

***BOLIVAR PENINSULA  
SPECIAL UTILITY DISTRICT***

***GALVESTON COUNTY, TEXAS***



**APRIL 2007**

## TABLE OF CONTENTS

	<u>PAGE</u>
I. <u>INTRODUCTION</u>	1
II. <u>WATER CONSERVATION PLAN</u>	5
III. <u>EMERGENCY DEMAND MANAGEMENT PLAN</u>	12
IV. <u>ADOPTION OF PROGRAM</u>	15

### EXHIBITS:

1. Location Map
2. Utility Evaluation Data
3. Water Rate
4. Revised Drought Contingency Plan

## I. INTRODUCTION

### A. PLANNING AREA

The Bolivar Peninsula Special Utility District (SUD) serves the various communities along the Bolivar Peninsula in Galveston County including High Island, Gilchrist, Caplan, Crystal Beach, and Port Bolivar. The narrow peninsula is located in eastern Galveston County just south of Galveston Bay (Exhibits 1, 2). The SUD is headquartered in Crystal Beach. Total permanent population according to CENSUS 2000 DATA is 3853.

The service area includes substantially all of the Bolivar Peninsula, extending far enough inland to take in High Island.

Galveston County makes up the Galveston-Texas City metropolitan area, which is dominated by port activities and petroleum-related industries. Approximately 99% of the county's population, as well as most ports and industries, are located either on the mainland west of Galveston Bay or on Galveston Island. Bolivar Peninsula is connected with the rest of the county by ferry service and is much less urbanized in nature than the rest of the county.

Seafood processing is the dominant manufacturing industry on the peninsula. Tourism is very heavy because of the coastal location, and over 60% of residencies on the peninsula are second homes for seasonal residents.

The SUD provides only water service within its boundaries. Wastewater service consists of small on-site units, with the possible exception of small local systems provided by others.

The SUD water is purchased through contract from the Lower Neches Valley Authority (LNVA). LNVA operates a regional surface water treatment plant in Winnie to serve the SUD.

The area covered by this Water Conservation Plan will include the entire SUD service area. In the event that any areas outside the SUD area receive wholesale water service in the future, such areas would become subject to provisions of the program as required by the TCEQ and/or the TWDB.

### B. PROJECTS

Previously the SUD operated wells in Winnie, Texas as a source of water. The wells were replaced with a surface water plant constructed at a location north of Interstate 10 near State Highway 1406. The plant contains typical clarification, filtration, and disinfection processes as well as chemical feed for iron and manganese control. The plant is owned and operated by LNVA and treated surface water is purchased by the SUD through a contract with LNVA.

The plant requires a raw water pump station on the LNVA canal north of Winnie with 6-1/2 miles of transmission main. A water reservoir is located near the plant, along with a transfer pump from the reservoir to the plant.

A new transmission line from Winnie to High Island is used to transfer water to the SUD.

An additional improvement, funded under the regional project with the LNVA plant, is currently under construction to install an upgraded transmission line from High Island to Singing Sands. The next phase of projects began in March, 2005 and will be funded through loans from the Texas Water Development Board Drinking Water State Revolving Fund. The projects included in this phase include an upgraded water transmission line from Singing Sands to Port Bolivar and construction of an elevated storage tank in the Port Bolivar area.

These projects will provide a good quality water supply for the SUD through the year 2022 while meeting modified TCEQ standards\* for quantity of supply. Also, the projects will provide adequate transmission capacity from the Winnie-Stowell area throughout the entire the SUD service area.

\* The SUD has received a waiver to provide 0.45 gpm of water supply per connection in lieu of the TCEQ standard of 0.6 gpm.

Total costs for these water projects are expected to be approximately \$31 million, administered by the Texas Water Development Board.

#### C. UTILITY EVALUATION DATA

TCEQ provides a Water Utility Profile Form to assist with Water Utility Profile Form to assist with Water Conservation Plan Development. Exhibit 4 contains the current form.

#### D. NEED FOR AND GOALS OF THE PROGRAM

As stated above, the SUD proposes to finance the water project through loans from the TWDB. The loans are expected to be many times the \$500,000 level which is discussed below.

One requirement of any TWDB loan in excess of \$500,000 is that the entity develop a program for water conservation and emergency demand management\* and have the program approved by Board action (TWDB) following TWDB staff review. The approved program, including any stipulations contained in Board approval, must be implemented by the entity before closing of the loan and approved by the Board in an implemented form.

\*Emergency demand management plans are also referred to by the TCEQ as drought contingency plans.

The requirement for the Water Conservation Program is contained in House Bill No. 2 and House Joint Resolution No. 6, 69th Texas Legislature, 1985. This program is required for all communities receiving new state (or state administered) loans of more than \$500,000 for water, sewer, or flood control projects.

Water conservation plans have been required for some years for surface water permit holders. More recently, the 75<sup>th</sup> Legislature passed legislation in 1997 calling for the TCEQ to require water conservation plans for all public water suppliers, regardless of their source of water. The

TCEQ requirements are contained in 30 TAC 288.

The two main divisions of the program are (1) a water conservation plan to reduce water usage on a year-round basis and (2) an emergency demand management plan to minimize hardship during a water shortage. TWDB guidelines prescribe various elements of the water conservation plan and the emergency demand management plan to be considered in designing the program. These elements will be covered in following sections. Note that at least one element of the water conservation plan, a block rate system which does not provide discounts for large volumes of usage, is already in effect.

The total reduction in water usage is expected to be less than the reduction for an average community. The above-average amount of rainfall in Galveston County (42 inches  $\pm$ ) reduces the need for outdoor watering. A large amount of the water usage on the peninsula is associated with recreational activities by visitors and part-time residents. Consequently, the SUD does not feel that long term per-capita usage can be reduced substantially.

In the Southeast Texas area, the need for a water conservation program is not as obvious as for Central or West Texas communities. Ground and surface water have traditionally been available in most of East and Southeast Texas area in abundant quantities. Although the coastal area along the Bolivar Peninsula lacks a local fresh water supply, there has been adequate ground and surface water available from counties to the north. The surface water is available from the Neches River Basin, which is under the same river authority as the Neches-Trinity Coastal Basin where the SUD is located.

However, changing conditions could contribute to a scarcity of water in Southeast Texas in the future. The La Nina cycle which began in the late 1990's has resulted in a drought in the Neches basin during parts of the last several years. The drought cycle has periodically threatened the supply of irrigation water for Southeast Texas. In future decades, such drought cycles could potentially threaten municipal and industrial water supplies also unless additional surface water reservoirs are developed.

Another problem in the future is potential diversion of surface water to other river basins as a result of high population growth in those basins. State or federal policies could possibly encourage or mandate such diversions in the future, to the detriment of areas such as Southeast Texas from which the SUD expects to receive its raw water supply.

Salt water intrusion or other ground water pollution could force some present ground water users to convert to surface water, placing a heavier strain on surface water supplies. Other potential causes of future water shortages include surface water pollution and increasingly stringent federal drinking water standards.

The water conservation program is expected to become more effective in the future if water should become scarce or more expensive. By the time the need arises, local residents will have become better educated in regard to water conservation, and the necessary control mechanisms will already be in place.

The SUD's proposed water supply is presently relatively insensitive to any anticipated drought

conditions. The drought contingency plan applies mainly to various other events which could disrupt the water supply, such as failure of the production, transmission, pumping, or storage facilities.

The SUD's five year goal for reduction of water demand is 225 gallons per capita and the SUD's ten year goal for reduction of water demand is 150 gallons per capita. Under current conditions in Southeast Texas, and especially considering the nature of water usage on Bolivar Peninsula, the SUD feels that little reduction in water consumption is feasible at this time. However, replacement of the main transmission line could reduce water losses which occur from periodic line breakages and possibly also from undetected leaks.

## II. WATER CONSERVATION PLAN

### A. PLAN ELEMENTS

#### 1. EDUCATION AND INFORMATION

##### a. General

The SUD sends at least one annual newsletter explaining the need for water conservation during the season of high usage. To meet TWDB guidelines, the SUD will add at least one more mail-out per year, or alternately printed notices on water bills. Should the need arise the SUD will use additional information methods such as releases in one or more newspapers of local circulation.

Messages will vary from time to time, including items such as suggestions for water savings, information on incremental water and sewer rates, or information on water supply conditions. Many of the distributions may consist of TWDB brochures.

##### b. First Year, Long Term, and New Customers

The distributions are planned for twice a year (*at least once by flyer and other times by printed messages*), just prior to high usage periods.

New customers will be supplied with fact sheets and brochures similar to those mailed out, to the extent necessary to make them aware of the program. The SUD has assembled packets to give to new customers.

#### 2. WATER RATE STRUCTURES

General. For purposes of rate making and establishing service regulations, water supply corporations are under the jurisdiction of the TCEQ, Water Utilities Division, Utility Rates and Services Section. That section of the TCEQ also governs private (investor owned) water and sewer utilities. The requirements for special utility districts are less strict than for private utilities.

A district can set water and sewer rates by action of its Board of Directors. Prior to the effective date of the increase (*the beginning of the first billing period under the new rates*), the SUD must provide the TCEQ with revised service policy pages reflecting its new rates. The SUD must concurrently provide notice to its customers and allow them a chance to protest to the TCEQ. Protests from 10% or more of the customers within 60 days after notice will lead to TCEQ review in a hearing, with possible revision or denial of the increases.

The SUD may also be obligated by the terms of any existing loan agreements (*for existing water facilities*) to meet certain requirements for its rate structures.

Existing Water Rates. Water rates are provided in Exhibit 5.

Proposed Water Rates. The total amount of water rate increase has been estimated at \$22 per month per connection, to be phased in over time. Increases may be applied to the minimum rates with no changes in the increased gallonage rates, or may be applied in part to the gallonage rate. The gallonage rate will increase for higher levels of usage.

Codification of Rate Systems. Rate increases are by ordinance or resolution of the Board of Directors and are submitted to the TCEQ after adoption.

The water rates will be reviewed annually and adjusted if additional revenues are necessary.

### 3. UNIVERSAL METERING

Master meters are placed in front of the SUD's facilities for finished water received from the LNVA Regional plant. Master meters are also maintained at various water plants along the way between the entry point in High Island to Port Bolivar. In addition, all private water usage (excluding firefighting and related drills) is metered. The SUD uses master meters for a few multiple residences, but almost all service is to single homes or establishments with individual meters. The SUD requires individual meters for all new construction unless a waiver is justified by special circumstances.

The SUD currently meters potable water used by its own facilities including the SUD office. LNVA maintains records of any water usage in the plant, as well as any discarded water treatment wastes.

Uses by the SUD which would be impractical to monitor include water line flushing, repair, and sterilization; and firefighting, related drills, and hydrant testing.

The SUD tests meters at the request of customers, or when any problems are noted. The SUD also has a program under which approximately 10% of the older meters are replaced each year. During 2004, the SUD replaced over 2000 meters that were over 10 years old.

Meter testing will be conducted in accordance with state guidelines [annually for 1" meters or larger (*including production and other water plant meters*), every 10 years for smaller meters]. (*In lieu of testing meters smaller than 1", the SUD may continue its existing meter replacement program.*) Testing will also be performed in cases where apparent problems with meters are noted.

### 4. LEAK DETECTION AND REPAIR

The SUD discovers leaks in the distribution system by two methods:

- a. Unexplained decrease in flows at any point in system, or discrepancy in flows between upstream and downstream points.
- b. Leaking line results in water appearing on ground surface.

The SUD locates leaking line segments by valving off the system as needed. The use of electronic listening devices has been found impractical in the rural areas of the peninsula because of noise and distance.

The most significant leaks occur in major transmission lines. The local lines are primarily PVC. Most leaks within local distribution lines occur in service lines and in glued PVC fittings.

Breaks on main transmission lines may require a contractor for repair, depending on the number of breaks and factors such as line depth and accessibility. Other line repairs are performed by SUD personnel using whatever adapters are necessary for similar or dissimilar materials. In the event that leakage results from slippage of fittings, the SUD can replace existing fittings with mechanical joint fittings. Repairs are performed in accordance with Rules and Regulations for Public Water Systems, 30 TAC 290.46 (g), Texas Commission on Environmental Quality, including disinfection.

Unlike typical systems, the SUD system consists essentially of one large trunk line from High Island to Port Bolivar with various laterals along the way, many of which are dead-end lines. Only selected portions of the distribution system are looped, and even within these areas there are some dead-end segments. These looped areas include most of High Island, most of Port Bolivar, and small portions of other communities along the peninsula. In the Crystal Beach area, there are a number of subdivisions which are well looped internally but have only one connection with the main line.

Except for selected locations, any repairs to the trunk line will shut off the water supply to all points south or west of the repair, with the affected areas depending on stored water downstream from the break. Even where local lines form a loop around the break, they will carry only a limited volume of water.

On the other hand, repairs to lateral lines can be made by isolating short segments without affecting large parts of the system. In the few looped areas, some repairs can be made without affecting any customers.

The SUD will consider future line work projects for the purpose of completing loops within the system.

Leaks in the old transmission line from Stowell appear to be the cause of much of the unaccounted-for water, although no quantification of leakage losses is readily available. Approximately 80% of the water produced was sold, according to annual pumpage and sales records from the SUD. Water losses at production facilities are limited to tank overflows. Large amounts of water can be lost any time from major transmission line breaks. There is also the possibility of undetected leakage in the transmission lines and small amounts in lateral lines.

Much of the unaccounted-for water is used for SUD facilities, line flushing, and fire department usage (including hydrant testing and fire fighting).

The General Manager prepares monthly internal reports including total water purchased and total sales. The SUD submits monthly reports to the TCEQ covering total water pumpage, number of active water services, treated water quality, disinfectant usage, and water quality violations (if any).

The best means of reducing unaccounted-for water appears to be to eliminate the periodic line breaks, particularly in the transmission line. Projects underway will include replacing the line from High Island to Port Bolivar with a larger line, and the new line will be designed for whatever pressure rating is required under future operating conditions. Other methods to reduce breaks in that line could include a modified valve arrangement at High Island which would not close the line so abruptly, as well as improvements to the communication system so as to shut off the Stowell high service pumps promptly in the event of downstream problems.

After reducing major losses as discussed above, other measures could include upgraded programs for meter testing/repair and for leak detection/repair in the distribution system. If large amounts of water are still unaccounted for, the SUD may consider measuring or estimating the volume of water used for line flushing. The SUD is also considering the use of automatic flushing valves to better measure water used for line flushing.

Unauthorized water usage is not believed to represent a significant amount of water loss. SUD meter readers are kept posted of any new, removed, disconnected, or reconnected meters. They will generally notice any residential or commercial facility which appears occupied but is not listed as having an active meter. Although a property owner could construct a supplementary tap illegally, most local residents do not have the necessary skills and equipment. Few licensed plumbers would construct an illegal tap for fear of losing their licenses or local permits. Unauthorized use of fire hydrants is believed to be negligible or non-existent.

## 5. WATER CONSERVING LANDSCAPING

Because of the high rainfall, no special landscaping requirements are proposed. In fact, many water conserving plants may not be adapted for the local soils and climate. Customers will be made aware of potential restrictions on lawn watering, however.

## 6. PRESSURE CONTROL

Although the SUD service area is flat, the system is divided into several pressure planes because of distance, with separate planes served by the High Island north, Singing Sands, and Port Bolivar plants. Normally, the pressures remain within an acceptable range and relatively uniform within each pressure plane. The only area known to have had low pressure problems is the Crystal Beach area, served by the Singing Sands plant. There, the problem occurs in the summer, largely from high water usage. Once in the late 1990's the pressure dropped so low as to require a boil water notice. Some of the problem has been resolved by changes in pumping and storage. This issue will also be addressed with the construction of a new elevated storage tank in 2007.

Since no problems with excessive water pressure have been observed within the SUD service area, no measures for reducing pressure within the system or in customer plumbing are necessary.

## 7. RECYCLING AND USE

Any large commercial or industrial users, as well as all car washes, should consider means of recycling process water and wastewater if they are not already doing so. The use of small static screen or filtering devices may prove to be cost effective in comparison to the rates they would have to pay for the SUD's treated water.

Reuse of treated effluent is inapplicable, except for homeowners who may have aerobic disposal systems, and even then only for lawn watering.

## 8. RETROFIT PROGRAM

Retrofitting in existing structures simply for water conservation is unlikely to be accepted by local residents, especially considering the adequate supply of SUD water and the substantial cost involved. Therefore, mandatory retrofitting is recommended only for the following cases:

- a. Replacement of plumbing due to wear, damage, remodeling, or modernization.
- b. Displacement devices in toilet tanks (where practical).
- c. Flow restrictors in showers (where they can be readily installed).
- d. Insulation for hot water pipes (where pipes are accessible without breaking out concrete).

The last three cases represent low cost measures which are easily implemented. However, the SUD proposes to employ these measures only during severe or prolonged water shortages.

## 9. PLUMBING CODES

New plumbing improvements are governed by 1991 legislation (Senate Bill 587) regarding water conservation.

Growth in water service for the SUD areas through the design year 2022 is projected at approximately 24%. Also, many existing homes may undergo modernization or replacement of fixtures within the design period. Therefore, conservation measures in new construction could save a significant amount of water over the next 22 years.

## 10. IMPLEMENTATION AND ENFORCEMENT

- a. Education and Information. SUD personnel under supervision of General Manager.
- b. Water Rate Structure. The necessary increase(s) in water rates to pay for the water system improvements will be by resolution or ordinance, designed to meet any requirements of the Texas Water Development Board including water conservation requirements. Enforcement powers of the SUD includes flow restrictors and termination of water service.
- c. Universal Metering. SUD personnel under supervision of General Manager.
- d. Leak Detection. SUD personnel under supervision of General Manager.
- e. Review and Evaluation. General Manager, who will also submit any required reports to Texas Water Development Board.

- f. Water Conserving Landscaping. Not applicable.
- g. Pressure Control. Pressure control is not applicable as a water conservation measure, since each of the pressure planes into which the SUD area is divided is flat and reasonably compact, with no high-pressure problems.
- h. Recycling and Reuse. General Manager may make recommendations to selected large commercial users if appropriate; action to be taken by users at their option. SUD will, if appropriate, practice a small amount of recycling.
- i. Retrofit Programs. Any mandatory retrofitting would be required under Item j below.
- j. Plumbing Codes. Plumbing within the SUD area is presently governed by state and possibly county requirements. In addition, SUD requirements allow refusal of service (or disconnection) for having a known dangerous condition in connection with water usage.

In addition to local regulations, state legislation adopted in 1991 requires new plumbing fixtures sold within the state to meet certain water conservation standards.

## 10. REVIEW AND EVALUATION

The SUD will review and evaluate the Water Conservation Program at least annually for various areas of concern. The review will cover all items specified periodically by the Texas Water Development Board. In addition to the topics covered in the annual report, the SUD will review the following matters:

- a. Any changes in water supply and/or demand, which require more stringent implementation of the program. This includes both actual and imminent changes (such as an impending shortage of raw water).
- b. Any changes in state regulations which could require modification or more extensive implementation of the program, or which could allow relaxation of any aspects of the program.

## B. IMPLEMENTATION SCHEDULE

The Bolivar Peninsula Special Utility District will adhere to the following schedule, to achieve the targets and goals for water conservation:

- Calibrations of meters for all treated water deliveries are conducted annually.
- The Bolivar Peninsula Special Utility District meter replacement program is as follows:
  - Meters will continue to be monitored for accuracy annually and replaced on a ten-year cycle
- Water audits are conducted annually
  - Real water losses are identified and corrected
  - Real water losses are minimized by replacement of deteriorating water mains and appurtenances, as is conducted by Bolivar Peninsula Special Utility District staff on an on-going basis

- The Bolivar Peninsula Special Utility District will mail out material developed by the staff, materials obtained from the Texas Water Development Board, Texas Commission on Environmental Quality or other sources semi-annually (once in the spring and once in the summer) to all customers
- Water conserving pricing
  - The Bolivar Peninsula Special Utility District current rates are shown in Exhibit 3.
  - The Bolivar Peninsula Special Utility District will continue to review rates annually to insure water revenues exceed expenses and replacement costs and to discourage excessive and wasteful use
- The leak detection program described in the plan is currently in use by Bolivar Peninsula Special Utility District, which reduces real water losses
  - Intermittent night-flow measurements are conducted annually
  - Pressure is controlled to just above the standard-of-service level by use of SCADA system
  - Pressure zones are operated based on the topography
  - Surges in pressure are limited by control valves
  - Nighttime pressure is reduced by control valves when feasible
- The Bolivar Peninsula Special Utility District encourages the use of water conserving fixtures in new construction or renovations within the District

### **Tracking Targets and Goals**

The staff shall track targets and goals by utilizing the following procedures:

- Logs shall be maintained for meter calibration, meter testing, and meter replacement programs
- Annual water audits shall be documented and kept in the Utility Department files
- Staff shall keep a record of the number of mail-outs distributed semi-annually
- Rates are tracked by means of an adopted policy by the Board of Directors
- Logs shall be maintained for the utility's Leak Detection Program, including but not limited to annual intermittent night-flow measurements, and SCADA system.

### C. **REPORTING TO TWDB**

The SUD will submit reports to the Texas Water Development Board as required, covering all elements prescribed by the TWDB, for the life of any loans which the SUD might obtain from the TWDB (unless otherwise released by the TWDB).

### D. **CONTRACTS WITH OTHER ENTITIES**

The SUD currently has no contracts with other entities for supply or purchase of water, or for wastewater service. Any future contracts to supply water or sewer service to outside entities will contain provisions to make water conservation provisions applicable to those entities.

### III. EMERGENCY DEMAND MANAGEMENT PLAN

#### A. GENERAL

1. Sources of Water. The SUD currently purchases its water supply from the LNVA's new surface water plant at Winnie, with a raw water intake on the LNVA canal at Winnie. The source of the LNVA canal water is the Neches River along with Pine Island Bayou.

The LNVA draws its water from several intakes on the Neches River and on one of its large tributaries, Pine Island Bayou. The Neches River intake is located north of Jefferson County, while the Pine Island Bayou intakes are located along the north line of Jefferson County. The Neches River has a drainage area of approximately 10,000 square miles, most of it falling in the high rainfall area of East Texas.

The SUD is maintaining two of the northmost wells in Winnie as standby water sources in event of problems with the surface water supply.

2. Interruptions - General. Local water supplies could be interrupted for a number of reasons. One likely event is power failure. Power failure sometimes occurs at various water plants within the service area, and if it occurs at plants without generators, the water supply from upstream must be shut off to prevent tank overflows. The supply is currently shut off by an actuated valve at High Island, and the abrupt shutoff sends a shock wave upstream until it breaks the transmission line, thus causing further delays in restoring the water supply.

Breaks in transmission lines, including the type discussed above, can shut off the supply to all or part of the system until they can be repaired. When that occurs, the affected portion of the system must depend on water already stored in tanks downstream from the break.

Potential service interruptions could result from drought or stream contamination upstream from the canal intakes. Other potential causes of interruptions include failures of intake facilities or the force main between the canal and the surface water plant.

Other possibilities include equipment failure, storage or pressure tank failure, severe storm damage, severe freezing conditions, and failure of the disinfection facilities.

3. Production Facilities. The surface water purchased from LNVA travels from the plant in Winnie to a 1 mg ground storage tank located at Stowell. Three high service pumps, 1180 gpm each, pump from that tank into the transmission line to High Island. The pumps operate on demand according to remote signals from the two High Island plants located downstream within the service area.

The surface water plant is contains typical surface water treatment units including flocculation, clarification, filtration, disinfection, and any other necessary chemical feed.

3. Water Plants within Service Area. The SUD water plants downstream from the Stowell plant do not contain production facilities, but only pumping, storage, pressure maintenance,

disinfection, standby power, and/or control facilities.

- < High Island (north): 0.5 mg ground storage; 15,000 gallon hydropneumatic tank; 3 ~ 1180 gpm high service pumps. This plant serves High Island only.
- < High Island (south): 1 mg ground storage; 0.25 mg elevated storage; 3 ~ 1180 gpm high service pumps; chlorination; standby generator. This plant serves only as a storage and pumping station for service areas downstream on the peninsula.
- < Singing Sands. 1 mg and 2 mg ground storage; 3 ~ 1200 gpm high service pumps; disinfection; standby generator.
- < Crystal Beach. 0.25 mg elevated storage; adjacent office contains remote control facilities for entire system; standby generator.
- < Port Bolivar: 1 mg ground storage; 10,000 gallon hydropneumatic tank; 3 ~ 500 gpm high service pumps.

The various water plants are needed to provide pumping and storage capacity for the system because of the distance from the surface water plant to the upstream end of the system at High Island as well as the additional length of the system. The storage capacity is essential because of the potential for interruption of the water supply.

4. Distribution System Conditions. The backbone of the system is a series of transmission line segments from High Island to the far end of the system at Port Bolivar. The first segment extends approximately 15 miles from Stowell to High Island, where it supplies both a local plant and a booster plant which in turn serves downstream areas. The next twelve-mile segment leads to the Singing Sands plant on the peninsula. The next segment leads to the Bolivar plant, from which the last few miles of the peninsula is served.

At various points from High Island to Port Bolivar, various lateral lines branch off to serve local areas. Many laterals are dead end; some contain a single connection followed by a looped area, while several areas are well looped with multiple connecting points.

The upstream transmission line is 20" ductile iron from the LNVA plant in Winnie to High Island. The line segment from High Island to Singing Sands is a 20" line. The water line from Singing Sands to Port Bolivar is currently a 12" line, but will be upgraded to a 20" inch line in 2007.

Failure of any transmission line segments would cut off the water supply to all downstream areas, except for small amounts of water which could flow through local lateral loops in some areas. The water plants along the service area provide storage for up to several days.

## B. SUD'S DROUGHT CONTINGENCY PLAN

The SUD originally adopted a drought contingency plan designed to meet TCEQ requirements on January 14, 2000. The plan was amended and adopted on April 14, 2005. That plan is included as Exhibit 6. Further revisions may be required for additional corrections; to receive any necessary approvals from the TCEQ or from the Region H water planning group; and/or to adjust to any new source of supply in the future.

Various events which could result in water shortages or reduction in service include the following:

- a. Water Supply. Equipment failure in the surface water plant, the related intake station; or the transfer pump from the raw water reservoir to the plant; shortage or contamination of the raw water supply; levee breaks in the canal system or the raw water reservoir; failure of the raw water transmission line.
- b. Water Transmission. Transmission line breaks on various lines which are the sole connections for outlying portions of the system.
- c. Storage. Structural failure or contamination in ground storage or elevated tanks.
- d. Pressure Maintenance. Structural failure of hydropneumatic tanks; power or equipment failure involving booster or service pumps.
- e. Treatment. Failure of chlorination equipment at downstream water plants.
- f. Distribution System. Major line breaks; heavy demands for firefighting; contamination.

The SUD is maintaining two of the northmost wells as standby water sources. If a water shortage arises from a problem with the source, the SUD could draw from the alternate supply to the extent that water is available from that supply at the time. The SUD may thus be able to avoid activating the drought contingency plan, or may be able to reduce the extent or duration of drought contingency measures. However, there is no available alternate source which could supply the SUD if the problem is in the transmission line or within the service area.

Any future contracts to provide water and/or wastewater service to wholesale entities (such as water districts and water supply corporations) will contain provisions making those entities subject to provisions of the SUD's Drought Contingency Plan. *(This will not apply to contracts for emergency service only.)*

#### IV. ADOPTION OF PROGRAM

The SUD will adopt the entire water conservation program, including the Drought Contingency Plan with any revisions, by resolution and will incorporate it into its service policy as appropriate.

# EXHIBITS

# EXHIBIT 1

## LOCATION MAP

## EXHIBIT 2

### UTILITY EVALUATION DATA

EXHIBIT 2

UTILITY EVALUATION DATA  
BOLIVAR PENINSULA WATER SUPPLY CORPORATION

1. WATER SUPPLY AND DISTRIBUTION SYSTEM INFORMATION

- A. Population of service area (estimated, 2000) 3479\*  
 (\*permanent population; population increases to over 18,000 during summer season)
  
- B. Area of service area 58 square miles
  
- C. Water production and sales information
  - (1) Water supplied during the last year (gal.) 282,441,000 gal.
  - (2) Average water supplied for last 2 years 294,392,500 gal.
  - (3) Monthly water sales by user category for last year

Month	Residential (Gallons)	Commercial (Gallons)	Industrial (Gallons)	Total (Gallons)
<b>January</b>	13,189,000	1,140,000	914,000	15,243,000
<b>February</b>	10,660,000	1,316,000	999,000	12,975,000
<b>March</b>	13,969,000	1,346,000	1,003,000	16,318,000
<b>April</b>	18,246,000	1,647,000	1,741,000	21,634,000
<b>May</b>	18,156,000	1,552,000	1,909,000	21,617,000
<b>June</b>	26,792,000	1,786,000	1,649,000	30,227,000
<b>July</b>	27,878,000	2,276,000	1,544,000	31,698,000
<b>August</b>	22,503,000	1,463,000	1,691,000	25,657,000
<b>September</b>	21,270,000	1,476,000	1,606,000	24,352,000
<b>October</b>	14,644,000	1,132,000	1,736,000	17,512,000
<b>November</b>	12,752,000	1,129,000	1,611,000	15,492,000
<b>December</b>	12,544,000	1,180,000	1,022,000	14,746,000
<b>Totals:</b>	212,603,000	17,443,000	17,425,000	247,471,000

Apartment and mobile home park sales are not applicable. There are no apartment complexes within the service area, and the few mobile homes are metered individually. Mobile home parks are not feasible in the area because of high flooding from tropical storm surges.

Exhibit 2 (cont.)

- |  |                     |
|--|---------------------|
| (4) Highest daily water use on record            | 2,470,000 gal./day* |
| *From 1995-2006 records; occurred July 22, 2003. |                     |
| (5) Peak daily use for last year                 | 1,899,000 gal./day  |
| (6) Unaccounted for water                        | 5.47%               |

D. Number and type of meter connections in service area

5929 residential      120 commercial      62 industrial

E. Net gain of new connections per year

142 residential    7 commercial/industrial

F. Source of water:

Surface water plant owned by LNVA at Winnie, raw water from LNVA canal near Winnie

G. Safe annual yield: 1551 million gal./yr., based on plant capacity, assuming adequate raw water supply.

H. Design capacity of water system: 5 million gallons per day.

I. Major high volume customers:

<u>Customer</u>	<u>Fiscal Year 2005 Water Usage (gallons)</u>
QV Services	2,491,000
Crystal Palace Motel	2,192,000
United Seafood	1,248,000
Milts Seafood	1,176,000
Bolivar Terminal	1,128,000
Bob Wortham	1,121,000
Stingaree Restaurant	934,000
Crystal Beach Plant Farm	866,000
United Seafood	864,000
Ben Bruce Seafood	687,000

Exhibit 2 (cont.)

J. Population and water use projections

Year	Population	Daily average (mgd)	Daily maximum (mgd)*
2000	3478	0.68 mgd	1.632 mgd
2022	4329	0.85 mgd	2.04 mgd

\*Calculated as 2.4 times average daily demand.

2. WASTEWATER SYSTEM INFORMATION

**Not applicable – the SUD does not operate a sewer system.**

3. UTILITY FINANCIAL OPERATIONS INFORMATION

A. Water rate structures:

Customer Deposit	\$ 150.00
Cross-Connection Testing Fee	\$25.00
Installation of New Service/New Meter	
5/8"	\$950.00
3/4"	\$1,045.00
1"	\$1,425.00
1 ½"	\$1,900.00
2"	\$2,850.00
2.5"	\$3,325.00
3"	\$3,800.00
Monthly Minimum Rate (includes 2000 Gallons):	
5/8"	\$46.00
3/4"	\$50.60
1"	\$69.00
1 ½"	\$92.00
2"	\$138.00
2.5"	\$161.00
3"	\$184.00
Gallonage Rates (per 1000 gallons)	
2,001-6,000	\$3.00
6,001-10,000	\$3.25
10,001-20,000	\$3.50
20,001-50,000	\$3.75
50,001 plus	\$4.00

Exhibit 2 (cont.)

B. Sources of revenue.

Percent of annual revenue from water rates	92.4%*
Percent of annual revenue from other sources	7.6%*

C. Average annual operating costs

(1) Total average annual operating costs	\$3,982,825.00
(2) Percent that are fixed costs	75.2%
(3) Percent that are variable costs	24.8%

## EXHIBIT 3

# WATER RATES

Exhibit 3  
Water Rates

Monthly Minimum Rate (includes 2000 Gallons):	
5/8"	\$46.00
3/4"	\$50.60
1"	\$69.00
1 1/2"	\$92.00
2"	\$138.00
2.5"	\$161.00
3"	\$184.00
Gallorage Rates (per 1000 gallons)	
2,001-6,000	\$3.00
6,001-10,000	\$3.25
10,001-20,000	\$3.50
20,001-50,000	\$3.75
50,001 plus	\$4.00

## EXHIBIT 4

### Drought Contingency Plan