014—details coming soon!*
- *First Feral Hog Workshop in the Alligator and Geronimo Creeks Watershed May 23, 2014*

Nonpoint source pollution is the leading cause of water quality problems, according to the EPA.

Voters went to the polls last month and approved Proposition 6. The following is a brief overview of what it means to Texans, taken from the Texas Water Development Board website.

What is Proposition 6?

Proposition 6 creates and constitutionally dedicates two new funds: the State Water Implementation Fund for Texas (SWIFT) and the State Water Implementation Revenue Fund for Texas (SWIRFT).

Where will the money come from?

When voters approved Proposition 6, the legislature authorized a one-time, \$2 billion investment from the Economic Stabilization Fund (also known as the Rainy Day Fund) to the SWIFT. These funds are designed to make the financing of water projects more affordable and to provide consistent, ongoing state financial assistance for water supplies.

What will this program do for Texas?

The funds created through Proposition 6 will help communities develop and optimize water supplies at cost-effective interest rates. The upfront costs on water infrastructure can often make it difficult for some communities to build what they need. The SWIFT provides the economic opportunity for communities to overcome this hurdle by providing low-cost, flexible financing options for water projects. This financial assistance will enable local communities to begin needed water projects.

How would the program be used to ensure adequate water supplies?

The funds will be used to provide low-cost financing for projects in the

state water plan—a plan created by local and regional entities, with the assistance of the state, to meet future water demands. Every five years, 16 regional water planning groups assess the projected population and water demands and supplies in their areas over the next 50 years. Each region then compiles a regional water plan, and those plans are rolled up into the state water plan. The state water plan also includes important information on statewide trends and policy issues, and it lists the water supply strategies identified to meet the regional water shortages over the next 50 years.

The 2012 State Water Plan contains numerous strategies to meet water needs during drought. Those strategies are the water supply projects that would be eligible for funding through the SWIFT and SWIRFT.

Is my community represented in the state water plan?

Yes. Every community and every water user group in Texas is planned for. Water user groups include cities, rural water users, agriculture, livestock, manufacturers, mining, and steam-electric power. The 2012 State Water Plan addresses the needs of roughly 3,000 water user groups.

How does Proposition 6 help rural communities and Texas farmers?

Rural and agricultural stakeholders serve as part of the water planning process. This process identifies water supply projects that go into the state water plan. TWDB's planning process helps identify water projects that are needed by

rural and agricultural interests. Moreover, the legislature made serving these interests a priority: directing the TWDB to undertake applying not less than 10 percent of the funds to projects serving rural communities and Texas farmers.

What water supply projects would be supported by these funds?

Projects in the state water plan would be eligible for support from the SWIFT and SWIRFT. These water projects range from conservation and reuse, to desalting groundwater and seawater, to building new pipelines and developing reservoirs and well fields, and include many other kinds of projects as well. Through the regional water planning process, local and regional water experts recommended these projects as the most efficient and viable ones for their communities.

How does this program support water conservation?

The legislature has recognized the importance of water conservation and reuse strategies in managing and protecting the state's water resources. The legislature directed the TWDB to undertake applying not less than 20 percent of SWIFT financial assistance for water conservation and reuse projects. The TWDB is also directed to undertake applying an additional 10 percent for projects to serve rural areas, including agricultural conservation projects. Emphasizing the importance of conservation will help ensure communities use their water wisely and extend the life of their current supplies.

Could these funds be used to

build reservoirs?

Since all water supply projects in the state water plan will be eligible, reservoirs will be eligible for support from the SWIFT and SWIRFT if they are strategies in the state water plan. Reservoirs make up approximately 15 percent of the total financial assistance requested in the 2012 State Water Plan.

How will the funds be disbursed?

Communities and utilities will apply to TWDB for financial assistance, and funds will be disbursed for projects in the state water plan. The TWDB will evaluate and prioritize projects for assistance based on a state and regional process. Many factors will be considered in this evaluation, including the number of people served, the urgency of the project, the ability of the local and regional sponsors to support the project, and the degree of conservation achieved—just to name a few prioritization criteria.

How would the SWIFT and SWIRFT work?

The SWIFT allows for more cost-effective water projects, ultimately saving Texas and Texans money on water. Money in the SWIFT may be used to provide financial assistance for state water plan projects through the following TWDB programs: the Rural Water Assistance Fund, the Water Infrastructure Fund, State Participation, and the Agricultural Water Conservation Fund, as well as the proposed SWIRFT. The SWIFT can support low-cost financing for projects in the form of reduced interest rates, longer repayment terms, and deferred repayment periods of interest and

This publication was developed with funding support from the U.S. Environmental Protection Agency through a Clean Water Act §319(h) Nonpoint Source grant administered by the Texas State Soil and Water Conservation Board

principal.

Will this program affect groundwater rights?

No. The SWIFT will not affect groundwater rights or other private property rights in any way. Further, the SWIFT will not affect how groundwater conservation districts manage local groundwater supplies.

Will this program change how surface water is regulated?

No. Surface water (water from lakes and rivers) is governed by an entirely separate set of statutes that will not be affected by this program.

Who benefits from this program?

Texas. Cities, counties, water districts, river authorities, irrigation districts, regional water authorities, and nonprofit water supply corporations across this state are all eligible to use TWDB's financial assistance programs to address implementation of state water plan projects.

For more information, go to:
<http://www.twdb.state.tx.us/news/media/swift/faq.asp>

Next Partnership Meeting

The Geronimo and Alligator Creeks Watershed Partnership will meet on January 14th in the GBRA River Annex in Seguin. Partnership meetings are open to all individuals with an interest in learning about how to improve and protect water quality in the Geronimo and Alligator Creek's Watershed.

Refreshments (sandwich fixings, chips, drinks) will start at 5:30 with the meeting beginning at 6pm. Agenda topics include a presentation by the Texas Parks & Wildlife Department (TPWD) Mussel Watch Program. Believe it

or not, there are mussels in our local creeks! We will also discuss the upcoming Feral Hog Workshop tentatively scheduled for May 23, 2014, begin planning the 2014 Creek Cleanup Event, discuss the upcoming NEMO workshop, look at the latest water quality monitoring data, and provide updates on other project efforts.

Come find out how you can get involved. We hope to see you there! For more information contact Ward Ling at 979-845-6980 or wling@ag.tamu.edu

Exhibit 5 - OSSF Workshops (news release, flyer, attendance sign-in sheets)

Homeowner Septic System Workshops scheduled for November 12 and 13

Ward Ling, 979-845-6980, wling@ag.tamu.edu

Do you have a septic system and want to know more about it? Come to a free Homeowner Septic System Workshop and learn more about how septic systems work—or don't work sometimes.

Texas A&M AgriLife Extension Service, Guadalupe-Blanco River Authority and Texas State Soil and Water Conservation Board will sponsor two Homeowner Septic System Workshops on November 12th and 13th from 6 to 8 pm. Course content is identical each evening, so we encourage you to attend the course at the location that is most convenient. The course will not certify individuals to maintain their septic system, but will provide a very good introduction to overall system function and maintenance.

The 2-hour course will provide a basic understanding of the operational and maintenance activities of conventional and aerobic septic systems. Topics covered will include treatment processes, health and safety considerations, an overview of how to inspect and maintain the system, and how activities in the home can impact the system. The course provides answers to some of the most frequently asked questions, including when to pump out a tank and what can and cannot go down the drain.

In [Guadalupe County](#) homeowners with aerobic systems are required to have a maintenance contract with a licensed service provider for two years after installation. After that time the homeowner must continue to have their system under a maintenance contract or they may obtain certification and maintain their own system. Septic system owners wishing to become certified should consult the [Texas Onsite Wastewater Association website](#) to view the schedule for the 16-hour Basic Maintenance Provider Course, which is the only course that will certify them to maintain their system. [Comal County](#) residents have the same two-year requirement after installation to have a maintenance contract, but after that time the homeowner is not required to be certified in order to maintain their own system.

Course Information:

Tuesday, Nov. 12, 2013, 6-8pm
GBRA River Annex
905 Nolan Street
Seguin, Tx 78155

Wednesday, Nov. 13, 2013, 6-8pm
Comal County Extension Office
325 Resource Drive
New Braunfels, Tx 78132

Registration is required to reserve a seat. To register, contact:

Ward Ling, Texas A&M AgriLife Extension
979-845-6980
wling@ag.tamu.edu

Interested in learning how to keep your septic system functioning properly?



Attend the Homeowner Maintenance of Systems Course for Free!

This course provides a basic understanding of the operational and maintenance activities of conventional and aerobic septic systems, and explains how activities within the home impact septic systems. Presentations will cover the treatment processes, health and safety considerations, and an overview of how to inspect and maintain the system. This course also provides answers to the most frequently asked septic system questions, including when to pump out a tank and what can or cannot go down the drain.

The same course will be offered in two locations. Attend the course offering that is most convenient for you.

Course Information:

TUESDAY, NOVEMBER 12, 2013, 6:00—8:00PM

**GBRA River Annex
905 Nolan Street
Seguin, Tx 78155**

WEDNESDAY, NOVEMBER 13, 2013, 6:00 - 8:00PM

**Comal County Extension Office
325 Resource Drive
New Braunfels, TX 78132**

Cost: Free!

To register: Seating is limited, so contact Ward Ling at wling@ag.tamu.edu

979-845-6980



Why Should You Attend?

Septic systems are not “flush and forget” systems! Therefore maintenance is essential to ensure proper function and longevity of your septic system. Attendees will gain a better understanding of how to maintain their septic system to protect the health of their family and the environment.

For More Information Contact:

Ward Ling, Extension Program Specialist
979-845-6980 or wling@ag.tamu.edu

OR

Ryan Gerlich, Extension Program Specialist
(979) 458-4185 or RAGerlich@ag.tamu.edu

This is made possible by funding through the Clean Water Act Section 319(h) dollars provided through the Texas State Soil and Water Conservation Board (TSSWCB).



Exhibit 6 - 2014 OSSF Workshop Flyer

Interested in learning how to keep your septic system functioning properly?



Attend the Homeowner Maintenance of Systems Course for Free!

The 2 hour course in Seguin provides a basic understanding of the operational and maintenance activities of conventional and aerobic septic systems, and explains how activities within the home impact septic systems. Presentations will cover the treatment processes, health and safety considerations, and an overview of how to inspect and maintain the system. This course also provides answers to the most frequently asked septic system questions, including when to pump out a tank and what can or cannot go down the drain. The 6 hour course in New Braunfels covers the same material as the 2 hour class, but goes more in depth on aerobic systems and their operation and maintenance.

Two different courses are being offered in two different locations. Attend the course offering that fits your needs.

Course Information:

MONDAY, APRIL 28, 2014, 6:00PM—8:00PM

**GBRA River Annex
905 Nolan Street
Seguin, Tx 78155**

TUESDAY, APRIL 29, 2014, 8:30AM - 3:30PM

**NBU Service Center
355 FM 306
New Braunfels, TX 78130**



Cost: Free!

**To register: Seating is limited, so contact Ward Ling at wling@ag.tamu.edu
979-845-6980**

Why Should You Attend?

Septic systems are not “flush and forget” systems! Therefore maintenance is essential to ensure proper function and longevity of your septic system. Attendees will gain a better understanding of how to maintain their septic system to

For More Information Contact:

Ward Ling, Extension Program Specialist
979-845-6980 or wling@ag.tamu.edu

This is made possible by funding through the Clean Water Act Section 319(h) dollars provided through the Texas State Soil and Water Conservation Board (TSSWCB).



Exhibit 7 - Implementation Spreadsheets

Urban Management Measures	Jurisdiction	Goal	Number Implemented	Goal
		Yrs 1 - 3	Yrs 1 - 3	Yrs 4 - 6
Pet waste collection stations	New Braunfels	6		3
Pet waste collection stations	Seguin	5		2
Initiate pet spay/neuter program	New Braunfels	1		
Enhance spay/neuter program	Seguin	1		1
Comprehensive urban storm water assessment	Seguin	1		
Comprehensive urban storm water assessment	New Braunfels	1		
Increase frequency and coverage of Phase II Permit activities	New Braunfels			
Street sweeping program	Seguin	6	ongoing	6
Street sweeping program	New Braunfels	6	ongoing	6
Enhance storm water management practices	Seguin			
Modify storm water conveyance systems	Seguin			

Contact Log	Contact Person/Entity	Contact Info	Frequency	Schedule Goal Date
Pet waste collection stations	Seguin-Bill Couch			
Pet waste collection stations	New Braunfels-Steve Ramsey			
Initiate pet spay/neuter program	New Braunfels-Steve Ramsey			2013
Enhance spay/neuter program	Seguin-Pamela Centeno			2013
Comprehensive urban storm water assessment				

Comprehensive urban storm water assessment

Increase frequency and coverage of Phase II

Permit activities

Street sweeping program

Street sweeping program

Enhance storm water management practices

Modify storm water conveyance systems

Number Implemented Yrs 4 - 6	Goal Yrs 7 - 10	Number Implemented Yrs 7 - 10	Notes
	3		
	2		
	1		working with NB WC to implement
			after homeowner septic system decommissioning
			working with NB
	8		1 unit goal is one street sweeping event in the watershed
	8		1 unit goal is one street sweeping event in the watershed
			working on codes 2013

Notes

Seguin did not get funded in 2013. Contact with Centeno 11/11/12 found that the city had applied to a different source (not DSHS).

		Goal	Number Implemented	Goal	Number Implemented
		Yrs 1 - 3	Yrs 1 - 3	Yrs 4 - 6	Yrs 4 - 6
Agricultural Management Measures					
WQMP Technician	SWCD	1	tech hired Jan 2014	1	
Water quality management plans	SWCD	15		31	
Non-domestic animal and wildlife measures					
Feral hog control technician	Extension	1	1	1	
Feral hog control equipment	Extension	10 traps		10 traps	

Goal	Number Implemented	Notes
Yrs 7 - 10	Yrs 7 - 10	
1		grant developed and submitted to EPA spring 2013
32		
1		feral hog education coordinator began fall 2012
10 traps		traps to be provided to landowners on a temporary basis to remove hogs from property

Wastewater	Jurisdiction	Goal	Number	Goal	Number
		Yrs 1 - 3	Implemented Yrs 1 - 3	Yrs 4 - 6	Implemented Yrs 4 - 6
Wastewater Collection System line testing/replacement (SSO Initiative)	New Braunfels Utilities		ongoing		
Modifications to the Geronimo Creek Lift Station (SSO Initiative)	City of Seguin	1	1		
Expand County OSSF Education Programs	Extension	2	ongoing	2	
Septic System Repair	Homeowner	10		15	
Septic System Replacement					
Septic System Decommissioning		150	in place		
Expand the Existing Household Hazardous Waste Program	Cities of Seguin and New Braunfels	2		2	

Goal	Number Implemented	Notes
Yrs 7 - 10	Yrs 7 - 10	
		ongoing
2		completed upgrades 2 homeowner workshops completed fall 2013/ 2 more schedule for spring 2014
15		
		OVN project is ongoing
2		

Educational Programs		Goal	Number Implemented
	Jurisdiction	Yrs 1 - 3	Yrs 1 - 3
Broad-Based Programs			
Texas Watershed Stewards	Extension	1	
Public School Education Program	GBRA	1	1
Watershed Protection Brochure	Extension/GBRA	1	
Newsletter	Extension	Jun-13	1
		Aug-13	1
		Nov-13	1
		Feb-14	
Displays at Local Events	Extension/TSSWCB	6	5
Nonpoint Source Pollution Educational Programs	Seguin Outdoor Learning Center		yes
Texas Well Owner Network Workshop	Extension	1	1
Lone Star Healthy Streams Program	Extension	1	
Urban Programs			
	Jurisdiction	Goal	Number Implemented
		Yrs 1 - 3	Yrs 1 - 3
Urban Sector Nutrient Education	Extension	3	
Pet Waste Programs	Cities, TCEQ, Extension	3	
NEMO Workshops	GBRA, TCEQ, Extension	2	
Fats, Oil, Grease Workshops	GBRA, TCEQ, Extension	2	no longer offered
Master Gardener/Master Naturalist Trainings	GBRA, TCEQ, Extension	2	
Sports and Athletic Field Education Workshops	Extension	3	no longer offered

		Goal	Number Implemented
Wastewater Programs	Jurisdiction	Yrs 1 - 3	Yrs 1 - 3
Advertise Septic System Online Training Modules	GBRA	3	done
Septic System Workshops and Assistance	Extension/GBRA	4	2

		Goal	Number Implemented
Agricultural Programs	Jurisdiction	Yrs 1 - 3	Yrs 1 - 3
Soil and Water Testing Campaigns	Extension	3	1
Agriculture Nutrient Management Education	Extension	3	1
Crop Management Seminars	Extension	3	1
Agricultural Waste Pesticide Collection Days	TCEQ	1	
Livestock Grazing Management Education	Extension	3	1

		Goal	Number Implemented
Non-domestic Animal and Wildlife Programs	Jurisdiction	Yrs 1 - 3	Yrs 1 - 3
Feral Hog Management Workshop	Extension	2	

		Goal	Number Implemented
Additional Programs	Jurisdiction	Yrs 1 - 3	Yrs 1 - 3
Community Stream Cleanup Events	GBRA	2	1
Rainwater Harvesting Education/Demonstration	Extension	2	

Post "Don't Mess With Texas Water" Signage

Extension

4

Goal Yrs 4 - 6	Number Implemented Yrs 4 - 6	Goal Yrs 7 - 10	Number Implemented Yrs 7 - 10	Notes
1		1		possibly fall 2014/spring 2015
		2		
6		6		
3		3		grant app submitted fall 2013 to TCEQ
				summer 2014

Goal Yrs 4 - 6	Number Implemented Yrs 4 - 6	Goal Yrs 7 - 10	Number Implemented Yrs 7 - 10	Notes
3		4		
3		4		
0		0		planned for March 25, 2014
0		0		
2		2		
3		4		

Goal	Number Implemented	Goal	Number Implemented	Notes
Yrs 4 - 6	Yrs 4 - 6	Yrs 7 - 10	Yrs 7 - 10	
3		4		
3		3		

Goal	Number Implemented	Goal	Number Implemented	Notes
Yrs 4 - 6	Yrs 4 - 6	Yrs 7 - 10	Yrs 7 - 10	
3		3		
3		3		
3		3		
1		1		
3		3		

Goal	Number Implemented	Goal	Number Implemented	Notes
Yrs 4 - 6	Yrs 4 - 6	Yrs 7 - 10	Yrs 7 - 10	
1		2		

25-May-14

Goal	Number Implemented	Goal	Number Implemented	Notes
Yrs 4 - 6	Yrs 4 - 6	Yrs 7 - 10	Yrs 7 - 10	
3		3		April 6, 2013 and planned for April 5, 2014
1		2		possibly fall 2014

0

0

no longer available

Exhibit 8 - Presentation at Watershed Planning Short Course

Wastewater Treatment Systems, Wastewater Issues, Permits and On- line Wastewater Treatment Modules

Debbie Magin
Guadalupe-Blanco River Authority

November 6, 2013

Wastewater Treatment Plants –

Easy Target to
explain
Pollutant Sources



Could be a source of the
pollutant load but.....

it shouldn't take our attention
and resources off of NPS

Information to convey to your stakeholders about wastewater treatment facilities

- TCEQ has “primacy” – review, issue and regulate permits to dispose of wastewater
 - Discharge permits
 - Land application permits (zero discharge)
- EPA still reviews, comments and approves major permits (> 1 MGD) – new and renewals
- Other agencies will review permits



Water Quality Permits

– Issued on five-year basin cycle



– Inspected by TCEQ regional offices



– Constructed under TCEQ design standards



– Operated by

licensed operators



Water Quality Permits

- Permits specify:
 - Discharge, land application, subsurface?



Water Quality Permits

- Permits specify:
 - Discharge, land application, subsurface?
 - Discharge volume and quality

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Outfall Number 001

1. During the period beginning upon the date of issuance and lasting through the date of expiration, the permittee is authorized to discharge subject to the following effluent limitations:

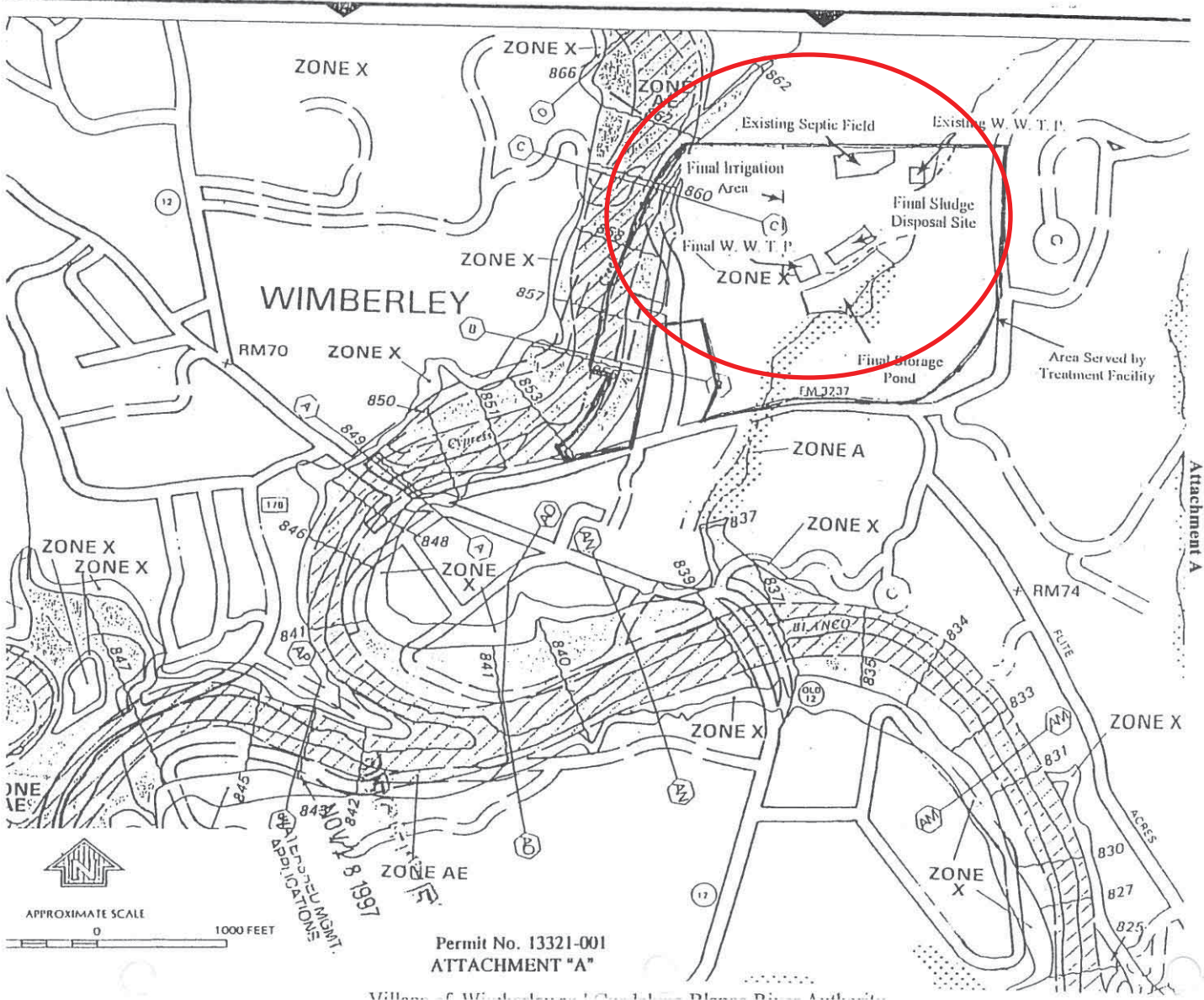
The annual average flow of effluent shall not exceed 1.5 million gallons per day (MGD); nor shall the average discharge during any two-hour period (2-hour peak) exceed 3,125 gallons per minute (gpm).

<u>Effluent Characteristic</u>	<u>Discharge Limitations</u>				<u>Minimum Self-Monitoring Requirements</u>	
	Daily Avg mg/l(lbs/day)	7-day Avg mg/l	Daily Max mg/l	Single Grab mg/l	Report Daily Avg. & Daily Max. Measurement Frequency	Sample Type
Flow, MGD	Report	N/A	Report	N/A	Continuous	Totalizing Meter
Carbonaceous Biochemical Oxygen Demand (5-day)	10 (125)	15	25	35	Two/week	Composite
Total Suspended Solids	15 (188)	25	40	60	Two/week	Composite
Ammonia Nitrogen	3 (38)	6	10	15	Two/week	Composite
<i>E. coli</i> , colonies per 100 ml	126	N/A	394	N/A	One/day	Grab

2. The permittee shall utilize an Ultraviolet Light (UV) system for disinfection purposes. An equivalent method of disinfection may be substituted only with prior approval of the Executive Director.
3. The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored once per week by grab sample.
4. There shall be no discharge of floating solids or visible foam in other than trace amounts and no discharge of visible oil.
5. Effluent monitoring samples shall be taken at the following location(s): Following the final treatment unit.
6. The effluent shall contain a minimum dissolved oxygen of 5.0 mg/l and shall be monitored twice per week by grab sample.
7. The annual average flow and maximum 2-hour peak flow shall be reported monthly.

Water Quality Permits

- Permits specify:
 - Discharge, land application, subsurface?
 - Discharge volume and quality
 - Discharge point or land application site



Permit No. 13321-001
ATTACHMENT "A"

Village of Wimberley, Guadalupe-Blanco River Authority

Water Quality Permits

- Permits specify:
 - Discharge, land application, subsurface?
 - Discharge volume and quality
 - Discharge point
 - Monitoring and reporting frequencies

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

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<u>Effluent Characteristic</u>	<u>Discharge Limitations</u>				<u>Minimum Self-Monitoring Requirements</u>	
	Daily Avg mg/l(lbs/day)	7-day Avg mg/l	Daily Max mg/l	Single Grab mg/l	Report Daily Avg. & Daily Max. Measurement Frequency	Sample Type
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6. The effluent shall contain a minimum dissolved oxygen of 5.0 mg/l and shall be monitored twice per week by grab sample.
7. The annual average flow and maximum 2-hour peak flow shall be reported monthly.

Water Quality Permits

- TCEQ considers:
 - Receiving body of water and/or aquifer protection
 - Designated uses
 - 303d list
 - TMDL
 - Other discharges and WLAs

Water Quality Permits

- Issues - new or being considered
 - Bacterial limits – in permits after January 2010
 - De-chlorination for smaller facilities
 - Water Quality Standards and Implementation Procedures
 - Nutrient stream standards -> nutrient limitations

Resources for Watershed Coordinators and Stakeholders

- TCEQ Website: www.tceq.texas.gov
- Find a permit:
<http://www12.tceq.state.tx.us/crpub/index.cfm?fuseaction=addnid.IdSearch>
- Permit status (Central Registry):
http://www.tceq.texas.gov/agency/data/permit_data.html



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

- For the **Public**
- For **Businesses**
- For **Governments**



AIR

LAND

WATER

- Cleanups, Remediation
- Emergency Response
- Licensing
- Permits, Registrations
- Preventing Pollution
- Recycling
- Reporting
- Rules

Search Central Registry:

- ▶ by Permit/Registration (program ID number)
- ▶ by Name/ Company (customer)
- ▶ by Facility/ Site (regulated entity)

IN FOCUS

Texas Drought

Find Drought Information 

View Map: Drought Impact on Texas Surface Water

Texas Wildfire Information

Hurricane Season: Preparing for Storms

Natural Outlook Article:

TCEQ's Drought Planning Pays Off.

Intra-agency team manages 

HOW DO I...

- Make an environmental complaint**
- Sign up for e-mail updates**
- Get involved**
- Offer comments**
- Track complaints, enforcement**
- Know if I need a permit or license**
- Find the status of a permit, license**
- Check air quality in my area**

HOT TOPICS

Commissioners' Corner

- Agenda Meetings and Work Sessions**
- View Pending Matters and File Documents**
- Orders Issued**
- About the Commissioners**
- Executive Director's Agendas**

NEWS RELEASES

TCEQ Approves Final



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

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AIR

LAND

WATER

- Cleanups, Remediation
- Emergency Response
- Licensing
- [Permits, Registrations](#)
- Preventing Pollution
- Recycling
- Reporting
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Permits and Licenses You Might Need

- Air Permits
- Edwards Aquifer Plans
- Landscape Irrigation
- Mining and Mineral Extraction
- On-Site Sewage Facilities, Including Septic Systems
- Petroleum Storage Tanks (PSTs)
- Radioactive Materials
- Storm Water Permits
- Surface Casing
- Waste Management Permits
- Water Quality Permits**
- More...

Search Central Registry:

- [▶ by Permit/Registration \(program ID number\)](#)
- [▶ by Name/Company \(customer\)](#)
- [▶ by Facility/Site \(regulated entity\)](#)

- ental
- updates
- enforcement
- mit or license
- permit,
- my area

- Commissioners' Corner
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Intra-agency team manages

HOT TOPICS

NEWS RELEASES
TCEQ Approves Final



Site Navigation

- Cleanups, Remediation
- Emergency Response
- Licensing
- Permits, Registrations
- Preventing Pollution
- Recycling
- Reporting
- Rules

Water Quality Permits and Registrations

Applications, other forms, and rules for obtaining wastewater and stormwater permits.

- [Wastewater Permits](#)
 - [Pretreatment](#)
 - [For Cities and Other Municipalities](#)
 - [For Industries](#)
 - [For Agricultural Operations](#)
- [Sludge Application to Land](#)
- [Stormwater Permits](#)

Related content

[Delinquent Fees and Penalties Will Affect Processing Applications](#)

- Data
- Forms
- Maps
- Public Notices
- Publications
- Records
- Webcasts



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

- For the **Public**
- For **Businesses**
- For **Governments**



AIR

LAND

WATER

- Cleanups, Remediation
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Commissioners' Corner

- Agenda Meetings and Work Sessions**
- View Pending Matters and File Documents**
- Orders Issued**
- About the Commissioners**
- Executive Director's Agendas**

NEWS RELEASES

TCEQ Approves Final



Central Registry Query - Additional ID Search

Search for a regulated entity by the permit, registration, or other ID number issued by TCEQ program areas.

Additional ID Search

Search by entering an ID and selecting whether to search for the full ID or use a partial match, i.e. return all IDs containing the string. You may also select a program area to narrow the search results.

Program ID: (Permit, registration, or other program identifier.)

Search Type: full ID partial ID

ID Status: (ID status, only used if program or ID entered.)

Program:



Central Registry Query - ID Search Results List

Your Search Returned **2** Records. Click on a column name to change the sort or an RN to view the regulated entity information. In some cases the Additional Id will be a link to the Additional Id Details.

1-2 of 2 Records

RN Number	Regulated Entity Name ▲	Location	County	Program	ID	Type	Status
RN101325926	GBRA LOCKHART WWTP 2	No location on file	CALDWELL	WASTEWATER LICENSING	WQ0010210002	LICENSE	INACTI
RN101325926	GBRA LOCKHART WWTP 2	No location on file	CALDWELL	WASTEWATER	WQ0010210002	PERMIT	ACTIVE

1-2 of 2 Records

The following search criteria was entered:

Additional ID: WQ0010210002

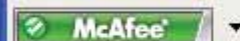
Search Type: full

[Disclaimer](#) |
 [Web Policies](#) |
 [Accessibility](#) |
 [Serving Our Customers](#) |
 [TCEQ Homeland Security](#) |
 [Central Registry](#) |
 [Search Hints](#) |
 [Report Data Errors](#)



Last Modified 7/26/2010

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Central Registry

Detail of: **Wastewater Permit WQ0010210002** [View Permit](#)

For: **GBRA LOCKHART WWTP 2 (RN101325926)**

No physical location description on file.

Permit Status: **ACTIVE**

Held by: **GUADALUPE-BLANCO RIVER AUTHORITY (CN601180565)**

OWNER Since 07/07/2010 [View Compliance History](#)

Mailing Address: Not on file

Related Information:

[Commissioners' Actions](#)

[Complaints](#)

[Investigations](#)

[Notice of Violations](#)

[Permit Information](#)

There is no information related to this Permit in the following categories:

[Correspondence Tracking](#)

[Effective Enforcement Orders](#)

Other resources on TCEQ Website

[Commissioners' Integrated Database](#)

Tracks status of all matters pending before the Commission and Executive Director for approval, after notice issued, if applicable. Includes enforcement cases, rules, permit and license applications, registrations, actions involving water districts.

[Search the TCEQ Central Registry](#)

To find the permit number by site, facility name, permit holder, county, or other information, look in our Central Registry. Here you can also find out whether a site had a permit at any point in the past, as well as the name and contact information of the permit holder.

[Licensing and Registration Information](#)

Find licensing, training credits, and registration information for individuals and companies.

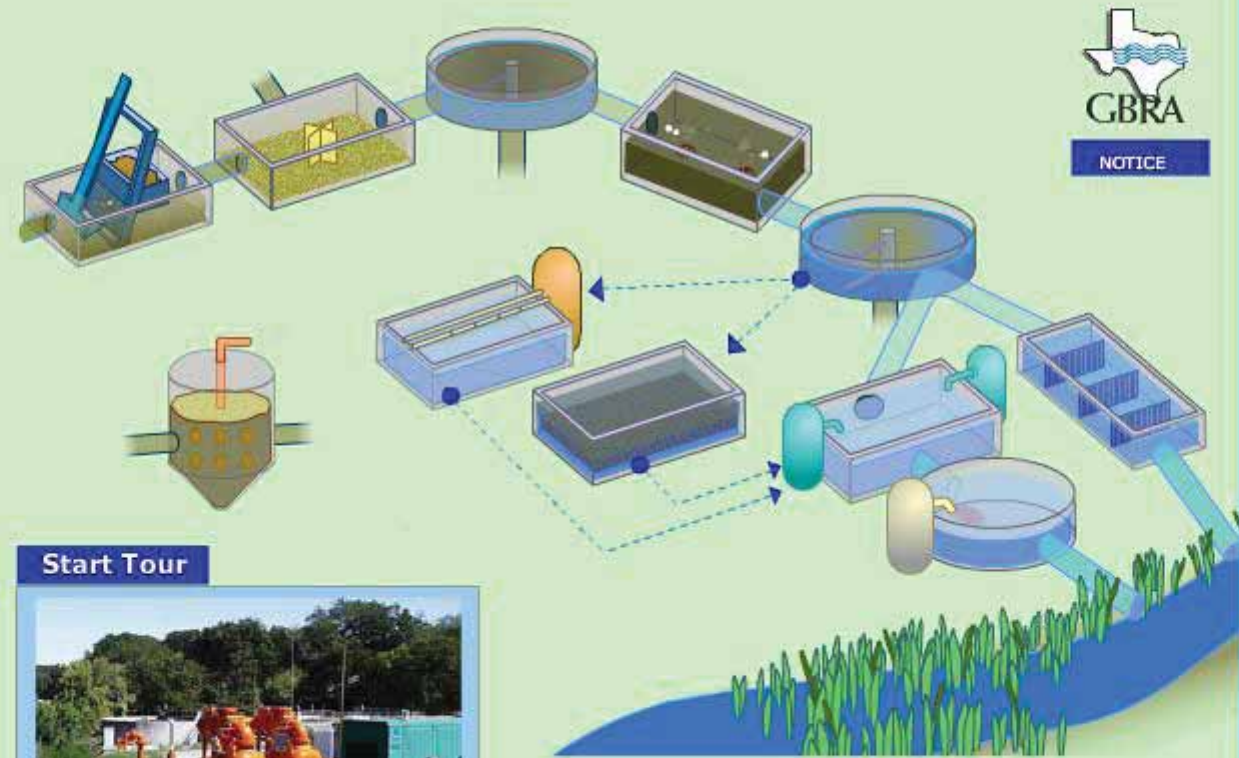
Other thoughts....

- Invite representatives from WWTP operations to serve on stakeholders committee or serve on technical advisory committee
- Tour wastewater treatment plants
- Have speakers from TCEQ or consulting firms to explain permitting process, treatment process, specific to the permits in watershed
- Use on-line modules

4 Online Modules

- <http://www.gbra.org/wastewater-treatment.swf>
- <http://www.gbra.org/septic.swf>
- <http://www.gbra.org/septic-spanish.swf>
- <http://www.gbra.org/fog.swf>
- <http://www.gbra.org/stormwater>

Wastewater Treatment



Start Tour



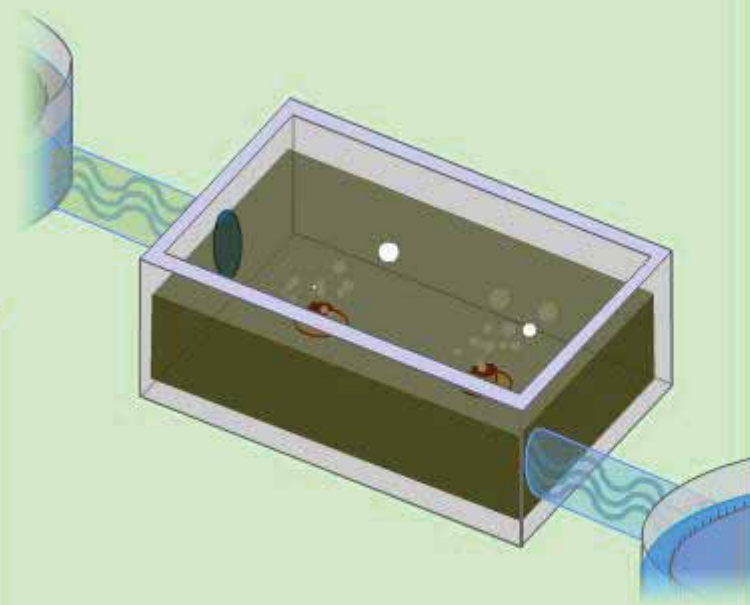
Roll over each of the images above to find out what it is, and click on it to get a detailed description. Click on the "start tour" button to run the show from the beginning.

Secondary Treatment

Overview of Plant Aeration Basin

The use of biological processes to provide further treatment is referred to as secondary treatment.

The wastewater, having had most of the solids removed in primary treatment, flows on to an aeration basin. Air is added to the aeration basins to create an environment for beneficial/helpful microorganisms to grow and continue treating the remaining pollutants in the wastewater.



OSSF Online Educational Module

septic11.swf (application/x-shockwave-flash Object) - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://home.grandecom.net/~scottr/septic11.swf

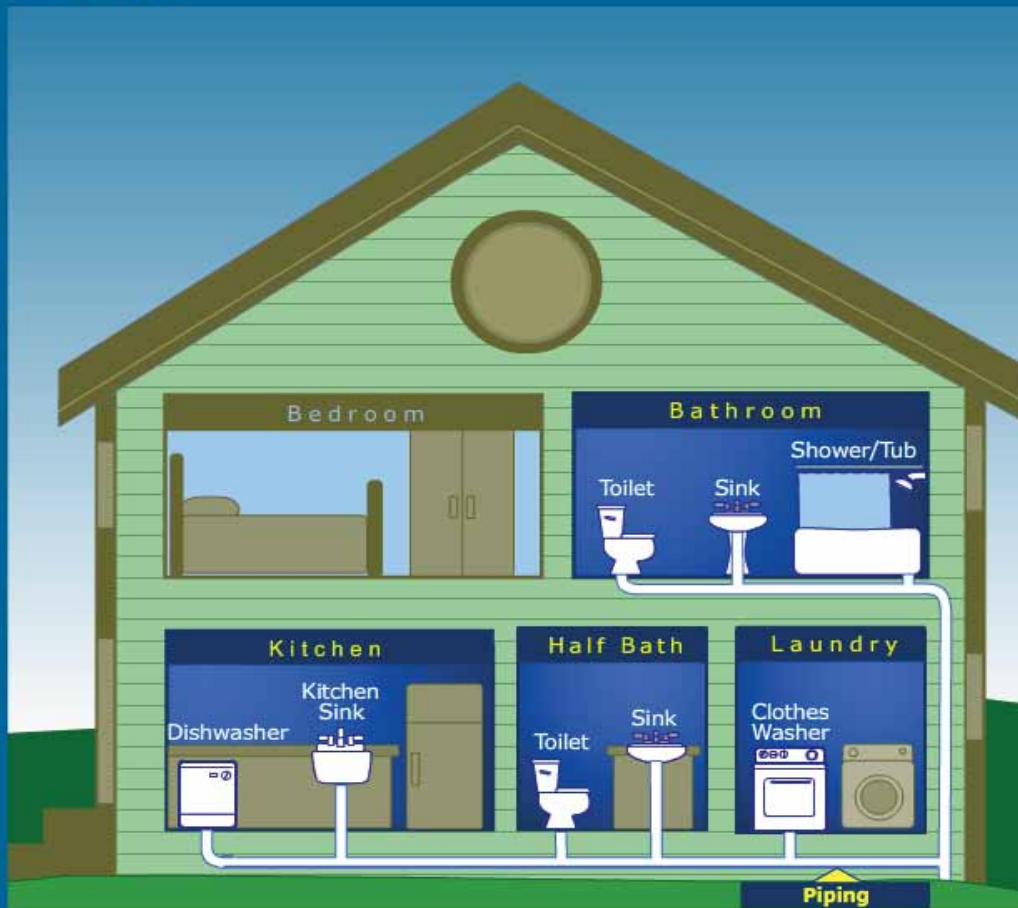
asin Summary Report

Most Visited Customize Links Windows Media Windows

Guadalupe-Blanco River Authorit... Guadalupe-Blanco River Authorit... wastewater-treatment.swf (appl... septic11.swf (application/x-...



HOW A SEPTIC SYSTEM WORKS



Wastewater Source (House)

The source of wastewater is the domestic water used in homes, schools or businesses that the treatment system serves. Domestic wastewater is water discharged from plumbing fixtures, appliances, toilets, baths, laundry and the dishwasher. Wastewater is typically 99.9% liquid.

Click on the home water applications to learn their uses and misuses.

Overview

To Septic Tank

OSSF Online Educational Module

septic11.swf (application/x-shockwave-flash Object) - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://home.grandecom.net/~scottr/septic11.swf

asin Summary Report

Most Visited Customize Links Windows Media Windows

Guadalupe-Blanco River Authorit... Guadalupe-Blanco River Authorit... wastewater-treatment.swf (appl... septic11.swf (application/x-...

TCEQ GBRA

HOW A SEPTIC SYSTEM WORKS

AgriLIFE EXTENSION
Texas A&M System

To House

Conventional Septic System Pretreatment

In the pretreatment portion of a septic system, many of the contaminants are removed from the wastewater in order to prepare it for final treatment and discharging into the environment. Contaminants in the wastewater include harmful bacteria that can cause illness, as well as nitrogen and phosphorus that can stimulate algae growth in water bodies.

Run the Water **Conventional System** **Aerobic System**

Final Treatment and Dispersal

Septic System Pretreatment

The diagram illustrates a cross-section of a septic system. On the left, a house is shown with a pipe leading to a two-chambered septic tank. The first chamber is labeled 'Septic System Pretreatment'. A pipe from the second chamber leads to a 'Final Treatment and Dispersal' area, which consists of a long, narrow, perforated pipe buried in the ground. A control panel on the right side of the diagram has three buttons: 'Run the Water', 'Conventional System', and 'Aerobic System'. The 'Aerobic System' button is highlighted in green.

OSSF Online Educational Module

septic11.swf (application/x-shockwave-flash Object) - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://home.grandecom.net/~scottr/septic11.swf

Most Visited Customize Links Windows Media Windows

Guadalupe-Blanco River Authorit... wastewater-treatment.swf (appl... septic11.swf (application/x-...



HOW A SEPTIC SYSTEM WORKS



To House

Aerobic Septic System

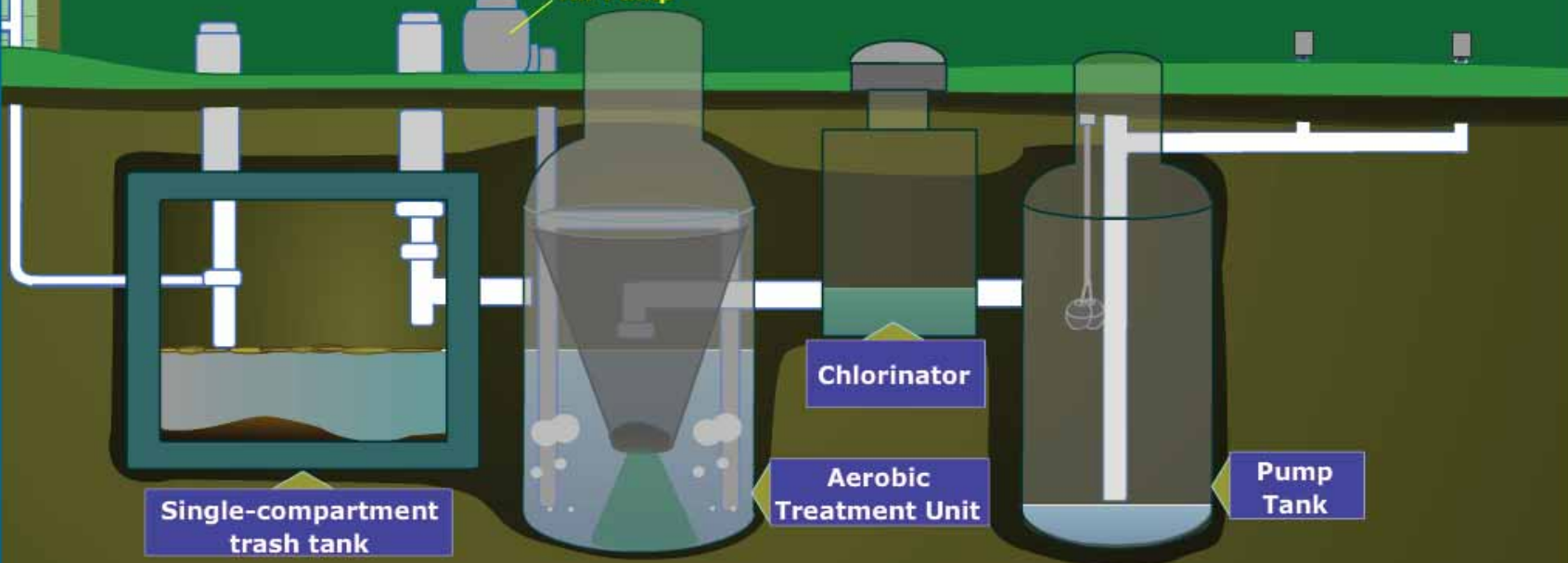
Run the Water

Conventional System

Aerobic System

Rules That Apply to Aerobic Septic Systems

Electrical Air Pump





WHAT IS FOG?

AIR
T L R
S S E
A
S
E

AND BESIDES THAT...
WHAT IS HHW?

FORWARD

GARAGE

HOUSE 1

HOUSE 2

WASTEWATER PUMP STATION

TREATMENT PLANT

FOOD SERVICES 1

FOOD SERVICES 2

INTRO

GBRA NOTICE

Help Inspector Clued-N find the villainous Oyl E. Fatt. Click on each of the listed locations above to find out where he is hiding! Explore each of these sites to find out which ones are following Best Management Practices... and which are not.

IMPROPER DISPOSAL OF RESIDENTIAL WASTE



Don't put dishes with built up oils and fats on them in the dishwasher.

Scrape the waste into the trash first!

Click on this bubble to close.

[RETURN TO CITY](#)

[MORE WAYS TO TACKLE GREASE](#)

[Return to Plum Creek page](#)

PREVENTING STORM WATER POLLUTION FROM MUNICIPAL OPERATIONS

Municipal employees play an important role in reducing storm water pollution associated with municipal operations. This activity will highlight many of the "do's and don'ts" of your daily tasks, which have a direct impact on water quality in our creeks and rivers.

Click each icon to learn how to keep pollutants out of our storm drains, keeping our streams and rivers clean.

GBRA
MORE INFO

PARKS AND REC

STREETS AND DRAINS

FLEET UPKEEP

STORAGE AND SPILLS

TEST YOUR KNOWLEDGE

Sanitary Sewer Overflow Initiative

Sanitary Sewer Overflow (SSO) Initiative

Sanitary Sewer Overflow (SSO) – occurs when significant inflow/infiltration (I/I) in the collection system; the system is not properly operated and maintained; or its capacity is inadequate for collection, storage or treatment

Unauthorized discharge of untreated or partially treated wastewater from a collection system or its components (such as a manhole, lift station, or cleanout) before it has reached a treatment facility



Sanitary Sewer Overflow (SSO) Initiative

Goal -

Reduce the number of SSOs that occur each year in Texas and to address SSOs before they harm human health, safety, or the environment and before they become enforcement issues.

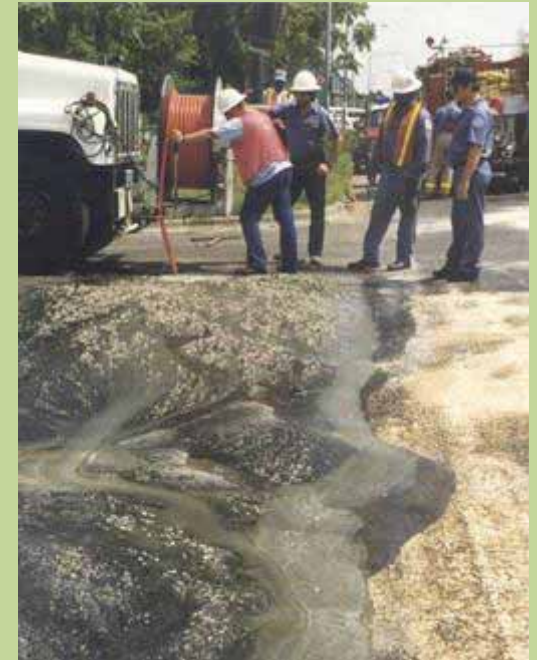


SSO Initiative - Benefits?

A participating facility will not be subject to formal enforcement for most continuing SSO violations, as long as the SSOs are addressed by the SSO plan.

Participation allows the facility to spend resources on correction as opposed to having to pay penalties associated with an enforcement order, in addition to the money required to complete corrective action.

Participation ensures that SSOs addressed by the SSO plan will not affect the facility's compliance history rating.



210 Authorization – Wastewater Reuse

210 Authorization – Wastewater Reuse

Reuse of treated wastewater

- must maintain an approved wastewater discharge permit
- quality of wastewater will govern what wastewater can be used for

Benefits:

- takes pressure off potable water sources
- reduces nutrients discharged to stream

Concerns:

- reduces flow in creek – biotic communities established because of consistent flow
- downstream appropriated water rights



Exhibit 9 - Project-Based Learning Outreach Campaign Resources

Brochure



Geronimo and Alligator Creeks Watershed Awareness



A quick guide to your local watershed

“Learn more about
what you can do
to save your local
watershed!”



<http://www.geronimocreek.org/>

Geronimo and Alligator Creeks Watershed

What is a watershed?

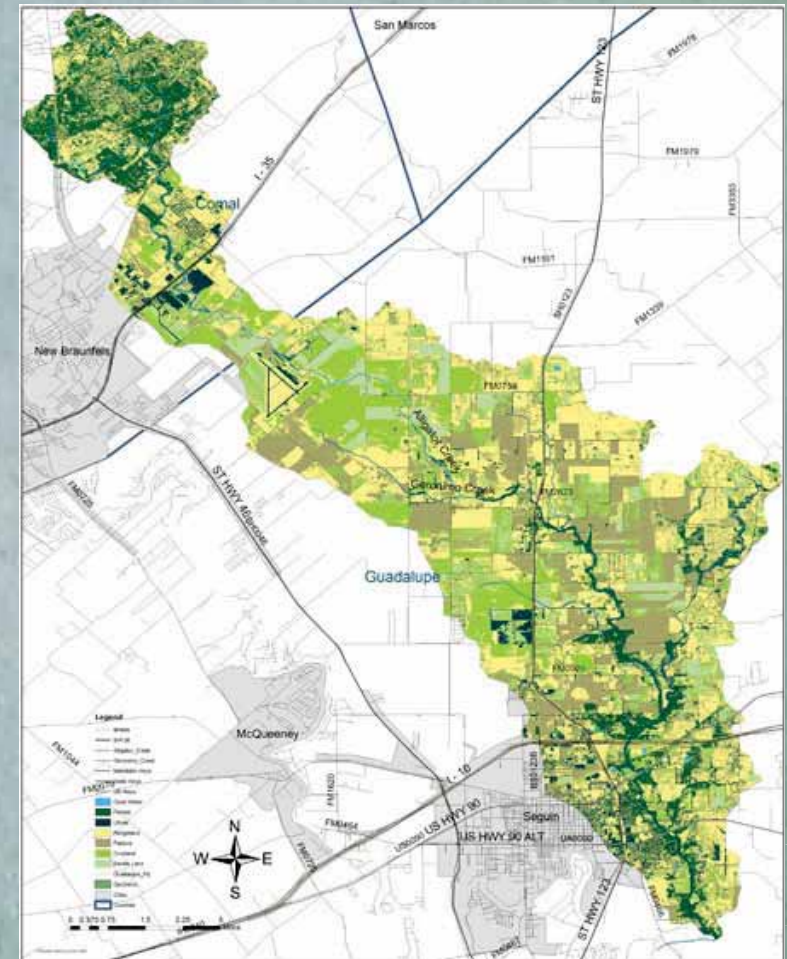
A watershed is an area of land that drains into a specific water body.

Did you know you live in a watershed?

Your actions have an impact on the Alligator and Geronimo Creek watersheds.

The Alligator and Geronimo Creek watershed is located in Comal and Guadalupe Counties. It is almost 70 square miles in area and it is broken down into two sub-watersheds. The majority of the Alligator Creek watershed lies within the city of New Braunfels' extra-territorial jurisdiction (ETJ). The Geronimo Creek watershed lies almost entirely within the city of Seguin's ETJ.

Alligator Creek flows southeast from New Braunfels towards Seguin until about midway down the watershed where it joins with Geronimo Creek. Geronimo Creek is a spring fed creek. Its headwaters are one mile east of the community of Clear Springs.



“Jump into
protecting the
watershed.”



Watersheds and Water Quality

To effectively address water issues caused by human activities point source and nonpoint source pollution must be considered.

Point source pollution is discharged from a defined location or a single point, such as a pipe from a factory.

Nonpoint source pollution comes from a source that does not have a defined single point of origin, like a subdivision.

"Give a hoot, don't pollute!"



One of the biggest pollutants to our watersheds is animal feces, from dogs, wild hogs, cows, horses, goats, etc. The bacteria from the waste of these animals impairs our water. "Impaired" means the water is not suitable for use.

Bacteria in water can spread high-risk pathogens and can cause viral diseases such as hepatitis A, vomiting, and diarrhea.

Another problem with fecal matter is that it is a nutrient. Nutrients will cause plants to grow faster which uses up oxygen faster too. This can decrease oxygen levels causing fish and other aquatic life to suffer.



What can you do to help your watershed?

One of the biggest things you can do to help Alligator and Geronimo Creeks is simply clean up after your pets!



"Stow it, don't throw it!"

Don't throw trash out of your car window, save it until you find a trash can. If you don't properly dispose of your trash it may end up in our creeks and rivers.

If you have a septic tank it is important that you get it inspected regularly. Failing septic systems contribute to pollution in creeks every year.

Use only the recommended amount of pesticide and fertilizers on your lawns. When it rains any extra pesticide or fertilizer on the surface can be washed into our creeks through runoff.



Do Your Part

This is not just our drinking and recreational water. People downstream will end up using the same water.

Actions by the communities upstream will affect the water downstream. Do your part to help keep our watersheds clean to benefit others even if you do not know who they are.

Help alert the community about the condition of our watershed by:

- ✦ telling your friends and family.
- ✦ getting involved with the community.

Magnet

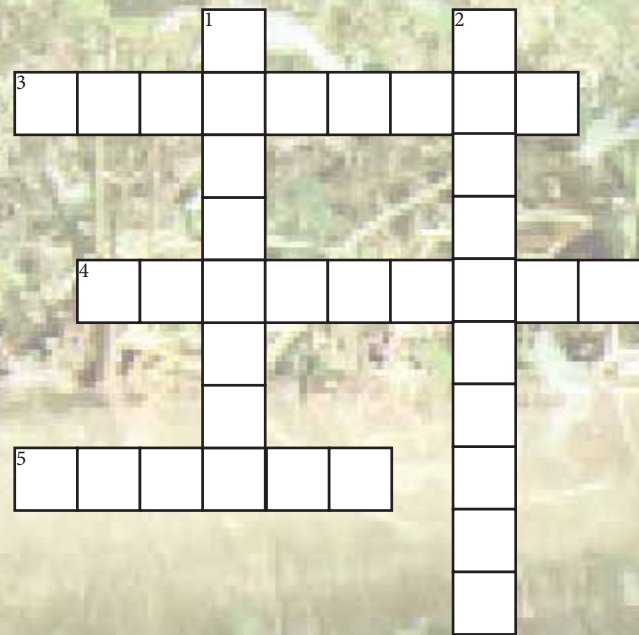


STOP
POLLUTION
QUICK, DON'T
MAKE THE
WATER SICK!

I DON'T
THROW MY WATER
IN YOUR TRASH,
SO DON'T THROW
YOUR TRASH IN
MY WATER.

JUMP INTO THE WATERSHED FUN ZONE!

WATERSHED CROSSWORD



Across:

- 3. A _____ is an area of land that drains into a specific body of water.
- 4. _____ - _____ source pollution comes from different places, rather than a single source.
- 5. _____ will eventually end up in our creeks, streams, and rivers, in our river basin.

Down:

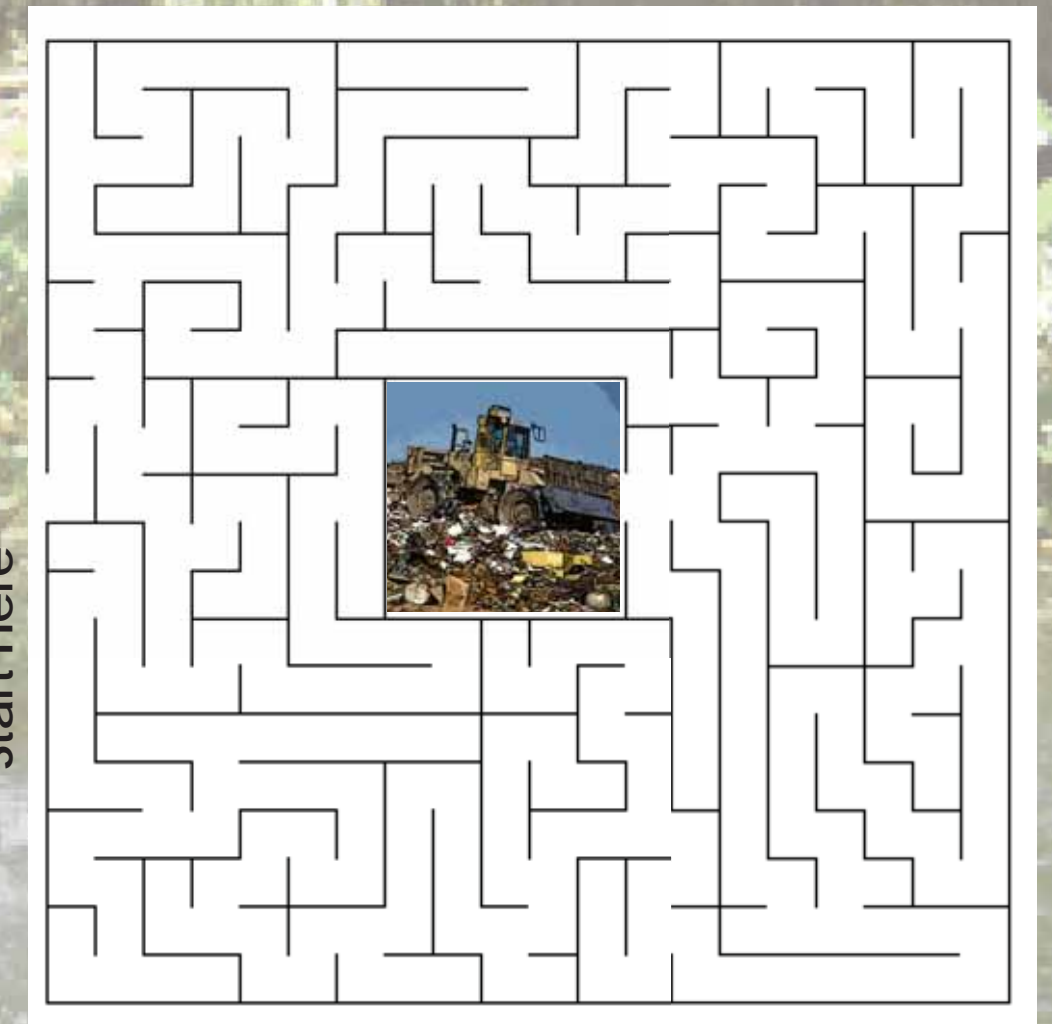
- 1. The city of Seguin is located in the _____ Creek Watershed.
- 2. Limit your use of _____ on your lawn to protect our watershed.

WATERSHED WORDSEARCH

I	N	S	L	G	C	K	Z	N	S	M	W
K	W	Z	W	O	J	V	Z	O	A	W	U
A	A	J	Z	H	V	A	J	I	N	Y	R
T	T	I	W	Z	J	L	R	T	V	N	D
X	E	Z	C	D	Y	E	V	U	K	I	O
O	R	S	T	R	T	P	B	L	N	A	G
A	S	W	P	C	E	X	H	L	Y	R	N
I	H	M	A	G	K	E	P	O	S	H	G
W	E	B	E	A	M	Y	K	P	P	F	N
H	D	I	E	G	E	R	O	N	I	M	O
J	P	A	R	M	Q	N	E	G	Y	X	O
E	B	R	O	T	A	G	I	L	L	A	N

- Word Bank:**
- | | |
|-----------|-----------|
| Alligator | Hog |
| Bacteria | Oxygen |
| Creek | Pollution |
| Dog | Rain |
| Geronimo | Watershed |

WATERSHED MAZE



Help the Garbage man get all the pollutants and trash to the Landfill.

GBRA SHS

Geronimo and Alligator Creeks Watershed Partnership

Scan with your mobile device to learn more about the Geronimo and Alligator Creeks Watershed.

JUMP INTO PROTECTING THE WATERSHED

A watershed is an area of land that drains into a specific body of water.



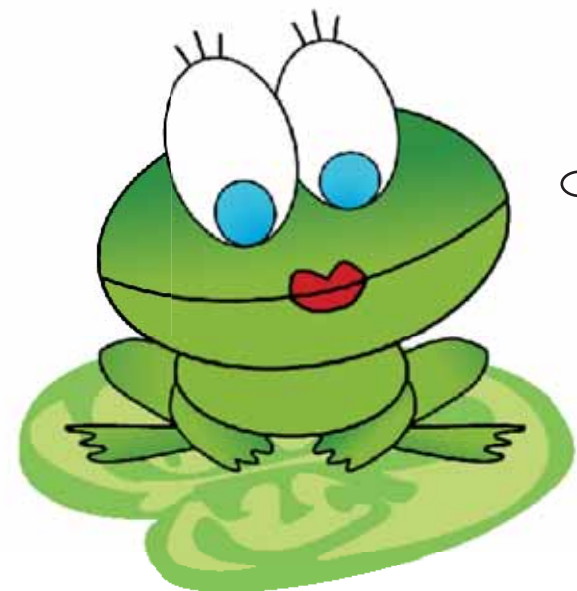
Non-point source pollution comes from different places, rather than a single source.



New Braunfels

"Hello, my name is Ron and down there is my twin sister Ali!"

"Like my brother said, I'm Ali and we're the frogs of the Geronimo and Alligator Creeks."



Geronimo

Seguin

Guadalupe River

Runoff will eventually end up in our creeks, streams, and rivers in our basin.



The cities of Seguin and Geronimo are located in the Geronimo Creek Watershed.

Limit your use of fertilizer on your lawn to protect our watershed.

For more fun, turn to the back!

Exhibit 10 - "Click-able" Ad in Seguin Gazette Online



"Click-able Ad" -
Seguin Gazette Online
Link to website