2018

BASIN HIGHLIGHTS REPORT

Lower Neches River Basin &
Neches-Trinity Coastal Basin

Lower Neches Valley Authority

THE TEXAS CLEAN RIVERS PROGRAM

PREPARED IN COOPERATION WITH THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

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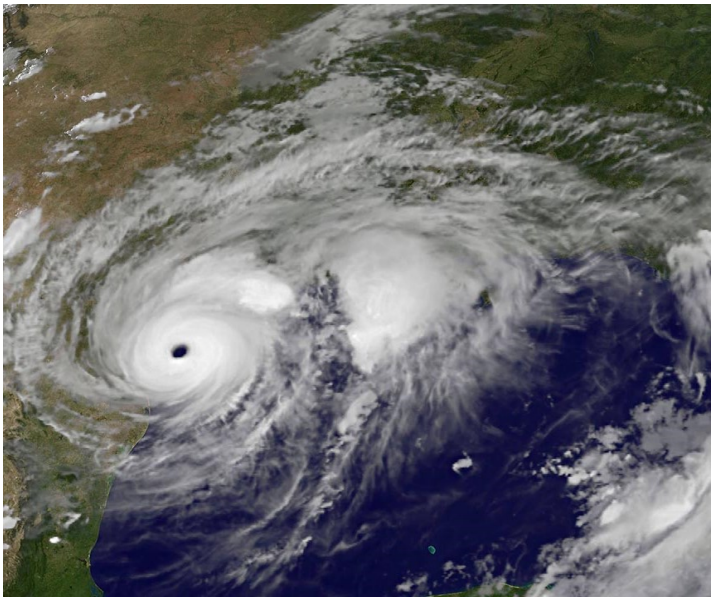
Lower Neches Basin Highlights

Hurricane Harvey : The Storm

What began as a typical tropical storm in the middle of August, transformed into one of the most catastrophic storm events ever recorded. Hurricane Harvey made landfall as a category 4 hurricane near Rockport, Texas on Friday August 25, 2017. A second landfall was made west of Holiday Beach three hours later. It quickly downgraded to a tropical storm but the center of the storm remained on the Texas coast for the next four days allowing Harvey to dump historical amounts of rainfall over southeastern Texas. The National Hurricane Center reported over 60 inches of rainfall in one 24 hour period at its peak. Harvey made a final landfall over southwestern Louisiana before becoming a tropical depression on August 30th. The rain continued as Harvey moved into the Tennessee Valley. Here, the storm turned into an extratropical cyclone. Extratropical cyclones have cold air at their core, and derive their energy from the release of potential energy when cold and warm air masses interact. These storms always have one or more fronts connected to them, and can occur over land or ocean. They drive the weather over much of the Earth and are capable of producing anything from cloudiness and mild showers to heavy gales and thunderstorms. What was left of Hurricane Harvey finally dissipated over Kentucky on September 1st. At least 68 people were killed as a result of this storm. It is being reported as the second most costly hurricane in US history, behind Hurricane Katrina in 2005. The effects of this storm are still being felt nine months later and will probably continue for years to come. As of April 2018, all counties in the Lower Neches River Basin and Neches –Trinity Coastal Basin still remain under the August 2017 disaster declaration enacted by Governor Greg Abbott.



NASA image of Hurricane Harvey as it made landfall off the Texas Coast as a Category 4 hurricane.

Bridge approach washout on Hwy 96 near Village Creek .

Community Impacts

After Harvey, it took almost a week in some areas for the flood waters to recede. Many major roadways remained impassable. This included a portion of Highway 96 were it approaches Village Creek between Lumberton and Silsbee. (pictured above). A section of the highway collapsed due to erosion caused by the flood waters. The City of Beaumont lost its primary and secondary sources of drinking water and citizens were required to boil water for several weeks. As of October 2017, FEMA approved a total of 372,973 Individual Assistance Applications. The dollar amount for individual and household programs was $1,611,230,889.61. Total Public Assistance Grant dollars obligated were $644,247,219.86. Both dollar amounts are as of October 2017 as well. These totals don't include the homeowners or business owners that had flood insurance and did not qualify for assistance from FEMA. There are still people that are displaced from their homes or in the process of trying to rebuild their homes. In the interim period between infrastructures stabilizing, LNVA staff were able to help with demolition work on some of the homes in the community. This involved removing personal belongings, appliances, cutting out sheet rock, pulling out carpet and cabinets, and removing furniture that had come in contact with the flood waters. It only takes a few days for mold to begin to grow once flood waters have receded and since many were unable to get in their homes for up to a week, very little was salvageable depending on the water depth. As a result of so many homes and businesses affected by the flooding, the streets in the area were lined with debris

(Continued on page 3)

Lower Neches Basin Highlights

piles. In some areas, there are still problems with left over debris. A number of the state parks in the basin have damage as well. Harvey flood waters and flooding events in February and March of 2018 have portions of Village Creek State Park still closed to the public as repairs are being made. The only portions of the park that are open to the public as of April 2018, are 25 campsites in the water and electric camping area, the dump station, the restrooms, the park office, and the nature center. The rest of the park could be closed until the end of 2018.

LNVA Neches 1st Pumping Station flooded by the Neches River.

Impacts: LNVA and the Environment

Several of LNVA's facilities were significantly impacted by the flood waters of Hurricane Harvey. One of these facilities was the main pumping station responsible for getting water from the Neches River to water customers. Once the flood waters receded, staff worked around the clock to make to make sure this plant was operational when the need for water from industry and municipalities came. The Saltwater Barrier facility that is home base for LNVA's water quality lab and the Clean Rivers Program (CRP) was also affected heavily by water damage. The entire lab as well as the barrier office had to be torn out and rebuilt. Chemicals and equipment contaminated by the flood waters had to be disposed of and re-ordered. The CRP sampling planned for the quarter of September through November of 2017 was unable to be performed. CRP sampling began again in February 2018.

LNVA Saltwater Barrier Office (left) and boathouse (right) during the flooding from the Neches River caused by Hurricane Harvey.

CRP staff had the opportunity to see damage remaining from Harvey during the February sampling event. The most visible impacts in the lower Neches basin were scattered debris at sampling locations and heavy tree damage.

Drainage systems were not prepared for the amount of rainfall that fell in such a short amount of time. Opened septic systems, more than normal storm water runoff, chemical runoff, oil runoff, large debris and other sources of pollution could have had impacts in the basin. The results from the data collected during sampling events will be key in determining if there are any lasting impacts from the storm and to what degree.

Demo taking place in the LNVA water quality lab.

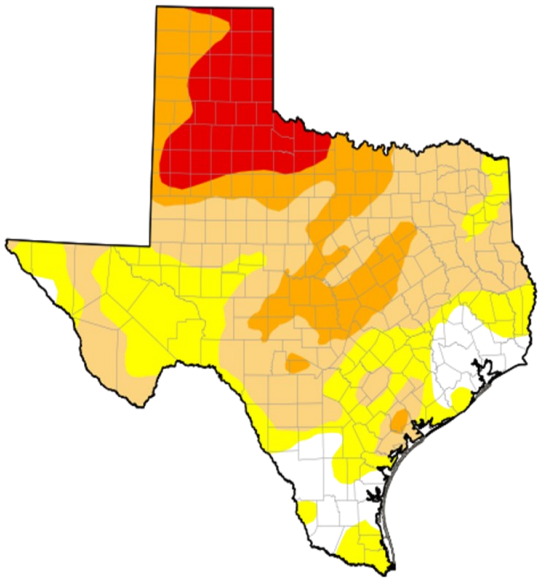
Demo completed on the LNVA water quality lab.

Snow in the Lower Neches Basin

Another weather phenomenon rarely seen in the Lower Neches Basin was snow. Counties in the Lower Neches Basin received 1-2 inches of snow in the early part of December 2017. Many area schools were closed for safety in anticipation of icy road conditions.

Lower Neches Basin Highlights

Drought Conditions in Texas for 2017

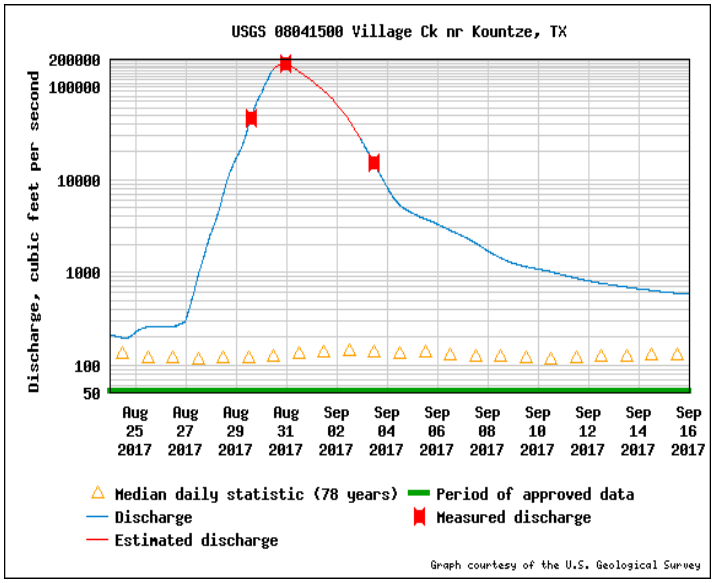


	D0-Abnormally Dry	90.24% of Texas
	D1-Moderate Drought	64.88% of Texas
	D2-Severe Drought	29.56% of Texas
	D3– Extreme Drought	11.79% of Texas
	D4-Exceptional Drought	0.00% of Texas
	D5– No Drought	9.76% of Texas

It isn't surprising that much of the Lower Neches Basin and the area around the Neches Trinity coastal Basin sites were in a 'no drought' condition. Hurricane Harvey combined with normal precipitation have rainfall totals almost double than normal in some places.

According to National Oceanic and Atmospheric Association (NOAA) observed precipitation data for 2017, rainfall totals in the basin ranged from 70-100 inches. The drought monitor classes shown in the chart are cumulative. This means if a region is in D2 for severe drought, it is also in D0 and D1. The percentages represent these cumulative values. Areas of the basin that appear to be in the D0 abnormally dry class may technically not be so. D0 represents a transition into and out of drought conditions. The map is a reflection of rainfall and soil moisture deficits and doesn't necessarily indicate water-supply status. The Texas map summarizes January 1, 2017 through December 31, 2017. This information is courtesy of the Texas Water Development Board and the waterfortexas.org website.

The graph below courtesy of the U.S Geological Survey (USGS) shows the water discharge in cubic feet per second on Village Creek during Hurricane Harvey. The discharge measured between August 30, 2017 through September 2, 2017 discharge values are estimated by USGS.



Long –Term Deployment Module Project Completed

In February of 2017, the LNVA and TCEQ in cooperation with Hydrotech ZS Consulting initiated the Long-Term Deployment Installation and Testing Project. This project involved incorporating a second YSI multi probe with the Pine Island Bayou continuous water quality monitoring network station (CAMS749) attached to a Long Term Deployment Module (LDM) developed by Hydrotech. The LDM is designed to reduce multi-probe fouling in continuous water quality monitoring applications by filling a chamber containing the sensors with a water sample and testing the water quality before emptying the chamber. An internal pump discharges the water sample until the chamber fills for the next measurement. As a result, the sensors are not exposed to ambient water and sunlight which promotes biological growth and fouling. Sensor and deployment tube fouling can compromise the quality of the data collected. The LDM project just recently reached its completion in February of 2018. If the LDM proves reliable, provides representative water quality measurements, and reduces fouling, the CRP program may continue to use the unit to collect data at the CAMS749 site. The benefits to this include improved water quality data, less frequent

Public Participation and Water Quality Monitoring Programs

station service visits, and eliminate the need to collect USGS based multi- probe/ deployment tube fouling measurements.

The Pine Island Bayou Continuous Water Quality Monitoring Network (CWQMN) station real-time data is available online at: https://www.tceq.texas.gov/cgi-bin/compliance/monops/water_site_photo.pl?cams=749.

Stakeholder Participation

LNVA's stakeholder participation process includes the basin steering committee. The steering committee consists of stakeholders representing local industry and municipalities, state and federal agencies, tribal groups, environmental groups, and the general public. A diverse basin-wide CRP steering committee insures that the different interests and priorities of each watershed are represented. The objectives of the committee are to assist with the creation of realistic water quality objectives and basin priorities, review basin water quality reports and recommended actions, and the establishment of monitoring priorities. Members are encouraged to voice any local or regional concerns they may have as well as to consider the interests of the basin as a whole. LNVA recently reached out to area organizations to expand the current membership of this committee to ensure the needs of the entire basin are being met.

For more information on LNVA's CRP Steering Committee and how to become involved, please contact LNVA at (409) 892-4011.

Public Outreach and Education

LNVA supports a dedicated group of volunteer monitors in the basin. As a partner in Texas Stream Team, LNVA provides water quality testing kits, supplies, and reagents to trained volunteers who are students, teachers, concerned citizens, and environmental stewards. Additional information about Texas Stream Team and how to get involved in the program is available on their website at the following link: http://txstreamteam.meadowscenter.txstate.edu/.

LNVA sponsors the Major Rivers curriculum which is designed to help 4th and 5th grade students learn about the major water resources in Texas, how water is treated and delivered to their homes and schools, and how to care for water resources and use them wisely.

LNVA also participated in the 2017 and 2018 Neches River Festival. This festival gave high schoolers in the area the opportunity to not only learn about organizations like Lower Neches Valley Authority but also about the Neches River and why it is so important to the area.

LNVA's web page provides an overview of the CRP statewide water quality program, and includes LNVA Basin Reports, Quality Assurance documents, CRP Workplan Summary, CRP Long-Term Plan, and links to important websites such as the Texas Stream Team Volunteer Monitoring Program, Texas Major Rivers Program, TCEQ Surface Water Quality Data Viewer, and Statewide Coordinated Monitoring Schedule (CMS).

Please visit our website at http://www.lnva.dst.tx.us/ to learn more about LNVA and the Clean Rivers Program.

Routine Water Quality Monitoring

Routine water quality monitoring is a major part of the Clean Rivers Program and provides important water quality data used to identify long-term trends and assess the overall water quality conditions in the river basin. Routine water quality monitoring parameters include the following:

Alkalinity measures carbonate/bicarbonate ions to determine the buffering or neutralizing capacity of water. Low alkalinity (<20 mg/L) water has a limited ability to resist changes in pH, therefore it's more susceptible to acidification and low pH.

Total Hardness measures calcium and magnesium ions as calcium carbonate (CaCO3). It's important when determining the toxicity of heavy metals on aquatic biota.

Nitrogen occurs in natural waters in various forms, including nitrate (NO3), nitrite (NO2), and ammonia (NH3).

Nitrate (NO_3) generally occurs in trace quantities in surface water. It is the essential nutrient for many photosynthetic autotrophs and has been identified as the growth limiting nutrient. When nitrate concentrations become excessive eutrophication and associated algal blooms can be become a problem.

Nitrite (NO_2) is extremely toxic to aquatic life, however it is usually present only in trace amounts in most natural freshwater systems because it is rapidly oxidized to nitrate. In sewage treatment plants using nitrification process to convert ammonia to nitrate, the process may be impeded, causing discharge of nitrite at elevated concentrations into receiving waters.

Ammonia (NH3) is one of the most important pollutants in the aquatic environment because of its relatively highly toxic nature and its ubiquity in surface water systems. It is discharged in industrial, municipal and agricultural wastewaters. Ammonia can also originate from natural

Water Quality Monitoring Programs

sources, including the breakdown of organic waste matter. It is an important source of nitrogen needed by plants and animals.

Organic nitrogen and ammonia can be determined together and are referred to as *Total Kjeldahl Nitrogen (TKN)*. Organic nitrogen is the byproduct of living organisms.

Phosphorus is often the limiting nutrient for plant growth, meaning it is in short supply relative to nitrogen. Phosphorus usually occurs in nature as phosphate. Phosphate that is bound to plant or animal tissue is known as organic phosphate. Phosphate that is not associated with organic material is known as inorganic phosphate. Both forms are present in aquatic systems and may be either dissolved in water or suspended.

Turbidity measures the cloudiness of water. Cloudiness is caused by suspended solids (mainly soil particles) and plankton (microscopic plants and animals) that are suspended in the water column.

Sulfate can be dissolved in many natural waters. Concentrations of this ion usually vary greatly from one watershed to another due to the natural availability in rocks and soils. Excessive amounts of sulfate can cause taste and odor problems in water treatment, and scaling in boilers and heat exchangers used for industrial purposes.

Chloride is found in all watersheds to some degree. Concentrations can vary naturally, usually increasing as the mineral content increases. Chlorides can also be introduced by sewage effluent and discharge from oil field activity.

Conductivity is a measure of how well water can pass an electrical current. It is an indirect measure of the presence of inorganic dissolved solids such as chloride, nitrate, sulfate, phosphate, sodium, magnesium, calcium, iron and aluminum. The presence of these substances increases the conductivity of a body of water.

Inorganic *Total Dissolved Solids (TDS)* are essential ingredients for aquatic life. They regulate the flow of water in and out of organisms' cells and are building blocks of the molecules necessary for life. A high concentration of total dissolved solids, however, can cause water balance problems for aquatic organisms and decrease dissolved oxygen levels.

Dissolved Oxygen (DO) in water is expressed as a concentration. The DO concentration in a stream is the mass of the oxygen gas present, in milligrams per liter of water. Milligrams per liter (mg/L) can also be expressed as parts per million (ppm).

The concentration of dissolved oxygen in a stream is affected by many factors. These include temperature, flow, aquatic plants, altitude, dissolved or suspended solids, human activities that affect DO and algal growth.

Summer is usually the most crucial time for dissolved oxygen levels because stream flows tend to lessen and water temperatures tend to increase. In general, DO levels less than 3 mg/L are stressful to most aquatic organisms. Most fish kills occur at1-2 mg/L. In some water bodies, fish can move away from low DO areas. Water with low DO from 2 – 0.5 mg/L are considered hypoxic; waters with less than 0.5 mg/L are anoxic.

pH is an important limiting chemical factor for aquatic life. If the water in a stream is too acidic or basic, the H+ or OH- ion activity may disrupt aquatic organisms biochemical reactions by either harming or killing the stream organisms.

pH is expressed in a scale with ranges from 1 to 14. A solution with a pH less than 7 has more H+ activity than OH-, and is considered acidic. A solution with a pH value greater than 7 has more OH- activity than H+, and is considered basic. Changes in pH can change the aspects of water chemistry.

E. coli in freshwater and *Enterococci* in saltwater are indicator bacteria that are not usually disease-causing agents themselves. However, high concentrations suggest the presence of disease-causing organisms. *E. coli* and Enterococci bacteria sample results indicate the probability of finding pathogenic organisms in a stream or reservoir.

Chlorophyll is the photosynthetic, green pigment found in most plants, algae, and cyanobacteria. The concentration of chlorophyll a is used to estimate phytoplankton biomass in surface water. In aquatic environments, excessive growth of aquatic vegetation or phytoplankton (e.g. algal blooms) disrupts normal functioning of the ecosystem, causing a variety of problems such a reduction of dissolved oxygen in water.

Sampling Parameter List

The following section groups the Clean Rivers Program sampling parameters by type . The three types are field, conventional, and bacteria. They are not all inclusive and may vary by sample site or monitoring agency.

Monitoring Programs and Summary of Water Quality

Field Parameters

- Dissolved oxygen—mg/L and % saturation
- Temperature
- Specific conductance
- pH
- Salinity (tidal waters only)
- Secchi-disk transparency
- Days since last precipitation (significant enough to influence water quality)
- Flow severity (freshwater streams and rivers)
- Stream discharge (freshwater streams and rivers)
- Method of stream discharge measurement (freshwater streams and rivers)

Conventional Parameters

- Total Alkalinity
- Sulfate (SO4)
- Chloride
- Total Hardness
- Total Suspended Solids (T.S.S.)
- Turbidity (NTU)
- Ammonia (NH3)
- Nitrate + Nitrite (NO3+NO2)
- Total Phosphorus (PO4)

Bacteria

- E. *coli* (freshwater streams and rivers)
- Enterococcus (tidal waters only)

Basin-Wide Monitoring Program

LNVA's basin-wide monitoring program included 25 routine stations in the Neches River Basin in FY 2018. Five of these sites are located in the upper portion of the Neches Basin on Lake Sam Rayburn. This report will only focus on the stations located in the Lower Neches and Neches Trinity Coastal Basin. The CRP website at https://cms.lcra.org provides detailed information about each station on the Coordinated Monitoring Schedule (CMS) including maps showing locations for each station. Maps for the stream segments and their sampling information can be found starting on page 15 of this report. The chart under the map lists a site description, a station ID, a water body ID that lists what segment the station is in and what agency is performing the sampling. The frequency a year that the sampling agency is collecting field, conventional, and bacteria samples is also listed. FY 2018 is unique for LNVA due to Hurricane Harvey interfering with the first quarter sampling. LNVA typically samples four times a year at each station but FY 2018 will only have three sampling events representing the second, third and fourth quarters.

TCEQ Region 10 in Beaumont is monitoring 19 stations in the Lower Neches River and Neches-Trinity Coastal Basins. No CMS changes were made by LNVA or TCEQ for FY 2017 or FY 2018. Descriptions of each stream segment in the Lower Neches and Neches-Trinity Coastal Basins as well as any special studies that have taken place within the segment are listed below and go through page 13 of this report.

Segment 0601: Neches River Tidal

The Neches River Tidal (0601) is defined in the Texas Surface Water Quality Standards (TSWQS) as a river segment from the confluence with Sabine Lake in Orange County to the Neches River Saltwater Barrier, which is at a point 0.8 kilometers (0.5 miles) downstream of the confluence of Pine Island Bayou, [a point 11.3 kilometers (7.0 miles) upstream of IH 10] in Orange County. Below the I-10 crossing in Beaumont, the segment is highly industrialized, consisting primarily of a navigation channel from the mouth of the river to the Port of Beaumont, which is maintained by the U.S. Army Corps of Engineers (USACE). This navigation channel is dredged 40 feet deep and 400 feet wide in order to accommodate marine traffic and large vessels. A proposed USACE project would deepen this channel from 40 feet to 48 feet to accommodate larger ships that will be traveling through the Panama Canal, allowing them to reach local ports and critical industry along the waterway.

Segment 0601 is classified as a tidal stream segment with intermediate aquatic life use and primary contact recreation use designations. Located on the most southerly end of the Neches River, hydrologic influences on this segment include tidal exchange and freshwater inflows. This segment is where Level IV Ecoregions Northern Humid Gulf Coastal Prairies (34a) and Texas-Louisiana Coastal Marshes

Summary of Water Quality

(34g) converge. The area has sandy, silt, and clayey substrates, and consists of low, flat plains with some of the area being tidal marshes with bayous. Land use is primarily oil and gas production, along with marshland, wildlife and waterfowl habitat, cropland, and urban/industrial. Cities located along Segment 0601 include Beaumont, Port Neches, and Groves.

The segment boundary is 27 miles long with an unclassified water body within this segment called Star Lake Canal which is three miles in length. Star Lake Canal (0601A) is a tidally influenced, dredged canal that receives industrial effluents, which discharge into the Neches River. The canal was constructed after 1948 as an industrial wastewater and storm water outfall, and is currently used by local industries and manufacturing facilities. The primary flow in Star Lake Canal is due to tidal fluctuations and industrial discharges (wastewater/stormwater outfalls) into the canal.

TCEQ Region 10 currently monitors five stations and LNVA monitors one station on this tidal segment. Historical water quality concerns and impairments include elevated bacteria, nutrients, depressed dissolved oxygen and organics in water (malathion).

Neches River near Lakeview

Segment 0602: Neches River below B.A. Steinhagen Reservoir

The Neches River below B.A. Steinhagen Reservoir (0602) is defined in the TSWQS as a river segment from the Neches River Saltwater Barrier, which is at a point 0.8 kilometers (0.5 miles) downstream of the confluence of Pine Island Bayou, [a point 11.3 kilometers (7.0 miles) upstream of IH 10] in Orange County to Town Bluff Dam in Jasper/Tyler County. Situated in a broad flood plain, the segment is 84 miles long and major tributaries include Village Creek and Pine Island Bayou. Stream discharge is regulated by the Town Bluff Dam at B.A. Steinhagen Lake and the Neches River Saltwater Barrier.

Segment 0602 is situated in the Level III Ecoregion known as South Central Plains, also termed the "piney woods". Soils are sandy loams, acidic sands, and some silty substrates, with poorly drained soils in the floodplains, flatwoods, and low terraces. Land use includes livestock agriculture, hunting leases, timber production, pasture production, recreation, wildlife habitat, oil and gas production, and some public land (Big Thicket National Preserve). Land cover includes mixed forest, evergreen forest, deciduous forest, pine plantations, and forested wetlands.

Segment 0602 is designated for high aquatic life use, primary contact recreation use, and public water supply. Two routine SWQM stations are monitored quarterly by LNVA and one station is monitored by TCEQ Region 10.

The Texas Department of State Health Services (DSHS) has issued several fish consumption advisories for portions of this segment on the Neches River. The advisories warn the public to limit their consumption of six species of fish due to elevated levels of mercury in fish tissue samples collected. The latest advisory (ADV-51) also includes dioxins and adds blue catfish, flathead catfish, gar, smallmouth buffalo, and spotted bass. The advisory area includes the Neches River and all contiguous waters from the SH 7 bridge west of Lufkin downstream to the U.S. Hwy. 96 bridge near Evadale which is located in Segment 0602. Additional Information on the fish consumption advisories can be found on the DSHS website at: https://www.dshs.texas.gov/seafood/advisories-bans.aspx.

Segment 0603: B.A. Steinhagen Lake

B.A. Steinhagen is a reservoir managed by the U.S. Army Corps of Engineers (USACE) and covers approximately 13,000 surface acres. It is situated in the piney woods area located along U.S. Hwy. 190 between Woodville and Jasper where it impounds the Neches River near the confluence with the Angelina River.

Along with Sam Rayburn Reservoir, it provides flood control for the lower Neches River Basin and generates

Summary of Water Quality

hydroelectric power at the USACE Town Bluff Dam or "Dam B" which supplies freshwater downstream to LNVA and other users along the Neches River.

Soils in the segment are acidic and sandy which supports upland longleaf pine woodlands, longleaf pine savannas, and hardwood slope forests. Segment 0603 is largely represented by Level IV Ecoregion 35e called Southern Tertiary Uplands, which is more hilly than the Flatwoods to the south. Land use is primarily for timber production, public lands, pasture and livestock production, recreation and wildlife habitat. The land is covered by mixed forest, evergreen forest, deciduous forest, and pine plantations.

Tributaries in the segment include Wolf Creek and Sandy Creek. Wolf Creek drains areas of pine forest and pastureland, while Sandy Creek is a forested sub-watershed with pasturelands and its upper reaches drain the City of Jasper. Sandy Creek and Wolf Creek historically have elevated bacteria levels.

Three stations are monitored in the segment by TCEQ Region 10 and LNVA including routine water quality monitoring on Sandy Creek and Wolf Creek.

The Texas DSHS issued a fish consumption advisory in Nov. 1995 after elevated levels of mercury were found in largemouth bass, freshwater drum, white bass and hybrid striped bass. The new advisory (ADV-51) rescinds the 1995 advisory (ADV-12) for B.A. Steinhagen and Sam Rayburn Reservoirs. This new advisory includes both mercury and dioxins, and the list of species adds blue catfish, flathead catfish, gar, smallmouth buffalo and spotted bass to those included in ADV-12 for Sam Rayburn and B.A. Steinhagen Reservoirs.

The issue of mercury in fish tissue is regional, encompassing other water bodies in East Texas in addition to the B.A. Steinhagen and Sam Rayburn Reservoirs. The level of mercury contamination in fish tissue is the result of bioaccumulation, and there are no risks to the public in other recreational activities.

Segment 0607: Pine Island Bayou

Pine Island Bayou is defined in the TSWQS as from the confluence with the Neches River in Hardin/Jefferson County to FM 787 in Hardin County and is 81 miles in length. Major tributaries include Little Pine Island Bayou (0607B) and Willow Creek (0607C).

Pine Island Bayou has a large drainage area of 657 square miles. The segment is a natural streambed with sand and clay substrate from its headwaters to its confluence with the Neches River. Streams are low gradient and sluggish in this segment with sandy, silty substrates. Land use is timber production, pastureland, cattle production, and oil and gas production.

Soils are acidic and drain poorly after high rainfall events. The Level IV ecoregion is Flatwoods (35f), and physiography consists of flat plains, irregular plains, small, undrained depressions, and a few surface mounds from salt domes.

Six routine stations are monitored by LNVA on a quarterly basis and one station is monitored by TCEQ Region 10 on Boggy Creek near Lumberton.

In June 2008, TCEQ installed a Continuous Water Quality Monitoing Network (CWQMN) station on Pine Island Bayou near the Hwy. 69 bridge at LNVA's BI canal pump station. LNVA proposed the real-time monitoring station in 2006 to address water quality concerns in Pine Island Bayou. LNVA operates and maintains the station (CAMS 749) which uses YSI instruments equipped with multiple probes including optical DO and Turbidity. The station collects and transmits real-time data for the following parameters: dissolved oxygen, pH, water temperature, conductivity, TDS, turbidity, and water depth. Pine Island Bayou CWQMN Station (CAMS 749) displays real-time water quality data online at the following address: https://www.tceq.texas.gov/cgi-bin/compliance/monops/water_daily_summary.pl?cams=749.

Low DO levels in the watershed are likely due to natural causes which are influenced by high ambient summer temperatures, low-flow conditions, and decaying organic material that is present in the water.

Special Projects:

Pine Island Bayou Use Attainability Analysis (UAA) Project, 9/20/2005–10/1/2011; TCEQ sampling included 24hr DO, Habitat, Benthics, Nekton, Conventionals, Flow, and Field Parameters.

(0607B), 9/20/2005–10/1/2011; TCEQ sampling included 24hr DO, Habitat, Benthics, Nekton, Conventionals, Flow, and Field Parameters

Special Projects:

Willow Creek, Cypress Creek, and Boggy Creek Use Attainability Analysis (UAA), 6/1/2007–10/15/2010; TCEQ performed limited sampling (24hr DO) and used the Pine Island Bayou UAA.

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Segment 0608: Village Creek

The Village Creek classified stream segment is from the confluence with the Neches River in Hardin County to the confluence of Lake Kimball Dam in Hardin County. This segment is broad and covers over 200 miles in stream length. The Village Creek watershed has many tributaries draining approximately 1,113 square miles as it flows southeasterly to its confluence with the Neches River. Segment 0608 includes the following tributaries or unclassified segments: Beech Creek (0608A), Big Sandy Creek (0608B), Cypress Creek (0608C), Mill Creek (0608E), Turkey Creek (0608F), and Lake Kimball (0608G).

The Village Creek watershed lies entirely within the region of southeast Texas known as the Big Thicket. Segment 0608 is similar to Segment 0602 and 0603, in that it falls under the same South Central Plains, or "Piney Woods" ecoregion. Once thickly blanketed in pine and hardwood forests, now most of the area is covered by loblolly and shortleaf pine plantations. Village Creek State Park is located in Hardin County and covers more than 1,000 acres of thick forests. Land use is timber production, oil and gas extraction, pastureland, cattle production, recreational areas and public lands.

In this segment, LNVA monitors eight routine SWQM stations quarterly and TCEQ Region 10 monitors one station on Village Creek.

Historical data assessments found a correlation between water quality concerns and stream flows in the segment. Low dissolved oxygen concentrations correlated with low stream flows during the summer months while low pH levels during increased stream flows indicated the presence of tannins and acidic soils.

In 2009, the Texas DSHS issued a fish consumption advisory (ADV-39) for Village Creek. The advisory warns the public to limit their consumption due to elevated levels of mercury in fish tissue samples taken from three species. The DSHS advises that adults should limit consumption of crappie, gar, and largemouth bass to no more than two 8oz meals per month and children under twelve years old should limit consumption of crappie, gar, and largemouth bass to no more than two 4oz meals per month. Women who are nursing, pregnant, or who may become pregnant should not consume crappie, gar, and largemouth bass from Village Creek.

In 1999, a DSHS fish consumption advisory (ADV-16) was issued for Lake Kimball (0608G) due to high levels of mercury in fish tissue for all species of fish. Adults should limit their consumption of fish to no more than two 8oz meals per month. Children under twelve years old should limit consumption to no more than two 4oz meals per month.

Special Projects:

Willow Creek, Cypress Creek, and Boggy Creek Use Attainability Analysis (UAA), 6/1/2007–10/15/2010; TCEQ performed limited sampling (24hr DO) and used the Pine Island Bayou UAA.

Segment 0609: Angelina River below Sam Rayburn Reservoir

The Angelina River below Sam Rayburn Reservoir is defined in the TSWQS as from a point immediately upstream of its confluence with Indian Creek to the Sam Rayburn Reservoir Dam in Jasper County. The Angelina River ranges from 75-150 feet in width through this segment as it meanders through the rolling hills of the East Texas Piney Woods (Level III Ecoregion 35).

The segment extends 13 river miles from the tailrace below Sam Rayburn Dam towards the headwaters of B.A. Steinhagen Reservoir. Another 5.2 miles of old riverbed exists along the lower side of Sam Rayburn Dam upstream from the confluence with the tailrace. The drainage area of Segment 0609 is 107 square miles, with land use characterized as sparsely populated and heavily forested with minimal area of non-irrigated cropland located in the southeast quadrant of the watershed.

The 153,000 acre Angelina National Forest borders the upper part of Segment 0609, and the land use includes

Angelina River @Hwy 63

Summary of Water Quality

recreational activities on public lands in the area. Flows are generally very high compared to other segments in the basin, especially during the almost daily water releases from the Sam Rayburn Dam. Fishing, boating, swimming and water skiing are very common in this segment. Segment 0609 is designated for primary contact recreation use, high aquatic life use, and public water supply.

LNVA monitors one SWQM station in this segment.

Segment 0701: Taylor Bayou above Tidal

Taylor Bayou above Tidal, Segment 0701, is from the salt water lock 7.7 kilometers (4.8 miles) downstream of SH 73 in Jefferson County to the confluence with Hillebrandt Bayou, and includes Shallow Prong Lake on Big Hill Bayou. Taylor Bayou is 34 feet long, ranges from 8 to 13 feet in depth, and is characterized as low gradient with sluggish flow. Shallow Prong Lake (0701D) is a small reservoir that is 150 surface acres.

Segment 0701 is located in the Level III ecoregion known as the Western Gulf Coastal Plain (ecoregion 34) and has a mix of two Level IV ecoregions present: the Northern Humid Gulf Coastal Prairies (34a) and the Texas-Louisiana Coastal Marshes (34g). Soils drain poorly and much of the segment stays wet for most of the year. Soils are fine textured and made up of sands, silts, and clays, and even some salt domes.

Segment 0701 is generally flat plains with most of the area covered by standing water, and tidal marshes with bayous, lakes, and canals. Land use is largely agricultural with farming of rice, grain, sorghum, cotton, and soybeans common. There is also cattle production, pastureland, urban and industrial uses, oil and gas production, waterfowl hunting, marshland, and wildlife habitat throughout Segment 0701.

The segment is designated for primary contact recreation use and intermediate aquatic life use. Irrigation return flows from rice fields, storm water runoff and municipal and industrial discharges are the principle sources of flow in the segment and its major tributary, Hillebrandt Bayou. A saltwater lock near the mouth of the bayou minimizes tidal impact and saltwater intrusion, but the segment is still highly tidally influenced.

TCEQ Region 10 monitors two SWQM stations on Taylor Bayou and one station on Shallow Prong Lake.

Special Projects:

Taylor Bayou Above Tidal & Hillebrandt Bayou Aquatic Life Use-Attainability Analyses (UAAs), 4/1/2009–3/31/2010; Texas Institute for Applied Environmental Research (TIAER) sampling included 24hr DO, Benthics, Nekton, and Flow

Segment 0702: Intracoastal Waterway Tidal

The Intracoastal Waterway Tidal, Segment 0702, is from the confluence with Galveston Bay at Port Bolivar in Galveston County to the confluence with the Sabine-Neches/Port Arthur Canal in Jefferson County (including Taylor Bayou Tidal from the confluence with the Intracoastal Waterway up to the saltwater lock 7.7 kilometers (4.8 miles) downstream of SH 73 in Jefferson County). This tidal segment is 63 miles long and includes the unclassified segment, Alligator Bayou (0702A). Segment 0702 is primarily located in the Level IV Ecoregion known as Texas-Louisiana Coastal Marshes (34g). This ecoregion is 539 square miles, and is comprised of flat plains with most of the land covered in standing water, beach ridges, cheniers, canals, and tidal marshes with bayous meandering through. Elevation is anywhere from sea level to 30 feet, and soil is made up of clay and silt with some shell fragments and sand on cheniers/beach ridges. The highest point in the segment is at High Island (30 feet) which is situated atop an old salt dome. This ecoregion has many freshwater and saltwater coastal marshes, and a wetter, more humid climate than Ecoregion 35 to the northeast.

Land use includes marshland, wildlife and waterfowl habitat, oil and gas production, and extensive industrial activity. The marshes in this segment provide wintering grounds for ducks and geese and breeding and rearing grounds for fish and shrimp such as brown shrimp, white shrimp, blue crab, red drum, southern flounder, and spotted sea trout. Due to the ecologically rich areas in Segment 0702, fishing is both recreationally popular as well as commercially important.

Two SWQM stations in this segment are routinely monitored by TCEQ Region 10 in Beaumont .

Segment 0702 is designated for primary contact recreation use and high aquatic life use. Historically, Segment 0702 has been listed on the state's 303(d) List for bacteria impairments, ambient toxicity in water, toxicity in sediment, and impaired fish community.

Summary of Water Quality

Alligator Bayou is a freshwater tributary of Taylor Bayou Tidal, with a watershed of approximately 40 square miles located upstream from the saltwater locks on Taylor Bayou. Discharges to the waterbody are primarily from municipal and industrial facilities, with a small amount from agriculture. An interim assessment of the presence and causes of ambient water and sediment toxicity in Alligator Bayou, Segment 0702A, was conducted by the TMDL program in 2001—2002.

In June 2013, the Texas DSHS issued a revised fish consumption advisory (ADV-50) for Galveston Bay. The DSHS has removed the consumption advisory for spotted seatrout from a portion of Galveston and Trinity Bays and all of East and West Bays. Laboratory testing of spotted seatrout from these areas indicated that concentrations of dioxins and PCBs have decreased to acceptable levels and no longer pose a significant health risk.

An advisory for all species of catfish remains in effect for all of the Galveston Bay System due to dioxins and PCBs. This advisory includes a portion of the Intracoastal Waterway Tidal from the eastern most boundary of East Bay to Port Bolivar in Segment 0702.

Special Projects:

Galveston Bay System Dioxin & PCBs Survey, 9/1/2009-4/2/2014; TCEQ survey to characterize the extent of dioxin and PBC contamination in the Galveston Bay system which includes Segment 0702.

Segment 0703: Sabine-Neches Canal Tidal

The Sabine-Neches Canal Tidal, Segment 0703, is from the confluence with Sabine Pass at the southern tip of Pleasure Island in Jefferson County to the Sabine Lake seawall at the northern tip of Pleasure Island in Jefferson County. This tidal segment is 16 miles in length. The Sabine-Neches Canal exchanges water with Sabine Lake, and a large amount of marine traffic navigates between the Port of Houston and Port Arthur, including both large vessels and smaller recreational boats.

Land use includes oil and gas production, as well as marshland, wildlife, and waterfowl habitat. The ecoregion encompassing Segment 0703 is Western Gulf Coastal Plain (34), and more specifically Ecoregion IV known as Texas Louisiana Coastal Marshes (34g). There are extensive freshwater and saltwater coastal marshes consisting of grasses, sedges, and rushes. Few trees are found in this segment, and soils consist of clay and silt, with sand and shell fragments on cheniers or beach ridges. Most of the area is covered by standing water as bayous, lakes, or canals in low lying areas.

Two SWQM stations are routinely monitored by TCEQ Region 10 in Beaumont.

Segment 0704: Hillebrandt Bayou

Hillebrandt Bayou, Segment 0704, is defined as a freshwater stream from the confluence of Taylor Bayou in Jefferson County to a point 100 meters (110 yards) upstream of SH 124 in Jefferson County. Hillebrandt Bayou is 14 miles in length, and extends from the southern part of the South Central Plains Ecoregion (35) to the Northern Humid Gulf Coastal Prairies Ecoregion (34a). Segment 0704 tributaries or unclassified segments include Willow Marsh Bayou (0704A), Kidd Gully (0704B), Pevitot Gully (0704C), and Bayou Din (0704D).

Soils consist of fine-textured sands, silt, and clayey substrates, and low gradient rivers, streams, and bayous are common. Drainage near Hillebrandt Bayou is generally poor due to the substrate types, and soils remain wet most of the year. Land use is pastureland, cropland, urban and industrial, oil and gas production, waterfowl hunting, and golf course use.

Hillebrandt Bayou serves as the primary receiving stream for the storm water drainage system in the City of Beaumont. A wastewater discharge includes effluent which is treated in the final stages by manmade and natural wetlands south of Beaumont along Hillebrandt Bayou. These wetlands comprise over 900 acres. Willow Marsh Bayou, Kidd Gully and Pevitot Gully convey additional flows from agricultural land, and Bayou Din is located along a public golf course. In addition, flows in Hillebrandt Bayou are regulated by saltwater gates and barge locks on Taylor Bayou in Port Arthur.

Segment 0704 is designated for primary contact recreation use and intermediate aquatic life use. Three SWQM stations are routinely monitored by TCEQ Region 10 in Beaumont.

Special Projects:

Taylor Bayou Above Tidal & Hillebrandt Bayou Aquatic Life Use-Attainability Analyses (UAAs), 4/1/2009–3/31/2010; Texas Institute for Applied Environmental Research (TIAER) sampling included 24hr DO, Benthics, Nekton, and Flow

Clean Rivers Program Nutrient Monitoring Project,

The Texas Integrated Report and Impairments by Segment

10/25/2011– 8/31/2013; CWA Section 106 Grant allowed CRP to supplement the collection of additional nutrient parameters in select basins. LNVA collected total kjeldahl nitrogen (TKN) and chlorophyll-a at 25 routine stations in Basins 6 and 7.

The Louisiana Iris grows in various places on Hillebrandt Bayou during the Spring.

The Texas Integrated Report of Surface Water Quality

The Texas Integrated Report of Surface Water Quality describes the status of the state's waters, as required by Sections 305(b) and 303(d) of the federal Clean Water Act. It summarizes the condition of the state's surface waters, including concerns for public health, quality for support of aquatic species and other wildlife, and specific pollutants and their possible sources. The Integrated Report consists of the Texas Water Quality Inventory and 303(d) List of impaired water bodies based on historical water quality data.

State water quality assessment reports are completed generally every two years, in even numbered years, and must be approved by the EPA. The most current approved version is the 2014 report pending the upcoming adoption of the 2016 version of the Texas Integrated Report. TCEQ includes data collected during the most recent seven-year period; however, if needed, up to ten years of data are included to attain a minimum number of samples for assessment.

The 2014 Texas 303(d) List was adopted and approved for submission by the TCEQ on June 3, 2015. It was submitted to the Environmental Protection Agency (EPA) and approved on Nov. 19, 2015. Water bodies included on the 2014 303(d) List are not meeting current water quality standards and therefore do not support their designated uses. Water bodies may also have concerns for use attainment and established screening levels which is part of the Texas Integrated Report. Additional information including the approved 2014 Texas 303(d) List is available at: https://www.tceq.texas.gov/waterquality/assessment/14twqi/14txir.

Impairments by Stream Segment

The following is a list of impairments by segment from 303(d) list of the 2014 Texas Integrated Report :

Segment 0601: Neches River Tidal

- Not supporting contact recreation use due to bacteria in the Neches River Tidal (Enterococcus)
- Not supporting fish consumption use due to polychlorinated biphenyls (PCBs) in edible tissue
- Concern for aquatic life use due to malathion (lower segment only)

Segment 0601A: Star Lake Canal

- Not supporting contact recreation use due to bacteria (Enterococcus)
- Concern for aquatic life use due to malathion

Segment 0602: Neches River below B.A. Steinhagen

- Not supporting fish consumption use due to mercury and dioxins in edible tissue
- Concern for depressed dissolved oxygen
- Concern for mercury in edible tissue

Segment 0603: B.A. Steinhagen Lake

- Not supporting fish consumption use due to mercury and dioxins in edible tissue

Segment 0603A: Sandy Creek

- Not supporting contact recreation use due to bacteria

Segment 0603B: Wolf Creek

- Not supporting contact recreation use due to bacteria

Segment 0607: Pine Island Bayou

- Not supporting aquatic life use due to depressed dissolved oxygen
- Not supporting contact recreation use due to bacteria
- Concern for depressed dissolved oxygen

Texas Integrated Report and List of Impairments by Segment

Segment 0607A: Boggy Creek

- Not supporting aquatic life use due to depressed dissolved oxygen
- Concern for impaired habitat in Boggy Creek
- Concern for depressed dissolved oxygen (screening level)

Segment 0607B: Little Pine Island Bayou

- Not supporting aquatic life use due to depressed dissolved oxygen
- Concern for depressed dissolved oxygen (screening level)

Segment 0607C: Willow Creek

- Not supporting aquatic life use due to depressed dissolved oxygen
- Concern for depressed dissolved oxygen (screening level)

Segment 0608: Village Creek

- Not supporting fish consumption use due to mercury in edible tissue
- Concern for mercury in edible tissue
- Concern for low pH levels

Segment 0608A: Beech Creek

- Not supporting aquatic life use due to elevated copper
- Concern for impaired habitat

Segment 0608B: Big Sandy Creek

- Not supporting contact recreation use due to bacteria

Segment 0608C: Cypress Creek

- Not supporting aquatic life use due to depressed dissolved oxygen
- Concern for impaired habitat

Segment 0608E: Mill Creek

- Not supporting aquatic life use due to depressed dissolved oxygen

Segment 0608F: Turkey Creek

- Not supporting contact recreation use due to bacteria

Segment 0608G: Lake Kimball

- Not supporting fish consumption use due to mercury in edible tissue

Segment 0609: Angelina River below Sam Rayburn Reservoir

- Not supporting fish consumption use due to mercury and dioxins in edible tissue

Segment 0701: Taylor Bayou above Tidal

- Not supporting aquatic life use due to depressed dissolved oxygen
- Concern for depressed dissolved oxygen (screening level)
- Concern for chlorophyll-a

Segment 0701D: Shallow Prong Lake

- Concern for arsenic in edible tissue

Segment 0702: Intracoastal Waterway Tidal

- Not supporting contact recreation use due to bacteria
- Not supporting fish consumption use due to dioxins and PCBs in edible tissue
- Concern for chlorophyll-a in Taylor Bayou Tidal

Segment 0702A: Alligator Bayou

- Not supporting aquatic life use due to acute toxicity in water and sediment toxicity
- Concern for lead in sediment
- Concern for chlorophyll-a

Segment 0703: Sabine-Neches Canal Tidal

- Not supporting contact recreation use due to bacteria

Segment 0704: Hillebrandt Bayou

- Not supporting contact recreation use due to bacteria
- Not supporting aquatic life use due to depressed dissolved oxygen
- Concern for chlorophyll-a and ammonia-nitrogen
- Concern for depressed dissolved oxygen (screening level/DO minimum)

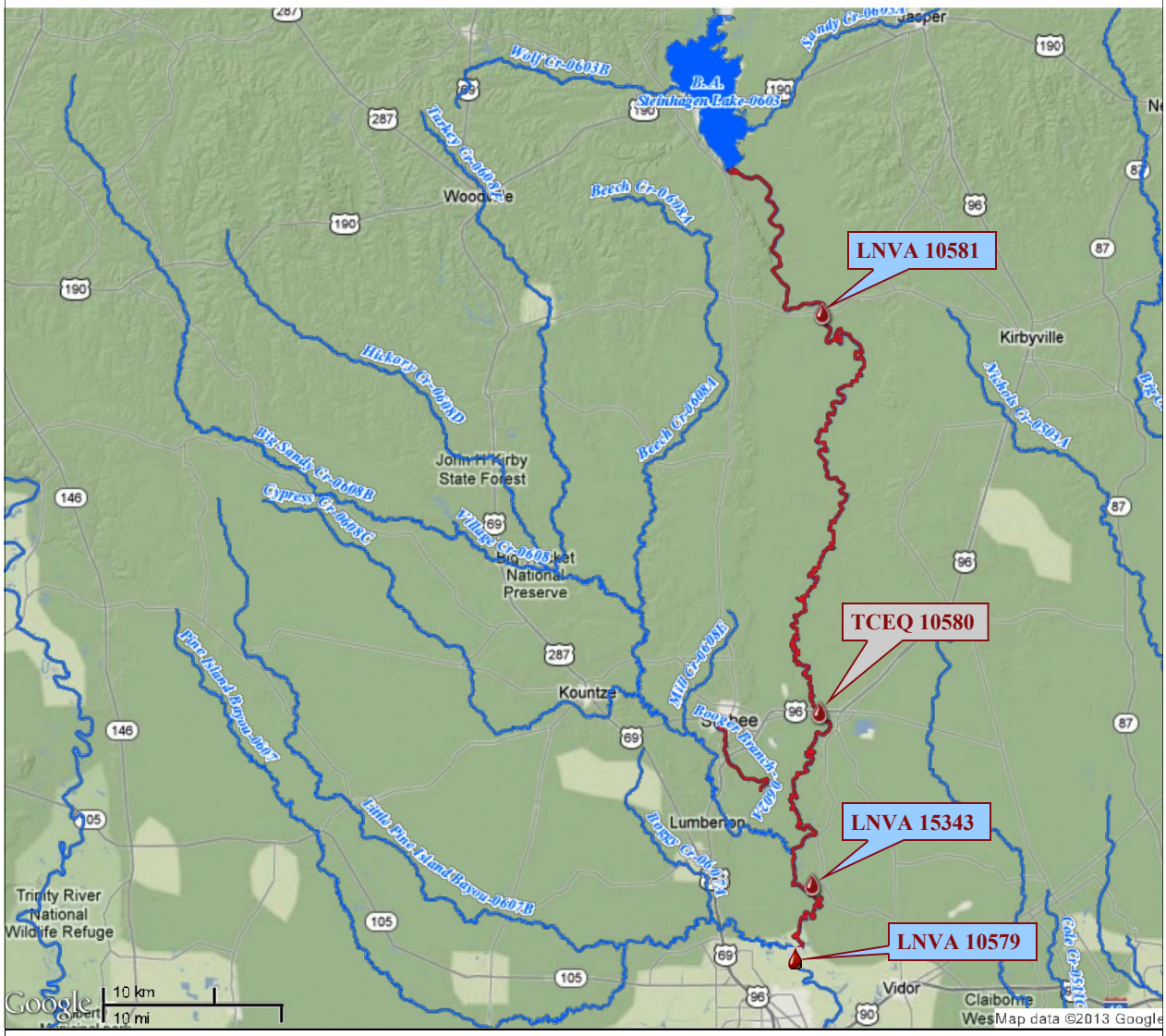
Water Quality Monitoring Stations

SEGMENT: 601 Neches River Tidal

Site Description	Station ID	Water-body ID	Basin	Agency	Field	Conv.	Bacteria	Flow	Metals in sediment
NECHES RIVER 0.8 KM DOWNSTREAM OF MOBIL CANAL 9.65 KM DOWNSTREAM OF IH 10 780 M UPSTREAM OF MANSFIELD FERRY ROAD	10570	0601	6	TCEQ	4	4	4		4
NECHES RIVER AT LNVA SALINITY STATION Y 1.8 KILOMETERS DOWNSTREAM OF NECHES RIVER SALTWATER	20774	0601	6	LNVA	4	4	4	4	
NECHES RIVER AT PORT NECHES CITY PARK BOAT RAMP 117 M NORTHEAST OF MERRIMAN STREET IN BEAUMONT	10566	0601	6	TCEQ	4	4	4		
NECHES RIVER AT SH 87 BRIDGE NORTH OF PORT	10563	0601	6	TCEQ	4	4	4		4
NECHES RIVER BRIDGE AT IH 10 NEAR BEAUMONT 1.02 KM EAST OF US 90/IH 10 INTERSECTION	10575	0601	6	TCEQ	4	4	4		4
STAR LAKE CANAL 0.4 KM UPSTREAM OF THE NECHES RIVER KM UPSTREAM OF SH 87/GULFWAY DRIVE NORTH OF PORT ARTHUR	10485	0601A	6	TCEQ	4	4	4		4

Water Quality Monitoring Stations

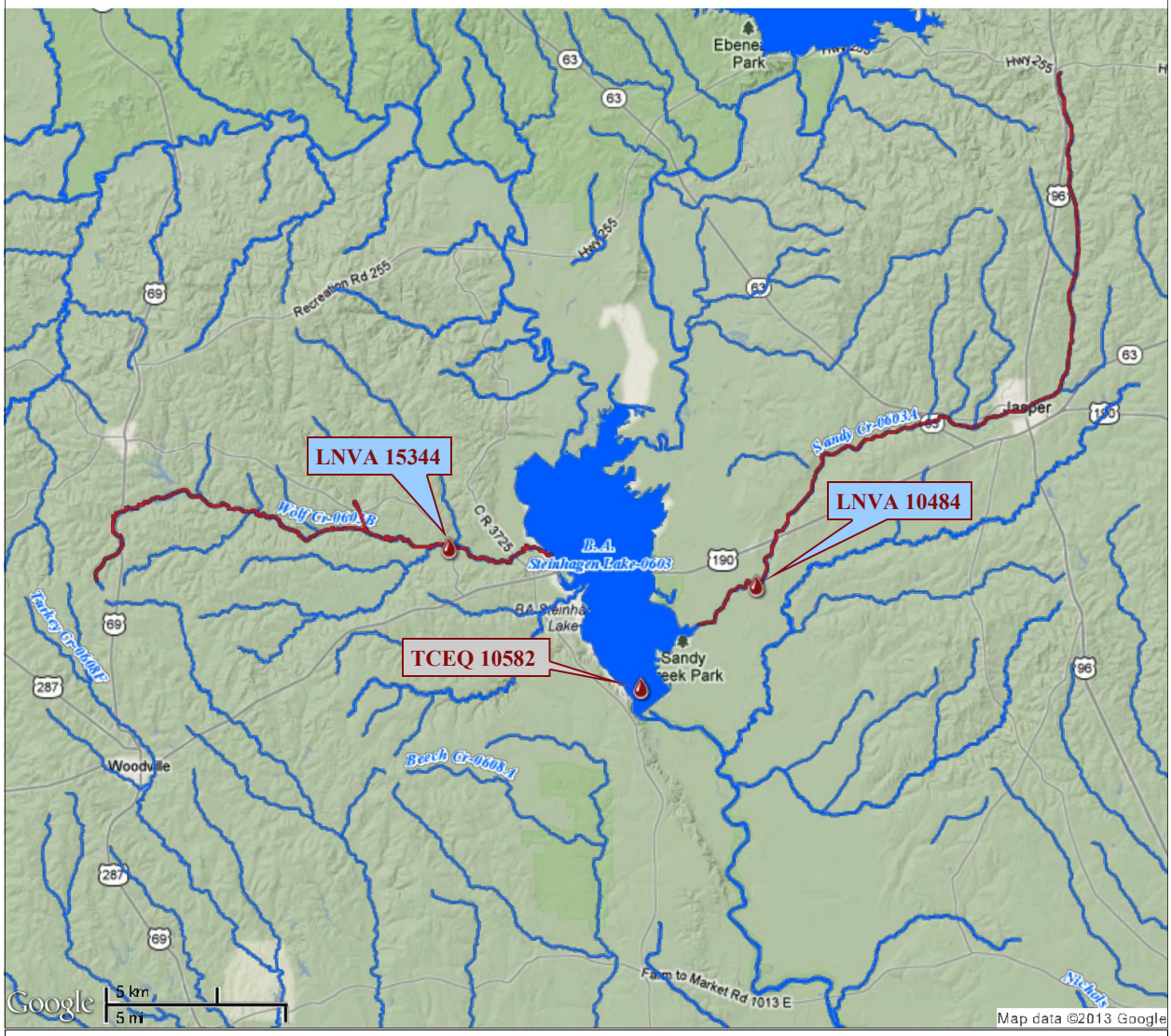
SEGMENT: 602 Neches River Below B. A. Steinhagen Lake



Site Description	Station ID	Water-body ID	Basin	Agency	Field	Conv.	Bacteria	Flow
NECHES RIVER AT US 96 2.09 KM WEST OF US 96/FM 105 INTERSECTION 8.6 KM EAST OF SILSBEE	10580	0602	6	TCEQ	4	4	4	4
NECHES RIVER AT FM 1013 IN THE BIG THICKET NATIONAL PRESERVE EAST OF SPURGER IN JASPER COUNTY	10581	0602	6	LNVA	4	4	4	4
NECHES RIVER NEAR LAKEVIEW 1 KM WEST OF FM 1131 12.24 KM UPSTREAM OF PINE ISLAND BAYOU CONFLUENCE	15343	0602	6	LNVA	4	4	4	4
NECHES RIVER AT HIGH LINE CROSSING 0.55 KM DOWNSTREAM OF PINE ISLAND BAYOU, 5.85 KM EAST NORTHEAST OF SH 105/US 69 INTERSECTION	10579	0602	6	LNVA	4	4	4	4

Water Quality Monitoring Stations

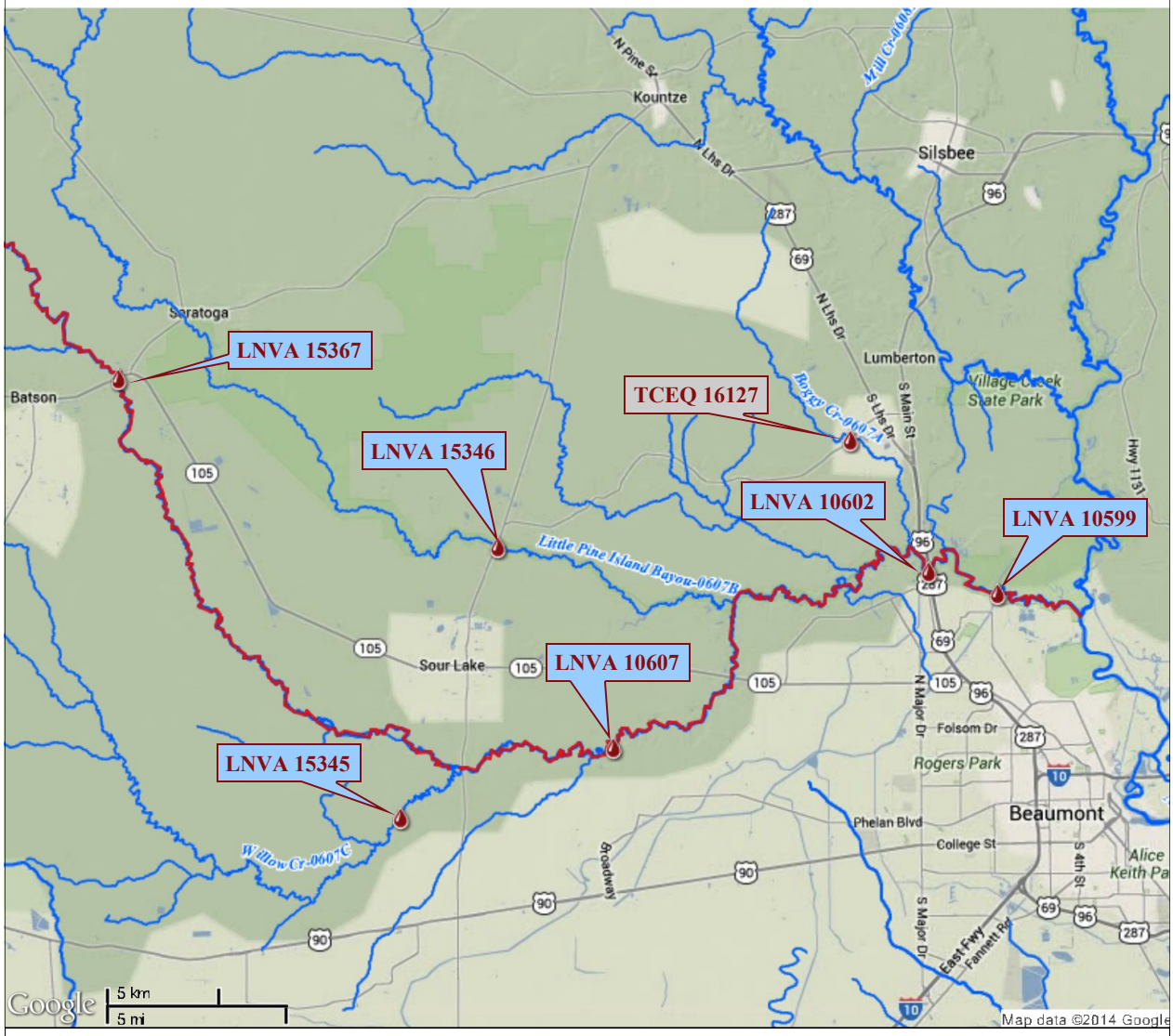
SEGMENT: 603 B. A. Steinhagen Lake



Site Description	Station ID	Water-body ID	Basin	Agency	Field	Conv.	Bacteria	Flow
B A. STEINHAGEN RESERVOIR NEAR DAM 948 M NORTHWEST OF DAM FACE 2.07 KM NORTH OF FM	10582	0603	6	TCEQ	4	4	4	
SANDY CREEK AT FM 777 2.15 KM SOUTHWEST OF FM 777/US 190 INTERSECTION 14.7 KM SOUTHWEST OF	10484	0603	6	LNVA	4	4	4	4
WOLF CREEK AT FM 256 5.6 KM UPSTREAM OF BA. STEINHAGEN RESERVOIR 2.3 KM NNW OF US 190/FM	15344	0603	6	LNVA	4	4	4	4

Water Quality Monitoring Stations

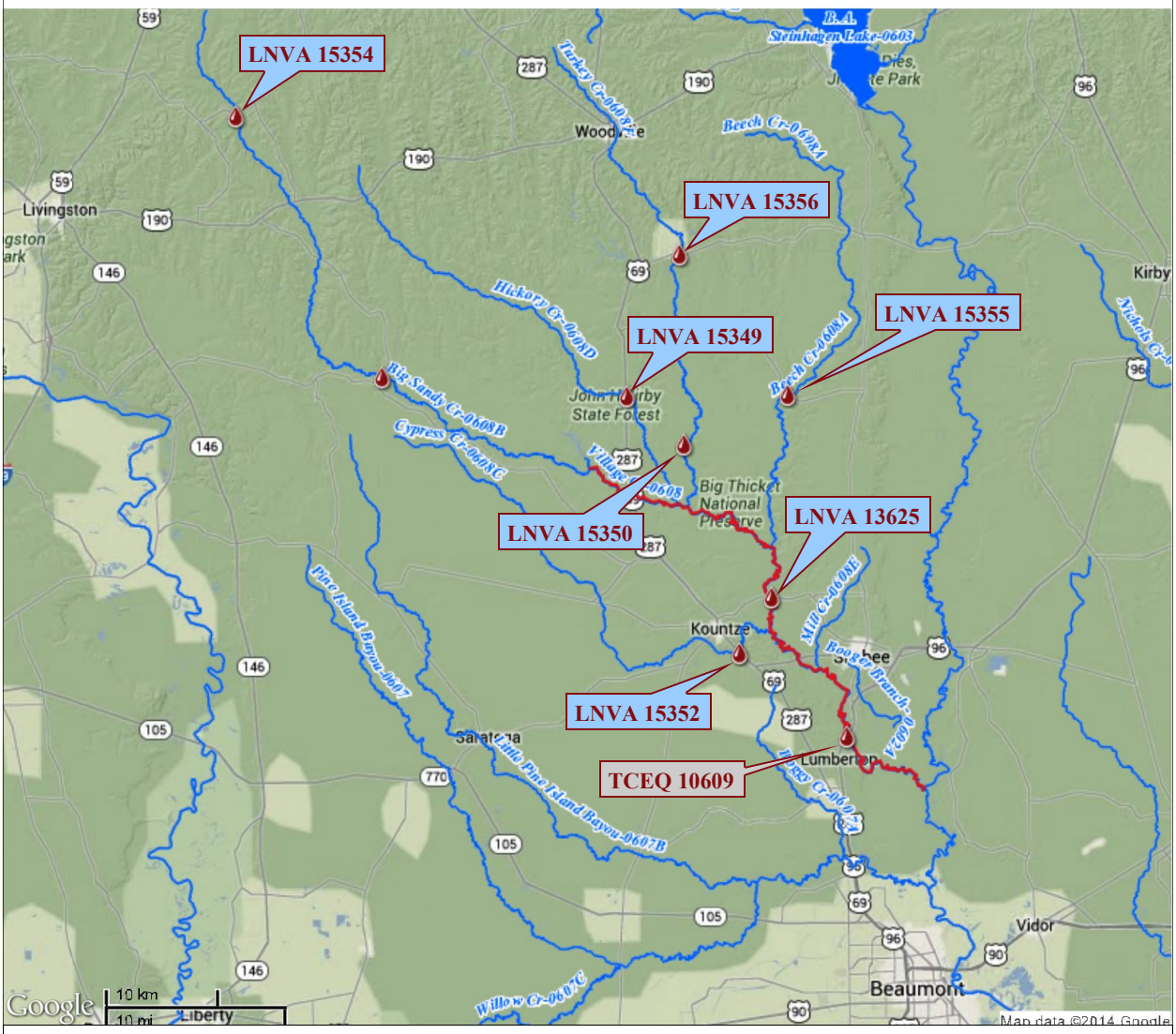
SEGMENT: 607 Pine Island Bayou



Site Description	Station ID	Water-body ID	Basin	Agency	Field	Conv.	Bacteria	Flow
PINE ISLAND BAYOU AT LNVA LOWER PUMP STATION, 6.62 KM UPSTREAM OF NECHES RIVER CONFLUENCE 2.86 KM EAST OF US 69	10599	0607	6	LNVA	4	4	4	4
PINE ISLAND BAYOU AT SH 105, 0.65 KM SOUTHWEST OF FM 770/SH 105 INTERSECTION NEAR CITY OF BATSON	15367	0607	6	LNVA	4	4	4	4
PINE ISLAND BAYOU AT SOUR LAKE ROAD, 7.5 KM SOUTHEAST OF INTERSECTION OF SH 326/SH 105 IN CITY OF SOUR LAKE	10607	0607	6	LNVA	4	4	4	4
PINE ISLAND BAYOU AT US 69 /US 96/US 287 AT VOTH	10602	0607	6	LNVA	4	4	4	4
BOGGY CREEK AT FM 421, 1.75 KM SOUTHWEST OF FM 421/US 69 INTERSECTION NEAR LUMBERTON	16127	0607A	6	TCEQ	4	4	4	4
LITTLE PINE ISLAND BAYOU AT SH 326, 5.68 KM NORTH OF CITY OF SOUR LAKE	15346	0607B	6	LNVA	4	4	4	4
WILLOW CREEK AT UNNAMED ROAD, 4.87 KM NORTH NORTH-WEST OF NOME 6.78 KM UPSTREAM OF PINE ISLAND BAYOU CONFLUENCE/SH 326	15345	0607C	6	LNVA	4	4	4	4

Water Quality Monitoring Stations

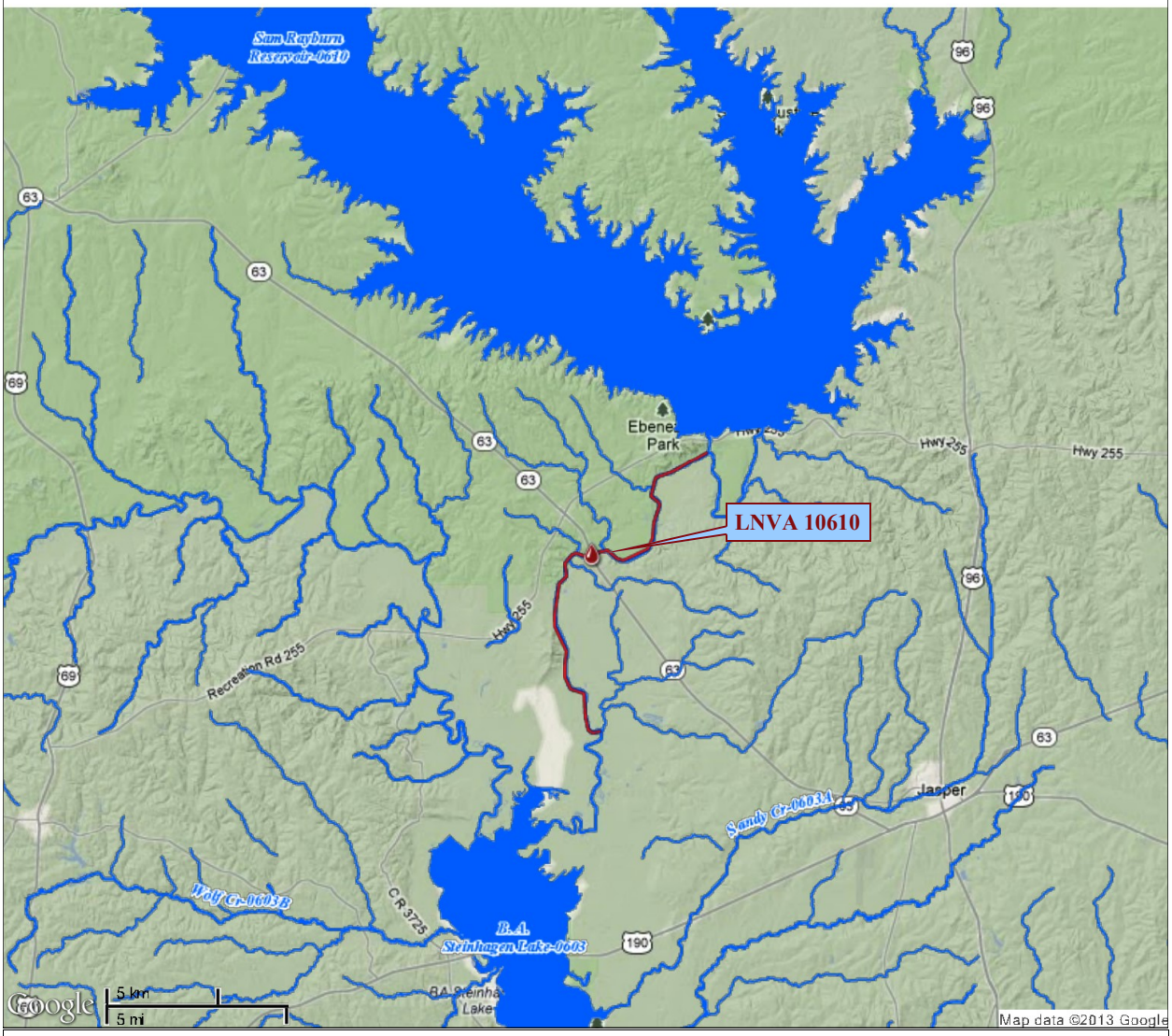
SEGMENT: 608 Village Creek



Site Description	Station ID	Water-body ID	Basin	Agency	Field	Conv.	Bacteria	Flow
VILLAGE CREEK AT US 96, 6.35 KM SOUTH OF SILSBEE	10609	0608	6	TCEQ	4	4	4	4
VILLAGE CREEK AT FM 418, 5.04 KM NORTHEAST OF KOUNTZE	13625	0608	6	LNVA	4	4	4	4
BEECH CREEK AT FM 1943, 7 KM WEST OF FM 1943/ FM 92 INTERSECTION 7.3 KM WEST-SOUTHWEST OF CITY OF FRED	15355	0608A	6	LNVA	4	4	4	4
BIG SANDY CREEK AT FM 942, 2.07 KM SOUTHWEST OF FM 942/FM 2500 INTERSECTION 10.47 KM SOUTHEAST OF LEGGETT	15354	0608B	6	LNVA	4	4	4	4
CYPRESS CREEK AT US 69/US 287, 3.4 KM SOUTHEAST OF KOUNTZE	15352	0608C	6	LNVA	4	4	4	4
HICKORY CREEK AT US 69, 0.73 KM NORTH OF FM 2827/US 69 INTERSECTION 5.8 KM SOUTH OF WARREN	15349	0608D	6	LNVA	4	4	4	4
TURKEY CREEK AT FM 1013, 3.57 KM EAST NORTHEAST OF US 287/FM 1013 INTERSECTION	15356	0608F	6	LNVA	4	4	4	4
TURKEY CREEK AT GORE STORE ROAD, 6.3 KM SOUTHEAST OF FM 2827/US 69 INTERSECTION	15350	0608F	6	LNVA	4	4	4	4

Water Quality Monitoring Stations

SEGMENT: 609 Angelina River Below Sam Rayburn Reservoir



Site Description	Station ID	Water-body ID	Basin	Agency	Field	Conv.	Bacteria	Flow
ANGELINA RIVER AT SH 63, 2.10 KM SOUTHEAST OF SH 63/REC RD 255 INTERSECTION 19.56 KM NORTH OF JASPER	10610	0609	6	LNVA	4	4	4	4

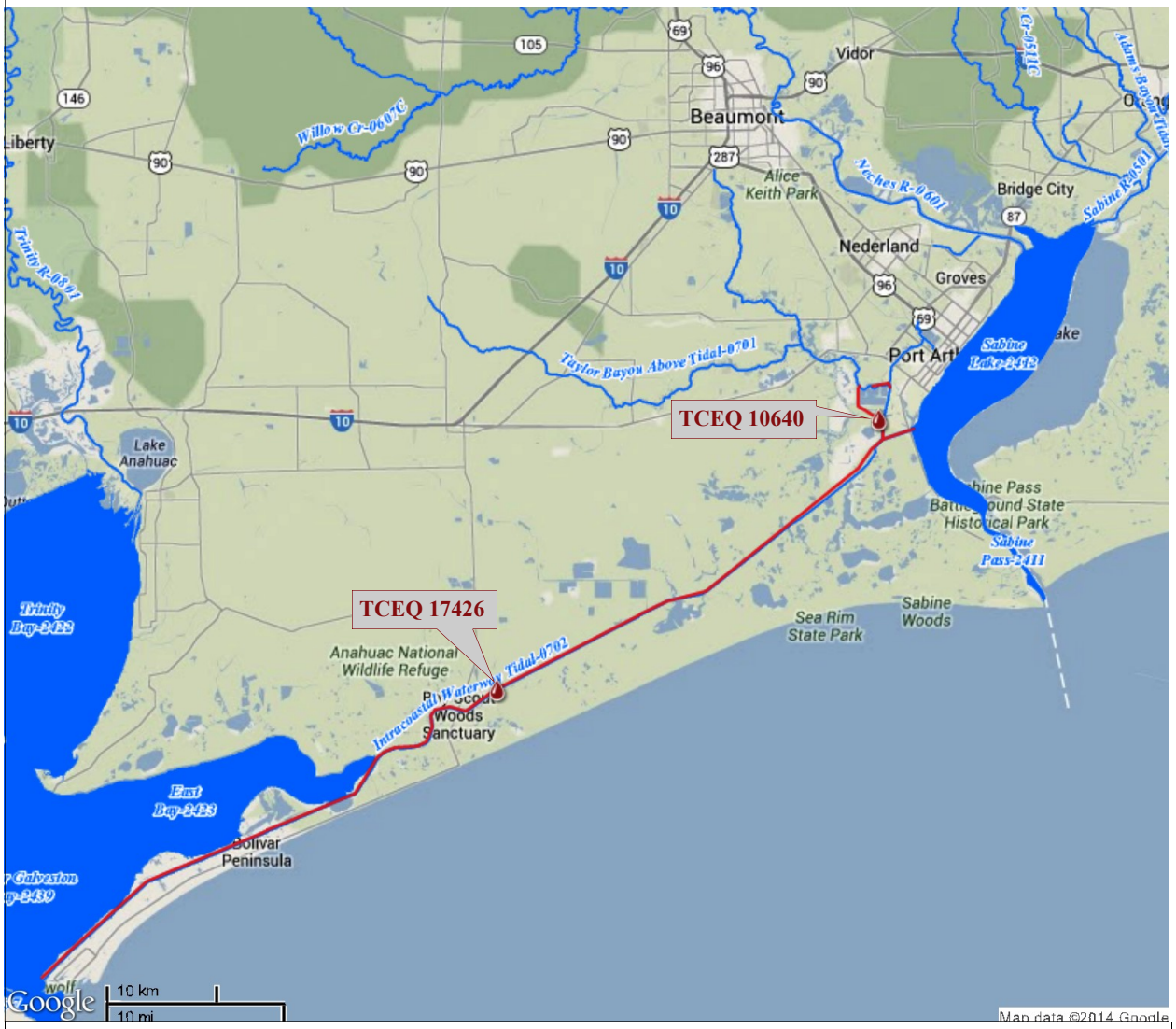
Water Quality Monitoring Stations

SEGMENT: 701 Taylor Bayou/North Fork Taylor Bayou Above Tidal

Site Description	Station ID	Waterbody ID	Basin	Agency	Field	Conv.	Bacteria	Metals in water
TAYLOR BAYOU AT SH 73 WEST OF PORT ARTHUR	10668	0701	7	TCEQ	4	4	4	
TAYLOR BAYOU NORTH FORK AT IH 10	10674	0701	7	TCEQ	4	4	4	
SHALLOW PRONG LAKE ON BIG HILL BAYOU WEST-ERNMOST ARM NEAR FENCE PILINGS	10642	0701D	7	TCEQ	4	4	4	4

Water Quality Monitoring Stations

SEGMENT: 702 Intracoastal Waterway Tidal



Site Description	Station ID	Waterbody ID	Basin	Agency	Field	Conv.	Bacteria
INTRACOASTAL WATERWAY (ICWW) MID CHANNEL AT THE JEFFERSON/CHAMBERS COUNTY LINE APPROX. 5 KM EAST OF SH124 NEAR HIGH ISLAND	17426	0702	7	TCEQ	4	4	4
TAYLOR BAYOU MID CHANNEL 420 M UPSTREAM OF CONFLUENCE WITH INTRACOASTAL WATERWAY TIDAL	10640	0702	7	TCEQ	4	4	4

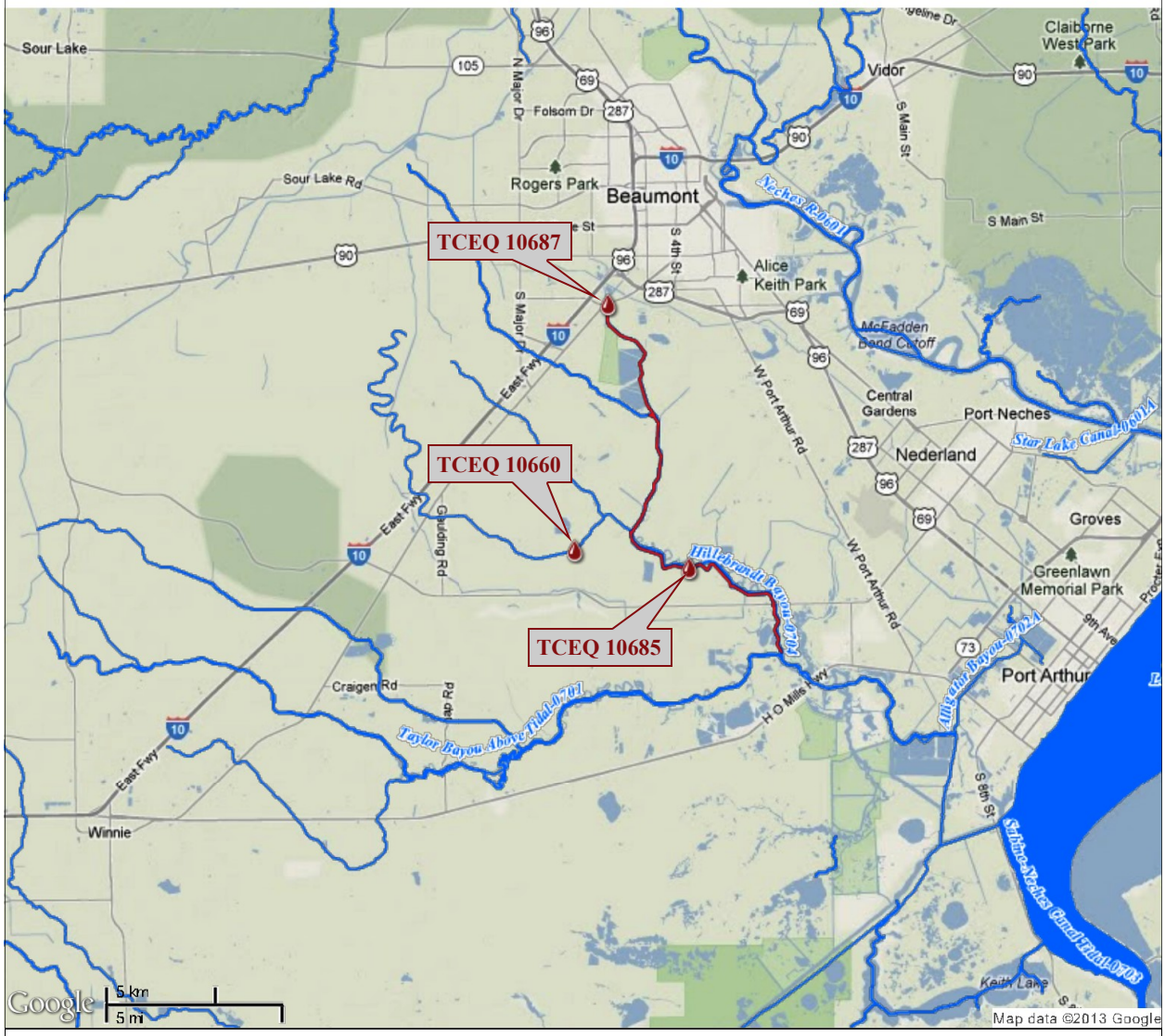
Water Quality Monitoring Stations

SEGMENT: 703 Sabine-Neches Canal Tidal

Site Description	Station ID	Waterbody ID	Basin	Agency	Field	Conv.	Bacteria
SABINE-NECHES CANAL TIDAL MID CHANNEL ADJACENT TO TOPCO DOCKS 340 M SOUTH OF TAFT AVE AT DD 7 LEVEE RD	10683	0703	7	TCEQ	4	4	4
TAYLOR BAYOU TURNING BASIN AT TEXACO DOCK AT CONFLUENCE WITH SABINE-NECHES CANAL TIDAL	10652	0703	7	TCEQ	4	4	4

Water Quality Monitoring Stations

SEGMENT: 704 Hillebrandt Bayou



Site Description	Station ID	Waterbody ID	Basin	Agency	Field	Conv.	Bacteria
HILLEBRANDT BAYOU AT SH 124 IN BEAUMONT	10687	0704	7	TCEQ	4	4	4
HILLEBRANDT BAYOU AT HILLEBRANDT ROAD NEAR LOVELL LAKE 30 M DOWNSTREAM OF MIDDLE OF HILLEBRANDT ROAD BRIDGE	10685	0704	7	TCEQ	4	4	4
BAYOU DIN AT LABELLE ROAD SOUTH OF BEAUMONT	10660	0704D	7	TCEQ	4	4	4