

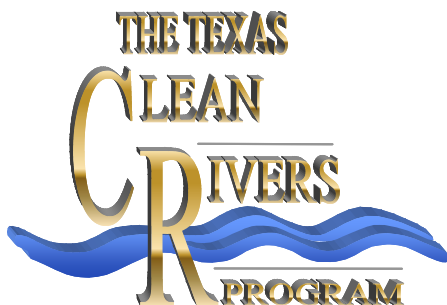
2006

BASIN HIGHLIGHTS REPORT

Lower Neches River Basin/
Neches-Trinity Coastal Basin



Lower Neches Valley Authority



Prepared in cooperation with the
Texas Commission on Environmental Quality
under the authorization of the
Texas Clean Rivers Act

2005 Basin Highlights

Since 1933, the Lower Neches Valley Authority (LNVA) has been developing and protecting the valuable water resources in the Lower Neches River basin. LNVA provides surface water to municipal, agricultural, and industrial customers through an extensive canal system fed by the Neches River and Pine Island Bayou. LNVA joined the Texas Clean Rivers Program (CRP) after it was created by the Texas Legislature in 1991. The goal of the program is to preserve and improve the quality of water resources in river basins throughout the State of Texas.

The Lower Neches Valley Authority coordinates the CRP for the assessment area encompassing the Neches-Trinity Coastal Basin and the lower Neches River Basin, while partner Angelina & Neches River Authority (ANRA) handles the same responsibilities in the upper portion of the basin. Figure 3, on page 9 is a map of the LNVA designated CRP assessment area.

Over the past year LNVA participated in many CRP activities while completing the fiscal year 2004-2005 contract and preparing for the current FY 2006-07 contract which is effective from September 1, 2005 to August 31, 2007. The most notable accomplishments in 2005 were:

- ⇒ Commencement of the Pine Island Bayou Use Attainability Analysis (UAA)
- ⇒ Discussion of possible sources of Ammonia-Nitrogen in Hillebrandt Bayou with workgroup
- ⇒ Further evaluation of elevated concentrations of dissolved metals in the LNVA assessment area
- ⇒ Review of the most recent Academy of Natural Sciences, Neches River Study Report

Pine Island Bayou UAA

In August 2005, the monitoring site evaluation was completed and three monitoring sites were selected for each water body. Study area coverage included the upper, lower, and middle portions of both Pine Island and Little Pine Island Bayou. Sampling



Figure 1. Catfish collected during Pine Island Bayou UAA

efforts of a UAA includes fish collection, macroinvertebrate collection, habitat diversity, stream flows and 24 hour dissolved oxygen collection.

For the second straight year, mother nature reeked havoc upon the Pine Island Bayou UAA, but in 2005, not even Hurricane Rita could completely suspend the commencement of the highly anticipated study. Although the approaching hurricane necessitated postponing monitoring on Little Pine Island Bayou, the TCEQ Surface Water Quality Monitoring team, with the support of Texas Parks and Wildlife and LNVA, successfully completed the first of three monitoring events on Pine Island Bayou. Monitoring of the Little Pine Island Bayou sites will be included in future data collection efforts.

Although a technical review of data collected in 2005 has not yet been performed, preliminary monitoring results seem to be positive. The Use Attainability Analysis will continue in 2006 with two

	PIB @ 770	LPIB @ 326	PIB @ OSL	PIB @ 105	PIB @ 69
24 Hour D.O. Mean per Event (mg/L)	2.1	3.2	4.2	4.6	5.1
% Time Attaining Standard (5.0 mg/L)	0	22	30	44	40

Table 1. Based on 24 hr. D.O. data collected between 2002 and 2005. Ten sampling events occurred during this time frame at each site. Sites are listed left to right in order from upstream to downstream within the watershed.

more sampling events. Historically, dissolved oxygen concentrations in Segment 607 have not met the minimum criteria set by the state. This study will try to discern if the observed lower D.O.'s are naturally occurring and have been detrimental to the aquatic community. Once the study is complete, data will be evaluated and stream standards will be reassessed, if necessary.

Hillebrandt Bayou Stakeholder Workgroup

In 2004 LNVA initiated a stakeholder workgroup to investigate possible causes of elevated ammonia nitrogen concentrations in the Hillebrandt Bayou watershed. In order to give the stakeholders an initial overview of the problem, LNVA completed several cursory steps as follows:

- ⇒ Identified and gathered existing data from monitoring entities on Hillebrandt Bayou
- ⇒ Developed segment wide inventory of permitted dischargers and land use coverage
- ⇒ Evaluated data against permit discharge limits
- ⇒ Discussed the probable sources of ammonia with the workgroup

The initial analysis was then presented to and discussed with the stakeholders workgroup in July 2005 in a meeting held at the

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2005 Basin Highlights

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Neches River Saltwater Barrier.

Originally proposed sources of the elevated concentrations of ammonia included agricultural runoff from fertilized fields, contamination from storm water runoff from urban areas, excessive ammonia in the discharge from the City of Beaumont wastewater treatment plant, or the possibility that elevated ammonia levels are a natural occurrence of the segment.

A review of the data found that high ammonias did not correlate to the agricultural growing season. Furthermore, Hillebrandt Bayou is the primary outfall for the City of Beaumont's storm water. Data compared to storm water events showed no significant impact from urban run off. These analysis eliminated land use, either agricultural or development as the major contributing source of ammonia.

The City of Beaumont's Wastewater Treatment outfall is the major permitted discharger in the segment. Data collected below the outfall has been consistently above the screening level. Even though this would seem to be an obvious contributor, an assessment of data that was collected upstream of the City of Beaumont's discharge during 1997 and 1998 showed results consistently at or above screening levels as well. More specific data collection will be needed to better define the wastewater plants role in contributing to the ammonia load in Hillebrandt Bayou.

Data collected on Hillebrandt Bayou at Humble Road over the last five years has resulted in 64% of the data exceeding the screening level of 0.16 mg/L. The following chart shows annual mean ammonia results plotted against the screening level at LNVA's Humble Road site.

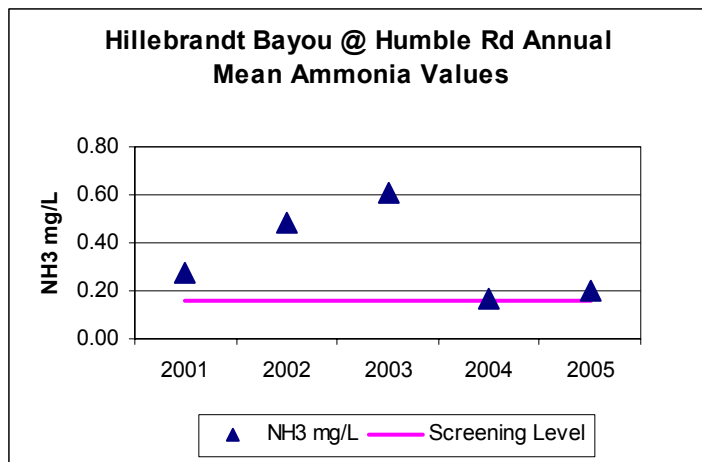


Table 2. Hillebrandt Bayou @ Humble Rd. Ammonia Values

After discussing this issue with the workgroup in July 2005 it was decided that more monitoring would be necessary upstream of the City of Beaumont's discharge to provide adequate coverage in the segment. To address this, LNVA added a routine monitoring station in September 2005 on Hillebrandt Bayou at SH 124, while the USGS and TCEQ will continue to monitor downstream at Humble Road and Hillebrandt Road, respectively. Collection will be bi-monthly in order to gather sufficient data within the next two years, at which time this issue will be re-evaluated to determine if a source can be defined. If this condition is natural it may

be necessary to reassess the State's stream standards for this segment.

Elevated Concentrations of Dissolved Metals

As mentioned in previous reports, assessments of dissolved metals in water data have raised some concerns at many sites in the LNVA assessment area. The most notable of these metals is aluminum. Based on the last ten data points collected, aluminum values have exceeded the maximum acceptable criteria (991 µg/L) 20% to 80% of the time at 13 sites; although, only one of these stations were listed as a concern for aluminum on the 2004 303(d) list. LNVA anticipates that the 2006 list of impaired waterbodies may include additional segments for metals in water after assessing the most recent data.

Aluminum is a common element in clay and clay soils which are prevalent throughout Southeast Texas. The screening level for Aluminum is 991 parts per billion. The following are the results of LNVA's screening of aluminum data analyzed by Albion Environmental between July 2002 –July 2005:

- ⇒ Six sites in the Pine Island Bayou watershed exceeded the screening level in 40% to 80% of samples
- ⇒ Five sites in the Village Creek watershed exceeded the screening level in 20% to 50% of samples
- ⇒ One Neches River site exceeded the screening level in 40% of samples
- ⇒ The Lone Taylor Bayou site exceeded the screening level in 70% of samples

Table 3 shows a positive correlation between aluminum content in the water column and the suspended clay sediment as measured by turbidity. The trend represented in Table 3 is typical of the other stations with aluminum concerns.

Another dissolved metals concern is the non-support of lead, based on the chronic lead criteria, in the Pine Island Bayou watershed. This concern is based on five years of lead data collected at six sites in the Pine Island Bayou watershed. The average lead values range from 0.8 to 2.1 µg/L, which are above the chronic screening level of 0.63 µg/L.

While sources of lead are not as easily identified as aluminum, some possible sources are listed below:

- ⇒ Paint chips/dust from buildings, bridges, etc.
- ⇒ Industrial emissions
- ⇒ Illegal dumping of trash

With changes in the past few years in the way metals samples are collected and evaluated LNVA has observed significant variances in the current results relative to historic data collection efforts. Through detailed evaluation, the use of split samples, and strict QA/QC procedures, to assure the accuracy of our metals database, LNVA has assured confidence in recent findings. Most recently Aluminum and Lead have surfaced as issues of concern

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2005 Basin Highlights

(Continued from page 3)

within the watershed, but historic concerns over Cadmium and Zinc are no longer an issue in the area.

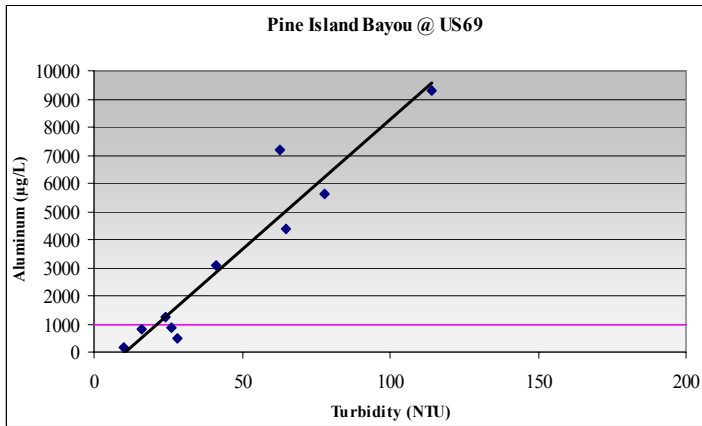


Table 3. Aluminum vs. Turbidity based on data collected at Pine Island Bayou at U.S. 69 from July 2002 to July 2005

Academy of Natural Science Study on the Neches River

As a follow up to the 2005 Basin Highlights Report topic concerning the Academy of Natural Sciences' Patrick Center for Environmental Research's study of the lower Neches River, it should be noted that the report remains in draft form. A series of comments and revisions have been made and a final version of the report

detailing findings of the 2003 Neches River study is expected in the near future. It should be noted that funding for sample analysis during the study was provided by the Clean Rivers Program. Other sponsors include LNVA, Jefferson County Waterway & Navigation District, Exxon Mobil, and DuPont. As previously stated the overall conditions of the water quality were good and supporting a healthy biological community.

Hurricane Rita Devastates the Basin

On September 24, 2005 the most intense tropical cyclone ever recorded in the Gulf of Mexico made landfall as a Category 3 hurricane near the Texas-Louisiana border. Hurricane Rita caused \$10 billion in damage on the Gulf Coast and across Southeast Texas. The storm killed seven people directly and many others died in evacuations and from indirect effects.



Church in Beaumont with roof ripped off by Hurricane Rita. Photo by Steve Buser.

The Golden Triangle area (Beaumont, Port Arthur, Orange) sustained enormous wind damage. In Beaumont, an estimated 25% of the trees in the heavily wooded neighborhoods were uprooted. An enormous number of houses and businesses suffered extensive damage from wind and falling trees. The water treatment plant in Port Neches was heavily damaged. Some areas did not have power for more than six weeks. A mandatory evacuation was issued in the area before Rita's landfall. The Golden Triangle was spared the more devastating storm surge by Rita's slight eastward turn just before landfall. As the storm continued inland, it passed through the Big Thicket National Preserve, Jasper and the Sam Rayburn Reservoir where it turned to the north. Major wind and tree damage was reported in the Jasper and Lake Sam Rayburn areas. Power outages extended to the Lufkin and Nacogdoches areas.

The Neches River and its tributaries were impacted greatly by the storm. In addition to the heavy rainfall and runoff, the Neches River was inundated with debris and waste from storm damaged areas throughout the basin. Major fish kills were reported in the lower Neches River from Sabine Lake to the Saltwater Barrier and up to "Dam B" at the B.A. Steinhagen Lake. Other fish kills were reported in Village Creek and Pine Island Bayou. Anoxic conditions (dissolved oxygen < 1 mg/L) were prevalent in the Neches River and Pine Island Bayou for two weeks following the storm. Acidic conditions were also documented in the river due to the vast amounts of organic matter and debris generated by the storm.



Figure 2. Seining the banks of the Neches River

Water Quality Monitoring

LNVA works in conjunction with the Texas Commission on Environmental Quality's (TCEQ) Region 10 office in Beaumont to perform water quality monitoring in twelve different classified segments of the Lower Neches River Basin (basin 6) and the Neches-Trinity Coastal Basin (basin 7). The U.S. Geological Survey (USGS) monitors eight sites in the area scattered over four segments. For details of water quality results see *Water Quality Conditions* on pages 7-10.

Routine Monitoring

LNVA's routine monitoring program provides baseline data for the Lower Neches River watershed and its tributaries. The monitoring plan includes 18 sites for fiscal year 2006 to provide adequate coverage in the basin. The data is collected on a quarterly basis at each station and is used to identify problems and concerns within each segment.

The 18 routine sites and station ID's are listed below:

- #10669 Taylor Bayou @ Labelle Rd.
- #10687 Hillebrandt Bayou @ SH 124
- #15346 Little Pine Island Bayou @ SH 326
- #15343 Neches River near Lakeview
- #10607 Pine Island Bayou @ Old Sour Lake Rd
- #15367 Pine Island Bayou @ FM 770
- #15345 Willow Creek @ Unnamed Rd near Nome
- #10599 Pine Island Bayou @ LNVA 1st Lift
- #10602 Pine Island Bayou @ US 69/96/287
- #10484 Sandy Creek @ FM 777
- #15344 Wolf Creek @ FM 256
- #10610 Angelina River @ Sh 63
- #13625 Village Creek @ FM 418
- #15355 Beech Creek @ FM 1943
- #15356 Turkey Creek @ FM 1013
- #15349 Hickory Creek @ US 69
- #15353 Big Sandy Creek @ US 190
- #10581 Neches River @ FM 1013

Monitoring Parameters

The 18 sampling sites mentioned above are sampled quarterly for field and conventional parameters. Metals in water are also collected at each station bi-annually. Parameters included in each group are listed below. For an explanation of each parameter, see *Sampling Parameter Descriptions* on page 11.

Systematic Monitoring

This type of monitoring is a more intense collection of data for a parameter of concern. Systematic monitoring for fiscal year 2005 included 24 hour DO collection at Little Pine Island Bayou @ SH

FIELD PARAMETERS	CONVENTIONALS	METALS IN WATER
Conductivity	Chloride	Aluminum
Dissolved Oxygen	E. coli	Arsenic
pH	Nitrogen (Ammonia, Nitrate, Nitrite)	Barium
Water Temperature	Sulfate	Cadmium
Secchi Depth	Total Alkalinity	Chromium
Stream Flows	Total Hardness	Copper
Total Dissolved Solids	Total Phosphate	Lead
Total Water Depth	Total Suspended Solids	Nickel
Pool Data	Turbidity	Selenium
Weather/Physical Observations		Silver
		Zinc

Table 4: List of LNVA Monitoring Parameters

326, Pine Island Bayou @ SH 770, SH 105, Old Sour Lake Road and US 69 in conjunction with the Use Attainability Analysis. LNVA will collect 24 hr DO measurements at these same stations in FY 2006. Collection will occur twice during the summer of 2006 concurring with the UAA.

Targeted Monitoring

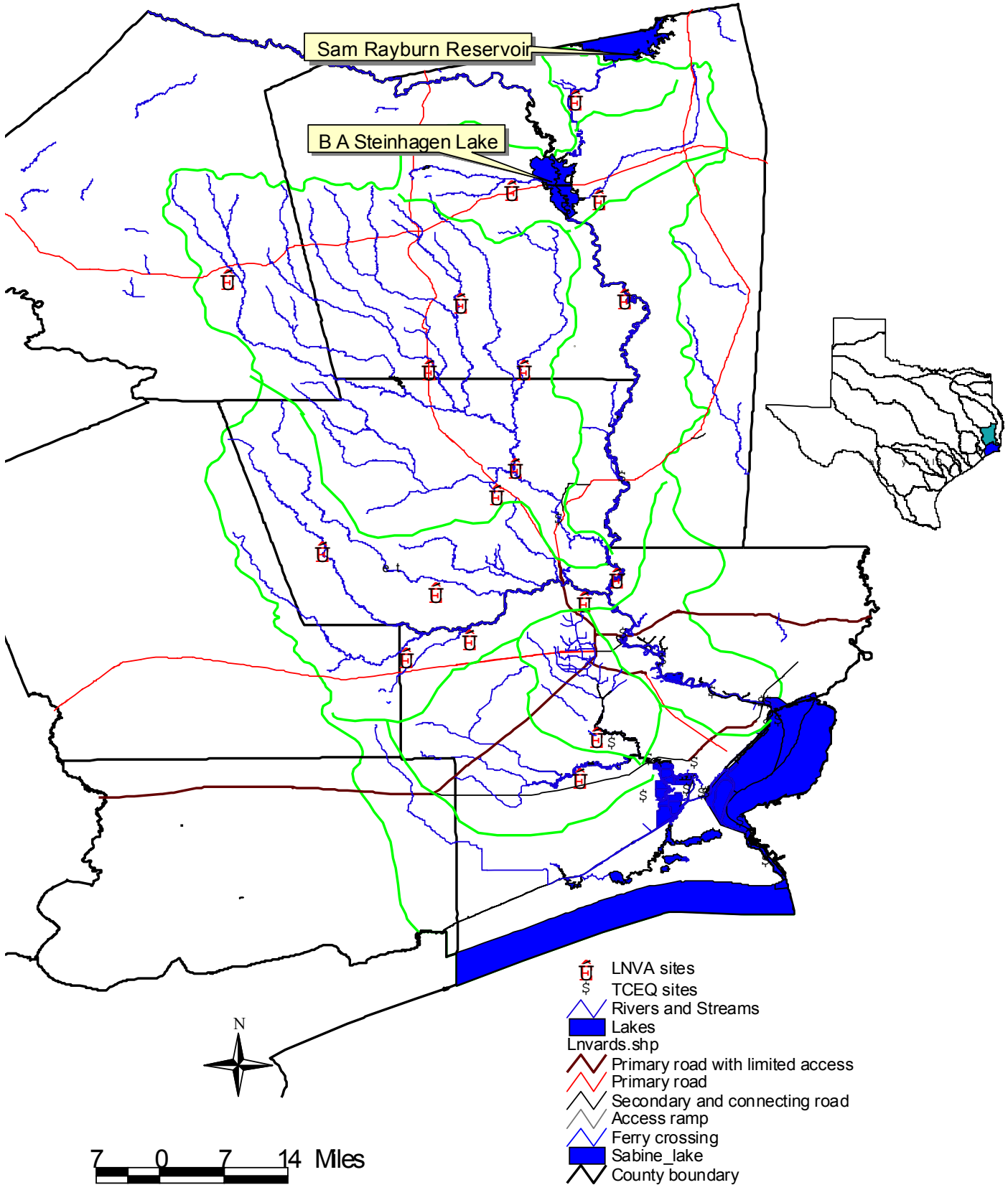
Targeted monitoring data is collected from receiving streams for the purpose of setting discharge permit limits. Targeted monitoring for fiscal year 2005 included flow and field collection at three sites in segments 602 and 608. These sites included Turkey Creek @ Willow St., Walnut Run, and an unnamed tributary to Cypress Creek upstream of the City of Kountze. This was the second year of collection at these sites; collected data has been submitted to TCEQ. Monitoring at these stations will be discontinued for FY 2006 as adequate data has been provided to reassess the limits for permitted dischargers to these streams.

Future Monitoring

LNVA, TCEQ, and USGS will all continue coordinated monitoring efforts in fiscal year 2006. Changes for LNVA in 2006 include dropping routine sites at Cypress Creek @ US 69 and Hillebrandt Bayou @ Humble Rd. to eliminate duplication of efforts. The USGS will be monitoring both of these sites as part of a special study. LNVA is adding a station on Hillebrandt Bayou at SH 124 to provide better coverage for assessing the ammonia-nitrogen concern in this watershed. 24 hour DO collection in Pine Island Bayou will remain flexible to accommodate the UAA and metals in water collection will resume a bi-annual schedule after being collected quarterly the last two years.

For more information on LNVA's monitoring schedule, go to <http://lnva.dst.tx.us> or visit the CRP statewide coordinated monitoring schedule at <http://cms.lcra.org/>.

Lower Neches Basin Map



Water Quality Conditions—Segment 602 & 603

The Texas Water Quality Inventory and 303(d) List is a comprehensive list of impairments found in the state’s basins. This document is published once every two years and is based on the most recent five years of data. Data is screened in accordance with the Guidance for Assessing Texas Surface and Finished Drinking Water Quality Data. Stations listed on the 303(d) signify concern for a certain parameter. These concerns are then prioritized for additional work.

A detailed list of concerns for segments monitored by LNVA is provided below. In addition to findings listed in the 2004 303(d), other concerns found by data assessments performed by LNVA on more recent data are also provided and will most likely be noted on the State’s 2006 water quality inventory.

Segment 602

Segment 602 includes the Neches River from a point 7.0 miles upstream of IH-10 in Orange/Jefferson County to Town Bluff Dam in Jasper/Tyler County. Based on the 303(d) list and LNVA’s own data assessment there is a concern for aluminum (acute) in this segment. The last ten data points collected on the Neches River at FM 1013 exceed the aluminum criteria 40% of the time. However, aluminum is a naturally occurring element in the clay soils found in this area. LNVA will continue to monitor dissolved aluminum in the segment.

Below is a list of findings in Segment 602:

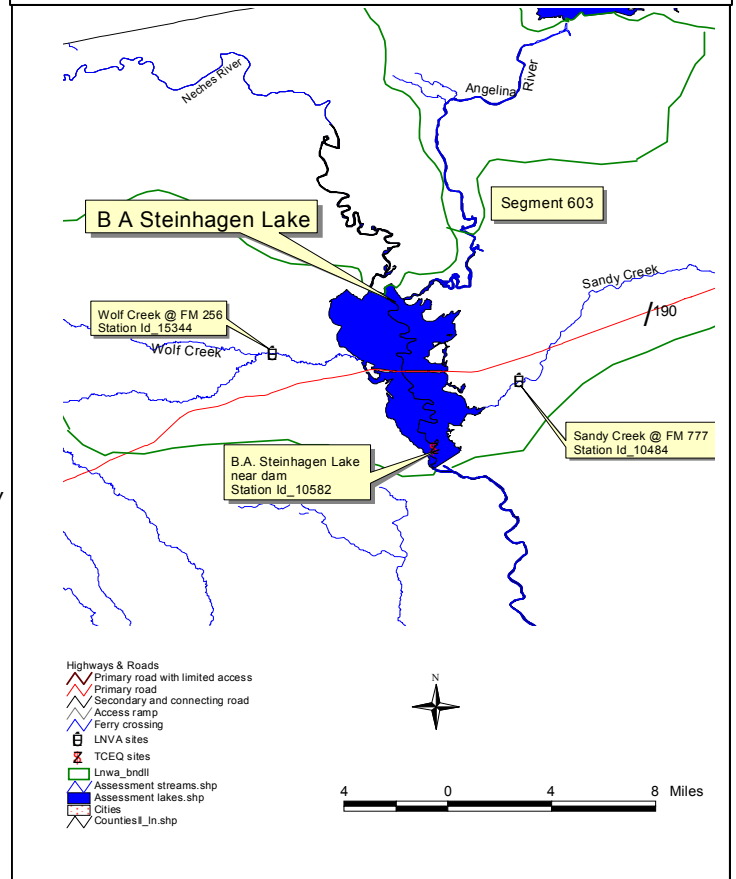
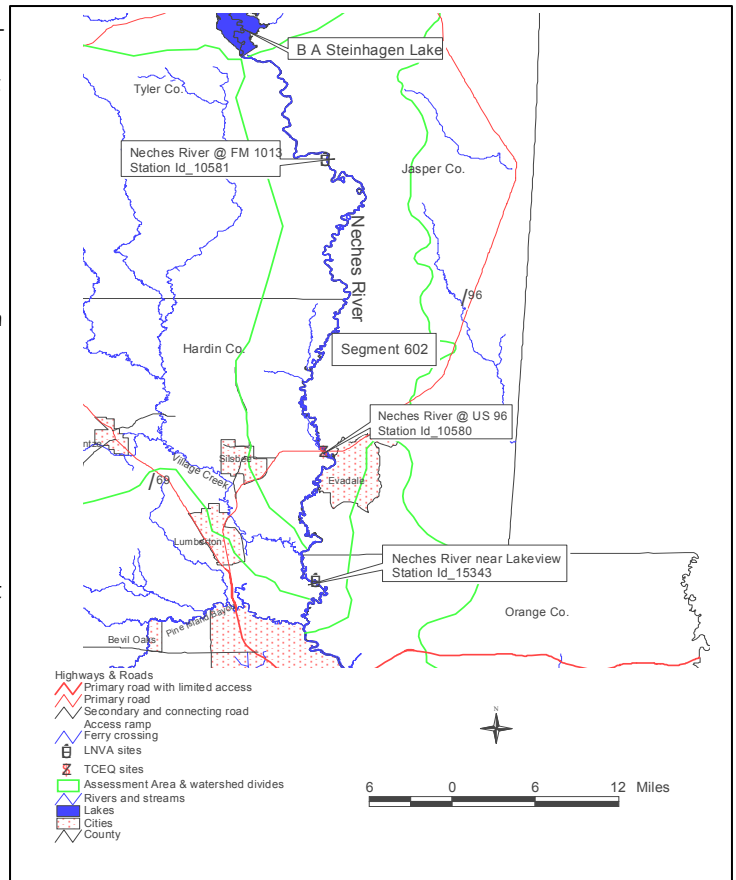
- ⇒ Aluminum (acute) levels exceed the screening limit at station 10581
- ⇒ Fully supports the contact recreation use
- ⇒ Fully supports the general criteria.
- ⇒ There are no nutrient concerns in this segment

Segment 603

B.A. Steinhagen Lake constitutes the segment up to the normal pool elevation of 83 feet. Major tributaries to the segment include both the Angelina and Neches Rivers. LNVA monitors Sandy Creek and Wolf Creek in Segment 603 for the Clean Rivers Program. TCEQ monitors one site near the dam on the main pool. The Texas Department of Health issued a fish consumption advisory in 1995 after elevated levels of mercury were found in large-mouth bass, freshwater drum, white bass or hybrid/striped bass. This segment is on the 303(d) as a moderate priority for a TMDL due to mercury in fish tissue. The elevated levels of E. coli in Sandy Creek are likely due to non-point sources. LNVA will continue monitoring E. coli bacteria in the segment.

Below is a list of findings in Segment 603:

- ⇒ Fully supports the aquatic life use
- ⇒ Not supporting the contact recreation use at Sandy Creek for elevated E. coli levels
- ⇒ Concerns for mercury in fish tissue
- ⇒ There are no nutrient concerns in this segment



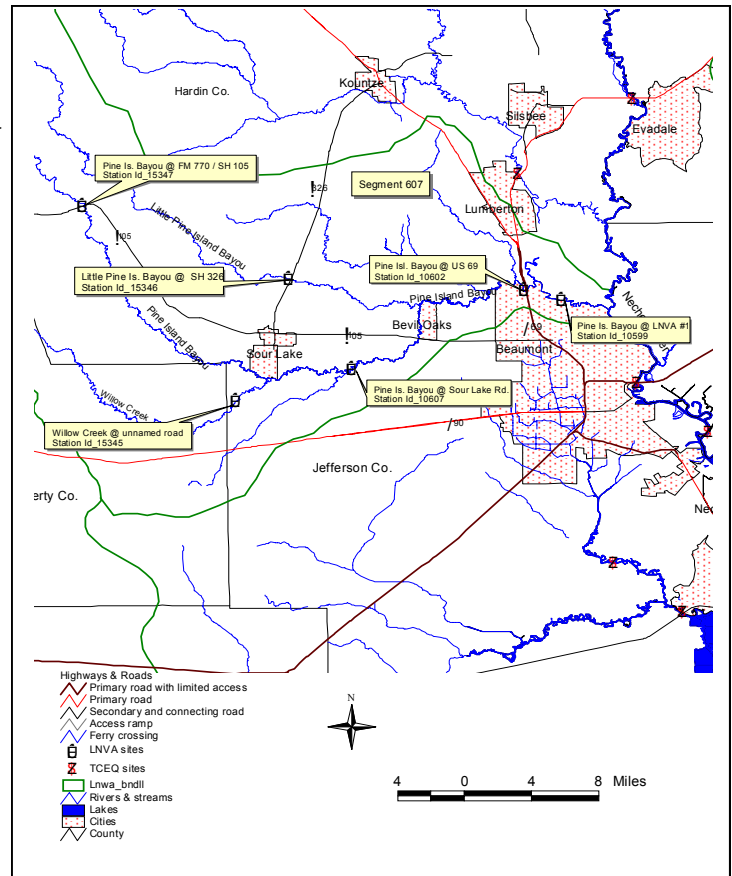
Water Quality Conditions—Segment 607 & 608

Segment 607

This segment consists of low gradient, sluggish streams with discharge subject to seasonal variance in rainfall. The primary waterbodies in this segment include Pine Island Bayou, Little Pine Island Bayou, and Willow Creek. Previous data assessments have found concerns for bacteria, pH and dissolved oxygen (DO). Low DO values persist throughout the segment. TCEQ has initiated a Use Attainability Analysis (UAA) to determine if the current DO stream standard is appropriate. Recent data screened by LNVA shows Aquatic Life Use concerns exist for aluminum (acute) and lead (chronic) throughout the segment. Dissolved aluminum and lead will continue to be monitored by LNVA in the segment.

Below is a list of findings in Segment 607:

- ⇒ All stations in this segment are not supporting the aquatic life use based on the dissolved oxygen criteria
- ⇒ All stations in this segment are impaired with respect to the acute aluminum and chronic lead criterion
- ⇒ General criteria is fully supported
- ⇒ There are no concerns for nutrients in this segment

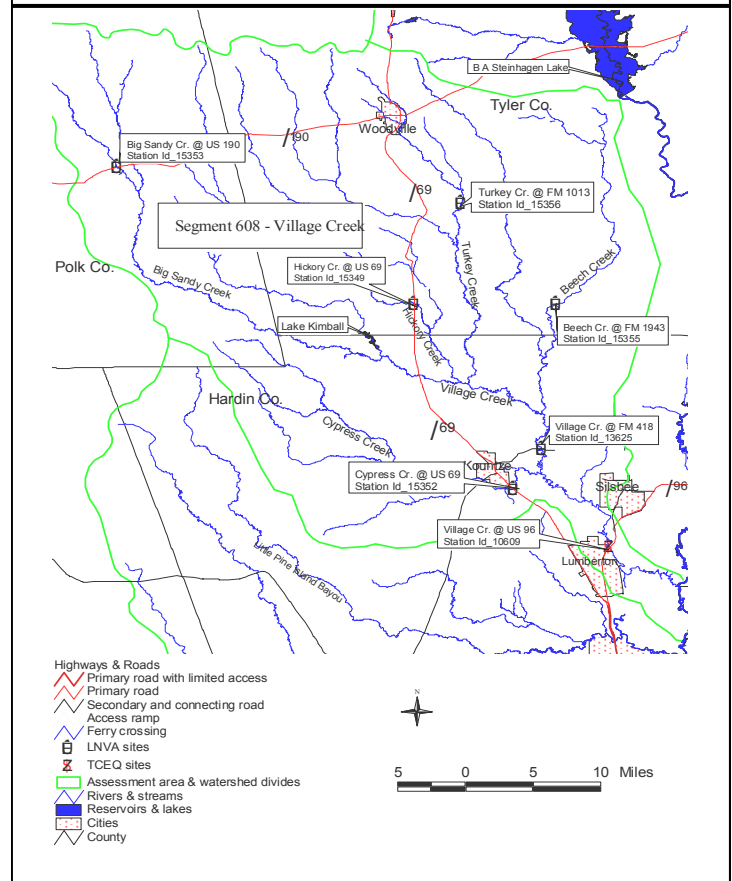


Segment 608

The Village Creek watershed is approximately 1,113 square miles with LNVA monitoring five sites, one on the segment and four off the main segment. Recent data assessments found concerns for pH, dissolved oxygen (DO) and bacteria. The pH and DO concerns are likely due to natural conditions. Factors contributing to elevated bacteria are inconclusive. LNVA's most recent data assessment shows concerns for the aquatic life use due to exceedances of the metals in water criteria at most of the stations in this segment. LNVA will continue monitoring dissolved metals in the segment.

Below is a list of findings in Segment 608:

- ⇒ Site 15352 on Cypress Creek does not support the high aquatic life use based on failure to meet the DO, chronic lead, and acute aluminum criteria.
- ⇒ Stations 15353 and 15356 do not support the contact recreation use due to bacteria levels.
- ⇒ Sites 15356, 15355, 13625 and 15349 are impaired based on failure to meet the acute aluminum criteria
- ⇒ Site 13625 on Village Creek partially supports the general criterion for pH
- ⇒ There are no concerns for nutrients in this segment



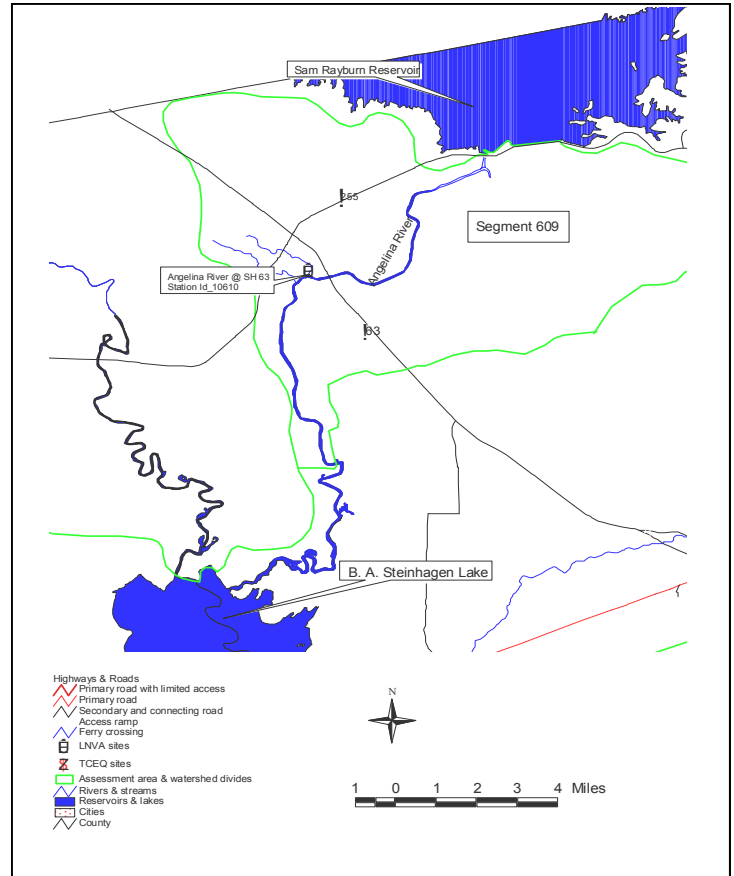
Water Quality Conditions—Segment 609 & 701

Segment 609

The Angelina River below Sam Rayburn Reservoir begins at the Sam Rayburn Dam in Jasper County and continues to a point immediately upstream of the confluence of Indian Creek in Jasper County. The water quality in this segment is very good and all uses are fully supported. Historical assessments have indicated a possible concern for low dissolved oxygen (DO) concentrations. However, more current data analysis has indicated full support of the DO criteria in this segment.

Below is a list of findings in Segment 609:

- ⇒ Fully supports all the designated uses
- ⇒ Fully supports the general criteria
- ⇒ No concerns for nutrients in this segment

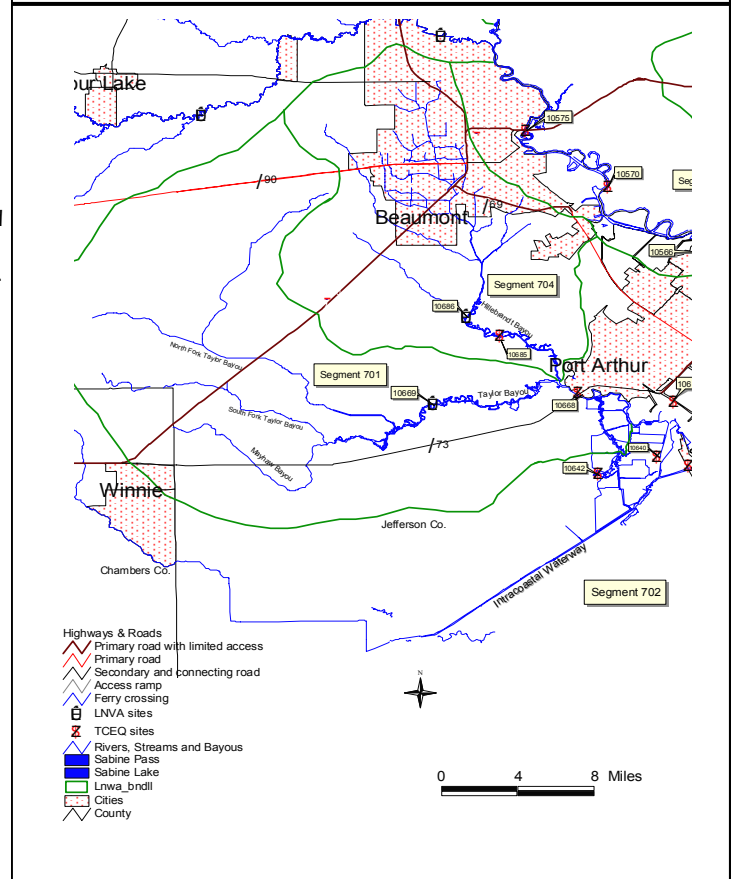


Segment 701

Taylor Bayou is located in the Neches-Trinity Coastal Basin and flows from the LNVA canal in Jefferson County to the saltwater lock 4.8 miles downstream of SH 73 in Jefferson County. The waterbody is relatively deep (8-13 ft.) and low gradient with sluggish flow. Most current data screenings are indicating the segment partially supports the aquatic life use for dissolved oxygen (DO). Other findings in this segment include concerns for aluminum in water and chlorophyll a. LNVA will continue monitoring dissolved aluminum in the segment. Diurnal monitoring, 24-hour DO measurements, in the segment will be considered by LNVA for FY 2007.

Below is a list of findings in Segment 701:

- ⇒ Site 10669 and 10668 partially support the aquatic life use based on failure to meet the DO criteria
- ⇒ Site 10669 on Taylors Bayou is not supporting its aquatic life use based on failure to meet the acute aluminum criteria
- ⇒ Concern for chlorophyll at station 10668
- ⇒ Fully supports the contact recreation use
- ⇒ Fully supports the general criteria



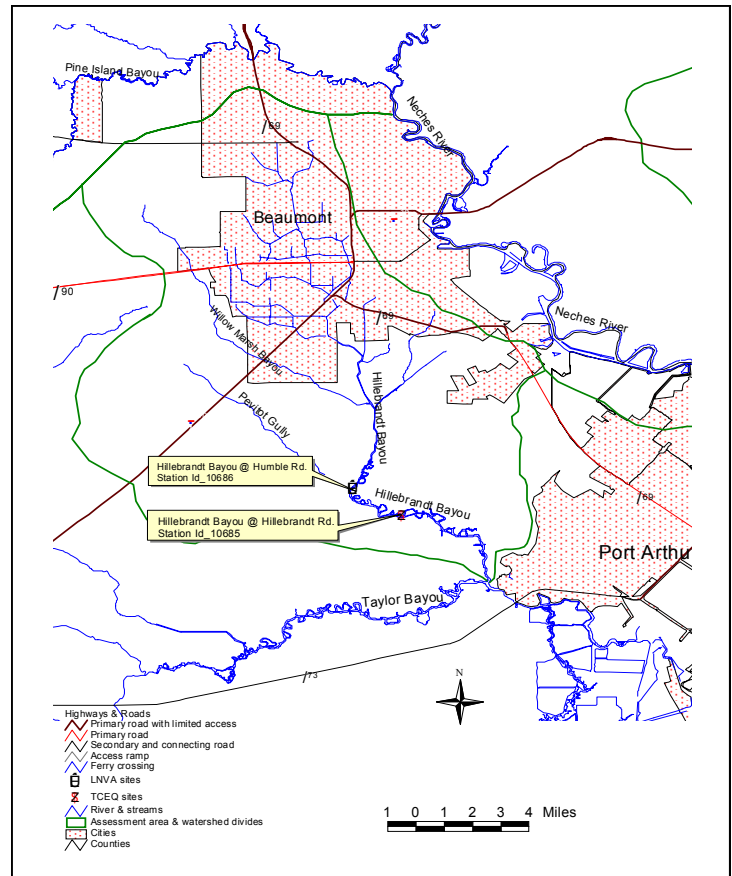
Water Quality Conditions—Segment 704

Segment 704

Hillebrandt Bayou receives storm runoff from approximately 68% of the City of Beaumont. Tributaries carry additional flows from agricultural areas, with base flow contributed from the City of Beaumont's wastewater treatment operations. Assessment reports indicate the segment partially supports the aquatic life use based on dissolved oxygen levels at site 10685 where Hillebrandt Bayou intersects Hillebrandt Rd. There is also a concern for elevated ammonia-nitrogen levels. As a result of discussions with the Hillebrandt Bayou Stakeholder Workgroup, LNVA has added a routine monitoring station to provide appropriate monitoring coverage and adequate data to better assess the ammonia concern.

Below is a list of findings in Segment 704:

- ⇒ Site 10685 partially supports the aquatic life use based on failure to meet the dissolved oxygen criteria
- ⇒ Fully supports the contact recreation use
- ⇒ Fully supports the general criteria
- ⇒ Concern for nutrient enrichment of ammonia-nitrogen and chlorophyll



Stakeholder Participation and Public Outreach

The Lower Neches Valley Authority's Clean Rivers Program (CRP) stakeholder participation and public outreach program includes several activities and events that ensure the public understands the role they play in protecting water resources. Public involvement is essential to ensuring the Clean Rivers Program meets its goals for water quality.

CRP Steering Committee

The CRP Steering Committee is integral to LNVA's involvement with the public for the Clean Rivers Outreach Program. LNVA's CRP Steering Committee brings together representatives of the local industrial, municipal, and agricultural communities to discuss water quality issues. This diverse group of stakeholders represents a variety of interests and helps identify the needs and concerns throughout the basins.

The main objectives of the committee are to help with creation of realistic water quality goals, review and develop work plans, share resources, and establish monitoring priorities. Members voice any local or regional concerns they may have, while considering the interests of the basin as a whole. The CRP Steering Committee meets publicly at least once a year and discusses a wide range of topics.

Topics highlighted at the 2005 meeting:

- ⇒ Shifting the focus of monitoring more towards problem areas
- ⇒ Increase public awareness of CRP in our basin
- ⇒ Purchasing of GIS software and other monitoring equipment
- ⇒ Update on Pine Island Bayou UAA, Village Creek, and Hillebrandt Bayou concerns

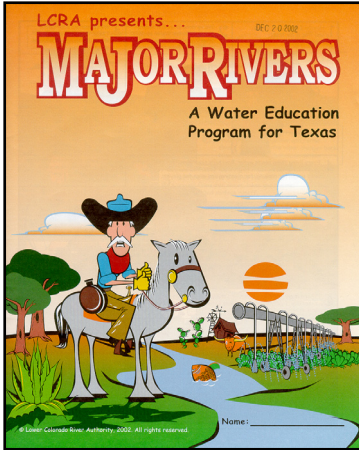


For more information on LNVA's CRP Steering Committee, how to become involved, or when the meetings are scheduled, visit LNVA's website at <http://lnva.dst.tx.us> or call (409) 898-0561.

The annual Neches Basin Coordinated Monitoring Meeting at the LNVA Conference Center is attended by stakeholders in the upper and lower basin.

Outreach Events and Programs

The Clean Rivers Program and LNVA sponsored book covers for the 2005-06 school year for area school district's elementary schools. The book covers provide educational word games and puzzles on the subject of water quality.



The Major Rivers Program has presented an opportunity for local youth to study different water issues. Major Rivers is designed to help fourth grade students learn about Texas' major water resources, how water is treated and delivered to their homes and schools, and how to care for their water resources and use them wisely. For the 2005-06 school year, LNVA delivered Major Rivers to approximately 2,250 area 4th graders.

The CRP lends its hand in learning to all ages. Last year, members of the U.S. Army Corps of Engineers, as well as Lamar University students, had the opportunity to tour the LNVA laboratory.

By continuing to keep the public involved in the Clean Rivers Program, LNVA is ensuring that its program will be successful and achieve its water quality goals. To learn more about LNVA's programs and events, please visit www.lnva.dst.tx.us or call us at (409) 898-0561.

Sampling Parameter Descriptions

Alkalinity – measures the buffering capacity of water which helps a solution resist changes in pH caused by the addition of an acid or base thereby maintaining an appropriate pH range for aquatic habitat

Bacteria – Measures the amount of pathogens (E. coli in fresh water, Enterococci in marine water) present in the water

Chlorides – measures the ionized, water soluble form of chlorine present in the water

Chlorophyll-a – The photosynthetic pigment found in all green plants, algae, and cyanobacteria, the concentration is used to estimate phytoplankton biomass in surface water

Conductivity – is the measure of electrical current carrying capacity of water and is used to measure the amount of dissolved solids and salts in the water

Dissolved Oxygen (DO) – the amount of oxygen available to aquatic organisms and is the single most important indicator of a water body's ability to support desirable aquatic life

Hardness – measures divalent ions, salts such as calcium and magnesium, in association with carbonates

Metals – (Aluminum, Arsenic, Barium, Cadmium, Chromium, Cop-

LNVA Web Site

www.lnva.dst.tx.us

LNVA is the CRP data clearinghouse for the lower Neches River Basin and Neches-Trinity Coastal Basin and maintains a web page for easy public access. This web site not only includes information about LNVA and its current projects, but it also is a source of information for the Clean Rivers Program.

As the data clearinghouse for the Clean Rivers assessment area, water quality data are available on the web site. When the LNVA page is accessed, users can query the Clean Rivers Program data through a list of monitoring stations. The user can select the query results as raw data or summary statistics. Clean Rivers Program data are updated twice a year.

In addition to water quality monitoring data, the Clean Rivers section of the website also includes:

- ⇒ The Quality Assurance Project Plan
- ⇒ Coordinated Monitoring Schedule
- ⇒ Past Basin Highlights Reports and Summary Reports
- ⇒ Meeting Announcements
- ⇒ Special Studies
- ⇒ Links to outside resources

per, Lead, Nickel, Selenium, Silver, and Zinc) – certain metals have been found to bioaccumulate in the tissues of fish making them unsafe to eat – metals may be found in water and sediment

Nitrogen (Ammonia, Nitrate, Nitrite) – measures the nutrient levels in the water related to the decomposition of organic material

pH – measures the acidity of the water which affects the solubility, and therefore the toxicity, of chemicals and metals

Secchi Depth – measures the clarity or transparency of water

Sulfate – measures the amount of water soluble sulfur present in the water

Total Dissolved Solids – measures the amount of minerals, salts, metals, cations or anions dissolved in the water

Total Phosphorus – measures all chemical forms of phosphorus

Total Suspended Solids – measures the amount of all particles suspended in water that will not pass through a filter

Turbidity – measures the clarity or cloudiness of the water

Water Temperature – affects the metabolic rates of aquatic organisms and plants