Exhibit 4

SEWERAGE AND WATER BOARD

OF

NEW ORLEANS

MODIFIED EXHIBIT 4
MODIFIED SEWAGE OVERFLOW ACTION PLAN
(December 31, 2008)

MODIFIED SEWAGE OVERFLOW RESPONSE ACTION PLAN
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PLAN OVERVIEW

The Sewage Overflow Action Plan (SOAP) is the Sewerage and Water Board of New Orleans' (Board) systematic approach to responding to overflows occurring in the Sanitary Sewage System. This document presents the Plans and Policies that define the role of the Board and its employees in responding to situations commonly experienced in managing Sanitary Sewer Overflows (SSOs), as well as providing guidance and assuring adequate resources for those situations which cannot be completely anticipated.

The SOAP identifies in detail those standard operating procedures and the individual responsibilities necessary to respond to SSO's in an effective and expedient manner. This SOAP also serves as a training tool for Board employees. The document has been organized into the following sections:

SECTION 1 - INTRODUCTION provides a general description of the Sewer Collection System and identifies the Departments/Divisions that are involved in the Response Action Plan. This section also provides a general description of the activities related to responding to SSO's. It also includes a list of Response Time Goals.

SECTION 2 - DEPARTMENTAL PROCEDURES identifies each organization within the Board responsible for directly responding to Sewer System Overflows. Along with a description of the organization and its staffing are detailed procedures and policies identifying the specific actions of individuals responsible for remediating an overflow condition.

SECTION 3 - COMMUNICATION AND REPORTING specifically identifies the information flow associated with identifying, documenting, responding to and reporting SSO's. Information is tracked from the initial Service Request to the monthly E.P.A. and La. D.E.Q. reports.

SECTION 4 - SANITARY SEWER OVERFLOW CONTAINMENT PLANNING provides guidance for handling sewer overflow material. Considerations are discussed for making site-specific decisions during an emergency. Final decisions will have to be determined on a case-by-case basis.

SECTION 5 - AVAILABLE EQUIPMENT provides a listing of vehicles and equipment by Department/Division available for responding to SSO's. Also listed is standard equipment assigned to each type of vehicle.

It is important to stress that the data and procedures contained in this document will change over time, as equipment is replaced, new systems are installed, or computer software is updated and modified as procedures are improved. Therefore, this plan should be reviewed as a "living document", the contents of which will be modified as necessary to stay current.

SECTION 1
INTRODUCTION

1.1 ORGANIZATION

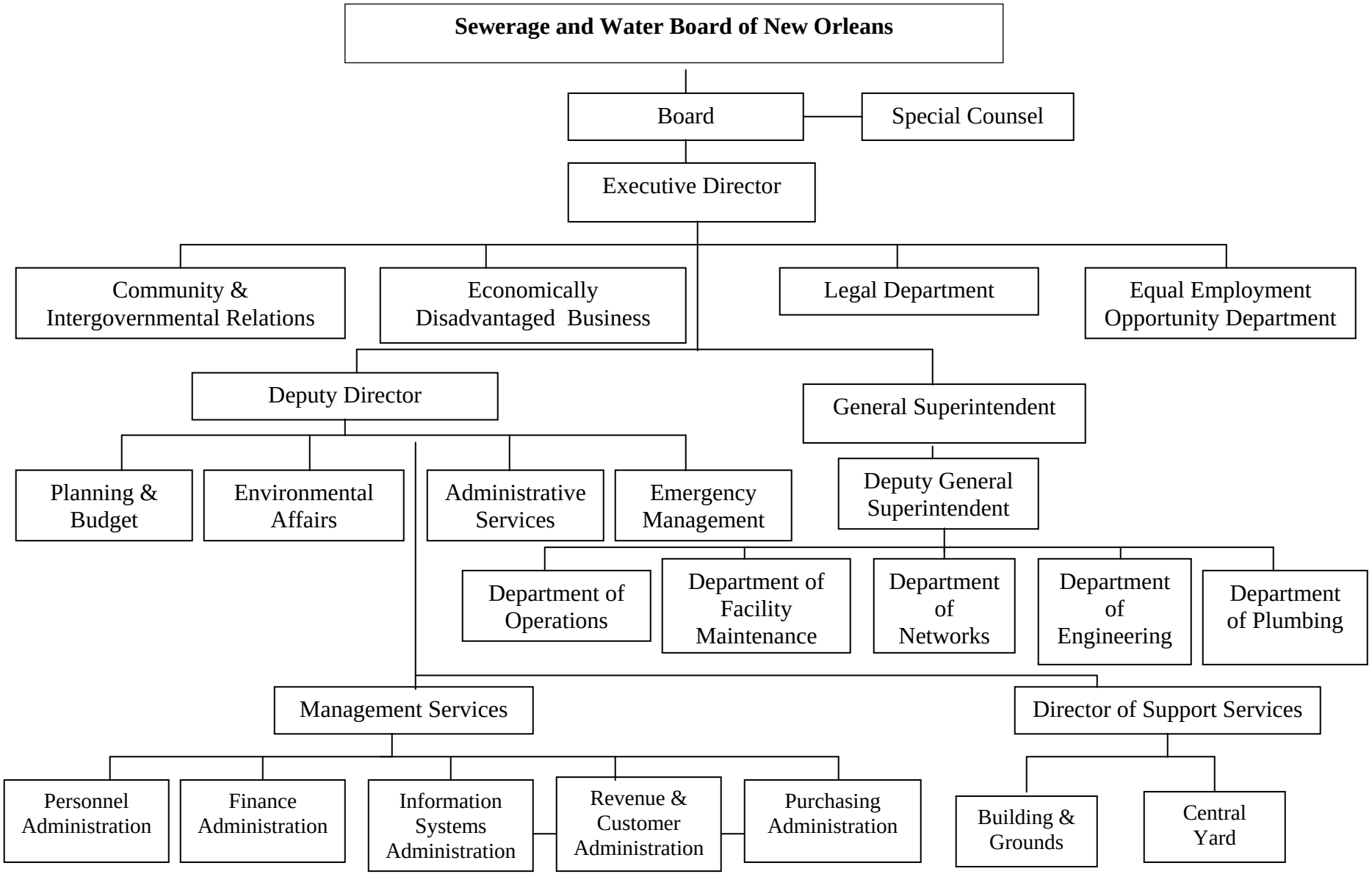
The Sewerage and Water Board of New Orleans (Board) is responsible for the installation, operation and maintenance of the public drainage, water and sewerage systems. The sanitary sewerage system of the City is a gravity collection system consisting of 1600 miles of lateral and trunk sewers, ranging in size from 6 inches to 7 feet in diameter. Lifting and conveying the sewage by trunk sewers and over 100 miles of sewer force mains requires 84 electrically operated pumping and lift stations.

The Operations, Facility Maintenance and Networks Divisions have the primary responsibility for responding to (SSOs). See Figure 1.1. The Environmental Affairs group is responsible for all regulatory reporting and enforcement associated with SSOs from the sewer collection system.

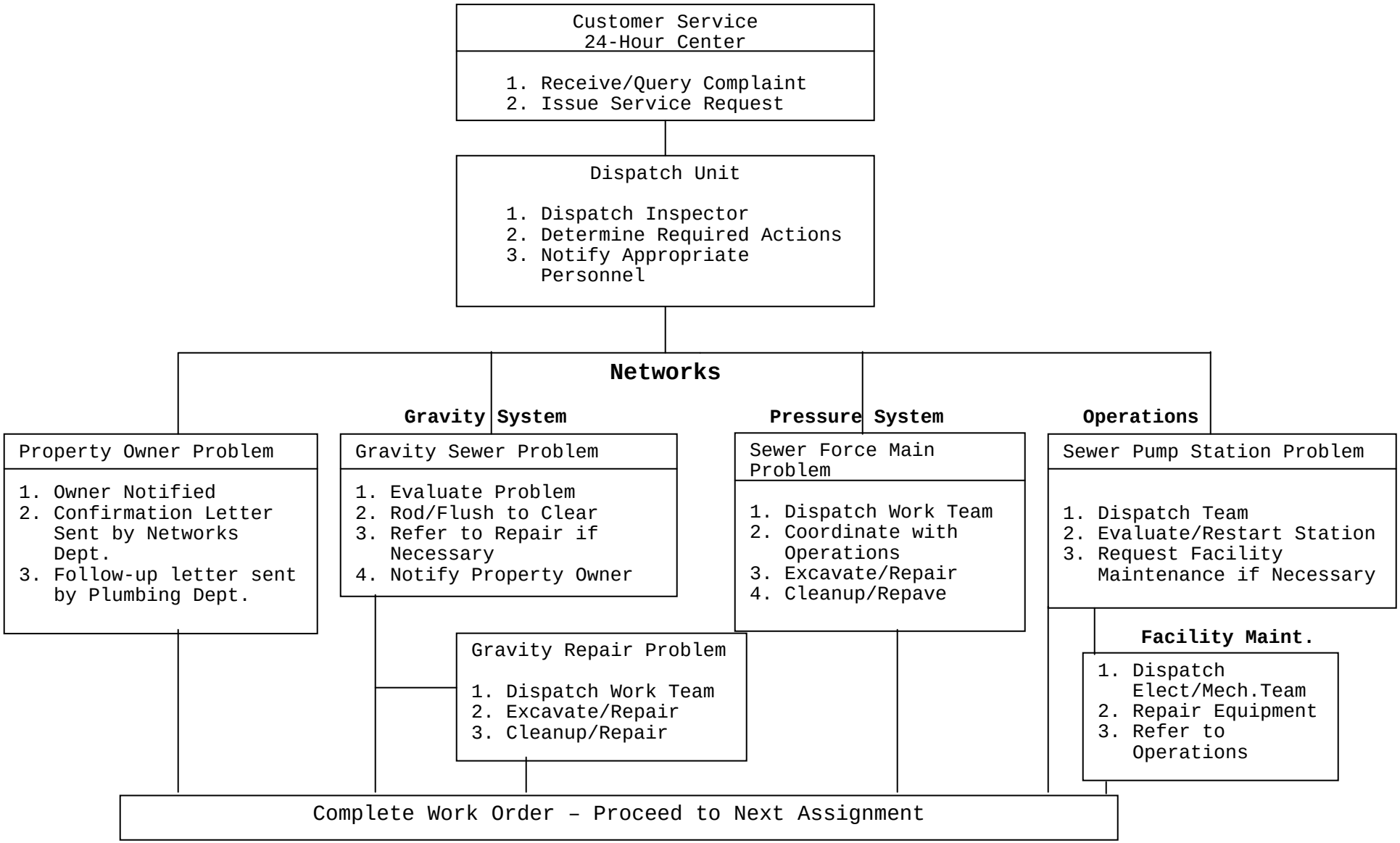
The Board is committed to responding quickly and decisively to mitigate any overflows from the sanitary sewer system. Over the last several years the Board has developed a procedure for responding to reported overflows. Figure 1-2 is the "decision tree" which the Board follows in addressing overflow problems.

In order to more accurately identify and improve the response times for sanitary sewer overflows, the Board has prepared this document. This plan lists the activities required to carry out the Board's Plan for responding to SSOs as well as the resources provided to fulfill the Plan.

SEWERAGE AND WATER BOARD OF NEW ORLEANS ORGANIZATIONAL CHART
FIGURE 1-1



RESPONSE ACTION PLAN (GENERAL)
FIGURE 1-2



1.2 BACKGROUND

The first priority of the Sewerage Overflow Action Plan is to have the ability to handle emergency service requests quickly and efficiently so as to avoid adverse impact to the public's health and environmental factors. Emergency sewer service requests usually consist of calls to relieve collection line stoppages and to correct lift station, pumping station and force main failures. Quickly clearing stoppages before overflows and damage occur is a major concern. Sewer line stoppages can develop when obstructions slow down the flow of wastewater, gradually forming a blockage or choke in the gravity system.

The historical data which is being used to direct follow-up maintenance work and develop preventive maintenance plans, stoppages are identified according to their cause or type of problem. Stoppages result from obstructions such as grease, debris, broken pipe, offset joints or a joint failure. These obstructions may require removal, repair or replacement.

1.3 EMERGENCY SEWER SERVICE CALL PROCEDURES

Most emergency calls are related to stoppages and these will be classified in two categories: (1) Main line and (2) Sewer House Connections.

A gravity main line stoppage can be a major problem and can affect a number of customers on that portion of the collection system. Gravity main line stoppages are identified by a customer who notifies the Board, by telephone, that a sewer house connection or manhole is overflowing.

In contrast, a sewer house connection stoppage usually affects only the home or business establishment that is backed up. Typically, the resident telephones the Board when a sink does not drain into the sewer system.

In either of the above cases, the phone center operator receiving the call first queries and then records all available relevant information into the Board’s service request database used to track the Board’s work. The information is then electronically transmitted to the Emergency Dispatch Office.

The Emergency Dispatcher radios the Emergency Inspector and provides the address, location, nature of the problem, name of the complainant, and the information obtained from the Board's database that may be relevant to the site, including any pending job reports.

If multiple emergency calls are received at the same time or there is a temporary backlog of service requests, they are prioritized. Sewer Overflows are given the highest priority ranking.

Once on the scene, the Inspector assesses the existing condition and makes a determination of the type of problem (obstructed gravity sewer main or sewer house connection, pumping station failure, sewer force main failure, or defect on private property). This information is forwarded to the Emergency Dispatcher who contacts the appropriate Division Supervisor (Operations for pumping stations, Networks Zone Manager or designee for choked mains, house connections or force main failures).

1.4 GRAVITY LINE OBSTRUCTION PROCEDURES

1.4.1 - Sewer House Connection Stoppage

At present, approximately 80% of all sewer emergency service requests result from a sewer house connection stoppage or “Choke”.

1. When a sewer house connection stoppage is reported, upon arrival, the Maintenance Team

inspects the gravity main. Inspection of the upstream and downstream manholes on the gravity line will verify if the main line is down and flowing. If the gravity line is not flowing, the Maintenance Team inspects the gravity line until the area of the stoppage is located and cleared.

2. If the gravity line is open and flowing, the Maintenance Team proceeds to the customer's address. The service line cleanout is inspected to determine if the portion of the service line from the property line to the gravity line is open and clear. The determination is achieved by removing the cleanout cover and visually inspecting the cleanout. If it is found blocked, the cleanout and lateral lines are cleared to eliminate the obstruction. If this cannot be accomplished, depending on conditions observed by the Maintenance Team on site, the problem might be referred to a Flushing Team.

3. If the obstructive material cannot be removed, the closest available Networks Repair Team is routed to the emergency repair jobsite. Utilizing available information, the site is excavated at the point of the obstruction. The broken or blocked pipe section is repaired or replaced.

4. The site is restored and cleanup of any discharge will include an attempt to collect all discharge flow and return it to the sanitary system. A flushing truck may be utilized if the cleanup is extensive.

1.4.2 - Gravity Line Stoppage

At present, approximately 20% of sewer emergency service requests result from a gravity line stoppage, and can present an overflow condition. On a gravity main line stoppage, the Maintenance Team examines the maps to determine direction of flow. The downstream manhole is inspected and observed for no flow or restricted flow. When a manhole that is downstream and flowing is located, the stoppage is located between this manhole and the upstream manhole. The problem could also be at a pumping or lift station or directly upstream prior to the first upstream manhole.

The method for clearing a main line stoppage is similar to the procedure described above (flushing) with the exception that a stoppage may result from a failure at a sewage pumping or lift station. Debris from the cleaning is collected, where possible and removed from the sewer system.

1.5 LIFT AND PUMP STATION FAILURE PROCEDURES

Lifting and conveying sewage by trunk sewers and sewer force mains requires 84 electrically operated pump and lift stations, of which 81 are automatically operated. Of these stations, 66 are on the East Bank and 18 are on the West Bank of the Mississippi River. Pump stations discharge into a force main and lift stations pump to gravity mains that flow to other lift or pumping station(s).

Sewer stations “A” and “D” on the East Bank and Station “C” on the West Bank are large attended pump stations (manned 24 hours per day). These attended stations and the automated stations transfer the total collected sewage from the entire city to the two treatment plants, one on each side of the Mississippi River.

Power is provided to stations “A”, “C” and “D” at 60 Hz and 25 Hz. Power is provided to all of the automatic lifting and pumping stations at 60 Hz. Entergy, the local electrical power provider, supplies power at 60 Hz. The Sewerage and Water Board’s Power Plant provides power at 25 Hz. and backup 60 Hz power.

Failure of the lift and pump stations (because of equipment failure, power failure, severe flooding, etc.)

may result in sewage surcharge and overflowing at manholes and cleanouts. In addition, there is a real threat that sewage may backup into business establishments or residences raising concerns of possible public health hazards. In these situations, auxiliary pumps will be utilized to assist in handling the flow. Overflowing sewage will be contained, if possible, and redirected and put back into the sewer system.

1.6 SEWER FORCE MAIN FAILURE PROCEDURES

Sewer force main failures have the potential for significant damage. Force main failures can create a large spill in a short period of time and can sometimes affect a larger section of the sewerage system than a gravity main line blockage, complicating coordination of the repair. Response to a force main failure may call upon every organizational group within the Board having responsibility for operation and maintenance of the sewerage system including the wastewater treatment facility. Force main failures can result from a variety of conditions including age of components, subsidence, water hammer, corrosion or material failure.

Excavation and repair of force main components takes place after the affected section of the system is isolated, drained, and considerations have been made for the possible containment and subsequent clean-up of any sewage overflows.

1.7 SPILL CONTAINMENT

The Board's first priority in operating its sewer system is to protect the public health of the citizens and the environment in the most cost effective manner possible. The Board is continuing to improve its capabilities in these areas.

To this end, the Board will bypass, direct, and temporarily store sewage as the situation dictates to avoid contamination of soil, street, etc. that would place the citizens in contact with waste products. If these sewer wastes reach a canal it will be the Board first effort to remove the contamination.

In those circumstances when sewage cannot be removed from the canal system because of location or weather, where possible, the procedures will be to dilute and flush the canals. Planning for spill containment is addressed in Section 4.

1.8 QUANTIFIABLE MEASURES/GOALS

Response to SSO's must be immediate and quick. Response Time is the time between receiving the report of an overflow and the time the Inspector arrives at the scene. Remedial correction is the time spent assembling repair materials, correcting the SSO and the final correction to defective facilities. Response Time will vary with the nature of the problem. The Board makes a distinction between the remedial corrective actions to remediate a SSO, the precise location and time of which cannot be predicted, and those that result from natural disasters like a flood or hurricane that are not related to preventive maintenance. The problems faced by the Board reflect the varied condition restraints, time frames, constraints, requirements, material availability and situations in the field encountered in New Orleans.

The Quantifiable Measures/Goals for this SOAP are reflected in the table that follows. See Table 1 on page 11. In developing this chart, variables such as the 1) number of concurrent SSOs; 2) initial reporting characterization; 3) travel distance/accessibility; 4) time of reporting (day/night); and 5) weather conditions affect the response time.

The Board, through its negotiations with USEPA, has established composite Inspector/Maintenance Team response times that will apply in terms of compliance with this SOAP as follows:

TABLE 1
RESPONSE TIME QUANTIFABLE MEASURES/GOALS

CONDITION	RESPONSE TIME
Daytime Response Time	4 Hours
Night, Holiday, Severe Weather Response Time	6 Hours

Actual Response Times will be dependent upon circumstances and conditions at the time an SSO is reported. In those instances that an SSO is incorrectly reported as some other type deficiency, then discovered to be an SSO, the first report time will be logged as the time of first discovery in the field and not the initial mis-reporting of the incident.

Table 1 reflects Response Times which are realistic and obtainable. It is expected that all Response Times will be improved upon as experience is gained. The Response Times reflected in the table are more responsive than those experienced in recent surveys of Response Times.

1.8.1 - Discussion of Chart Variables

1.8.1.1 - Number of PRIORITY A Occurrences

Responding to multiple Priority A (priority definitions can be found on Table 2 in Section 2) occurrences affects response time goals by possibly placing the Inspector out of the area for the next Priority A response. By definition, all SSOs are Priority A occurrences. Responding to multiple Priority A occurrences takes more time than responding to one. However, it does not follow that responding to two Priority A jobs will take twice as long as responding to one Priority A. As a general matter, the Board's experience confirms this point.

For example, an Inspector servicing a Priority A problem at the extreme tip of New Orleans in Venetian Isles will have a much longer response time than set out in Table 1. If a second Priority A problem requires the Inspector to travel to the Audubon Park neighborhood, a much shorter response time can be expected if the second Priority A problem arises only a few blocks away in the Venetian Isles subdivision. Because the Board seeks to deploy the team which can be directed to the Priority A problem in the shortest time possible (usually the team physically closest to the Priority A), problem Response Times are often shorter than those set out in Table 1.

1.8.1.2 - Day/Night, Holiday, Severe Weather Response Times

Response Times vary depending on whether it is day-time or night-time, or if there is a holiday. Severe weather also can affect Response Times. At night, darkened visual conditions can make the locations of SSO more difficult and time consuming. Similarly, in severe weather conditions, detecting SSOs is more difficult and will require more time to locate. On holidays, reduced staffing levels will also tend to increase Response Time.

1.8.1.3 - Complicated Overflow Problem

After the Inspector has arrived at the reported overflow site, the analysis of the problem starts. On routine problems the Inspector is expected to call for a Maintenance Team with the proper tools and material within 15 minutes after arrival. On more complicated

problems, Zone Managers, Planner Schedulers, and Engineers may have to be called out to view and analyze the problem. This time will vary with the situation. To analyze these complex problems will take more time and will be in addition to the Inspector's Response Time Goals and the Maintenance Team's Response Time Goals. No goal has been set for the remediation of the overflow, but the Maintenance Teams will diligently pursue temporary remediation on effective permanent repairs. Maintenance Teams also work all shifts, but additional teams are capable of being recalled for overflow remediation.

SECTION 2
DEPARTMENTAL PROCEDURES

2.1 GENERAL

The specific procedures comprising the SOAP are the result of extensive research, data collection, and verification of the practices of the Board. These management objectives and planned approach represent the combined efforts of various departments and divisions of the Board. The Board will meet the SOAP's objectives through close coordination, communication, and cooperation.

Each section below will discuss the organizational structure within the respective group and identify staffing as well as resource commitments. In order to identify the specific areas of responsibility within the organizational structure, each sub-section includes a workflow chart listing the systematic responses taken within each organizational group and then identifies the detailed procedures employed to discharge these responsibilities.

2.2 EMERGENCY RESPONSE

2.2.1 - Organization

The 24-Hour Customer Service Center is the first response to customer reports of possible SSOs. Typically, customer reports are the result of slow flowing or backed-up sewage in buildings, overflows at sewer house connection cleanouts, sewer manholes, sewage discharges due to force main breaks, or possibly odor complaints.

Figure 2-1 on page 15 (Emergency Response Flow Chart) details the activities that occur within this group. This facility is centrally located within the City of New Orleans. Figure 2-2 on page 16 details the departmental breakout of the General Superintendent's office.

The 24-Hour Customer Service Center is staffed and responds to emergency service 24hrs/day, 7days/week. The Customer Service Center utilizes the Asset and Facility Maintenance System, currently CASSWORKS, to record and track the progress of all service requests and work orders. PCs are used to access the Asset and Facility Maintenance System, which is on the Board's Local Area Network (LAN).

The Asset and Facility Maintenance System records service requests and prioritizes work orders as follows:

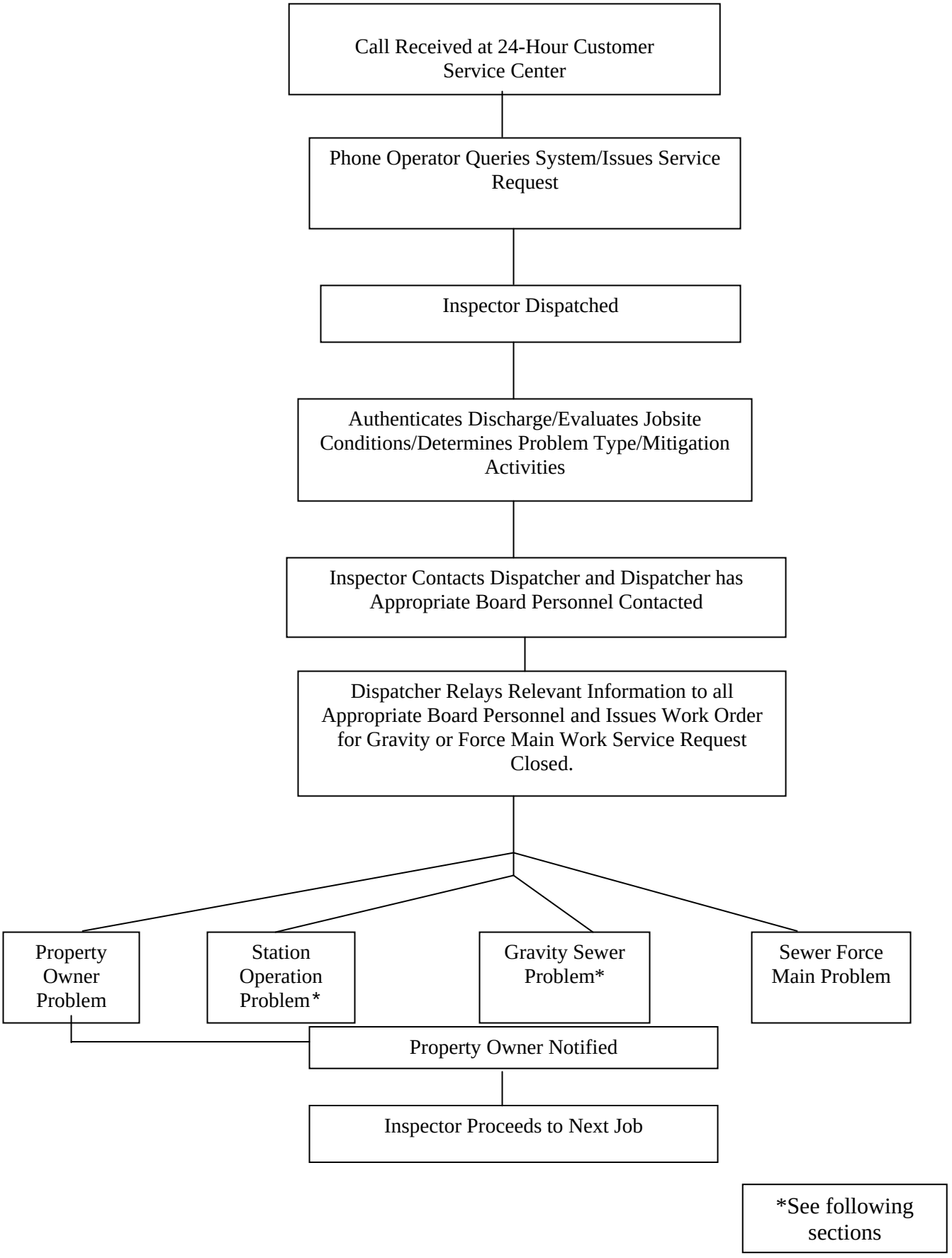
TABLE 2
SERVICE REQUEST PRIORITIES

PRIORITY	DEFINITION
A	Any job that poses an immediate definite threat to life, health or property would be considered an emergency, or Priority A, job. These types of jobs will be handled immediately, with all coordination performed utilizing communication radios, beepers, telephones and computers. All Sanitary Wastewater Overflows are Priority A jobs.
B	Any job that is considered an emergency, but does not pose an immediate definite threat to life, health or property.
C	Any job that should be addressed as a matter of public convenience. These jobs would not be considered a threat to life, health or property.
D	Any job that needs to be addressed first thing the next morning. These "first AM" jobs are normally referrals from late evening teams of jobs that they were unable to complete.

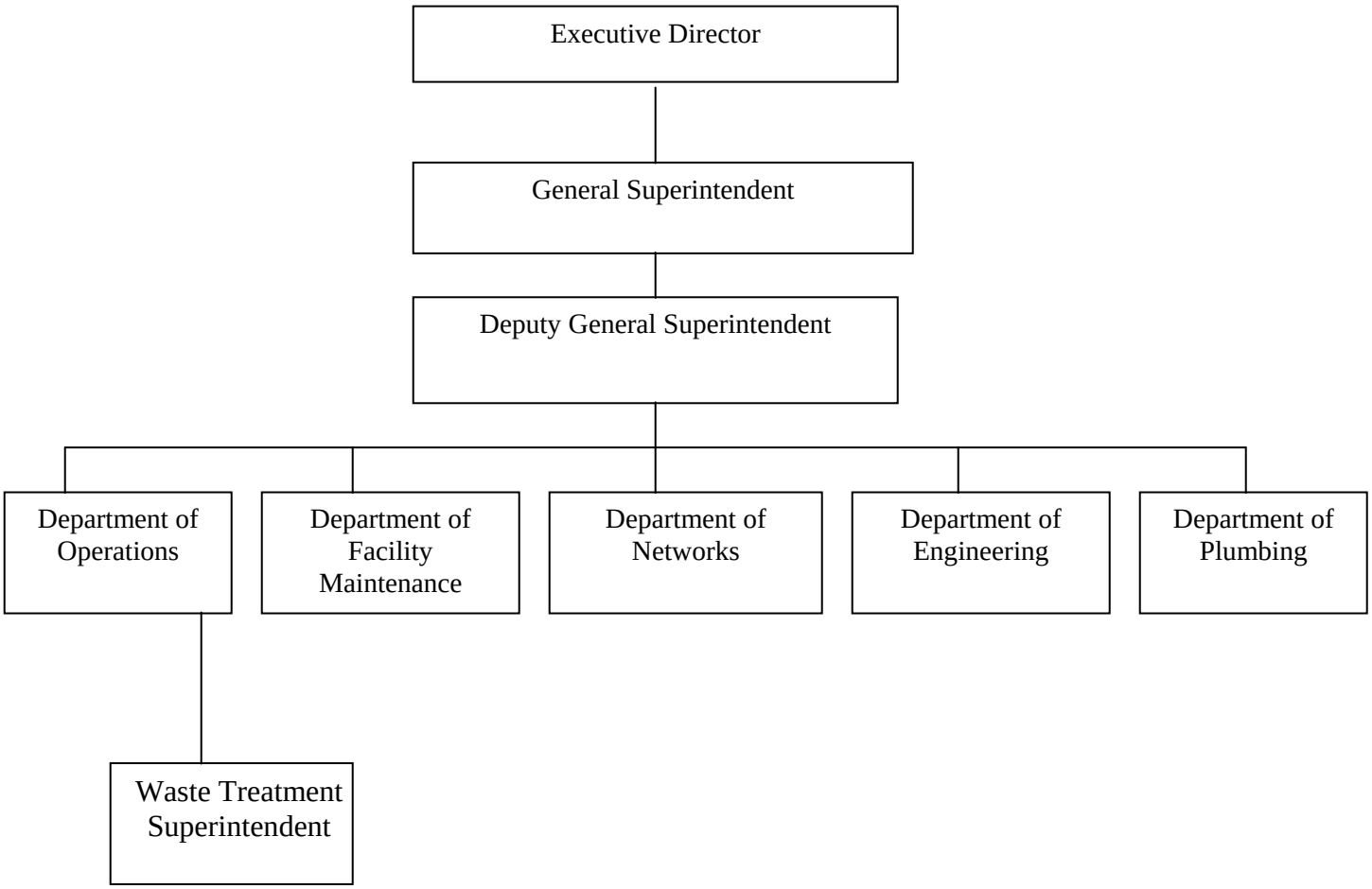
E	Any job that can be addressed whenever a team becomes available. These jobs are held until all Priority A through E jobs have been addressed.

All vehicles that regularly respond to service requests are equipped with two-way radios. Zone Managers are provided with two-way radios as well as cell phones. The office is equipped with a base station for the two-way radio system and that office is staffed with at least one Emergency Dispatcher during normal business hours. After normal business hours, the Zone Manager and/or the Dispatcher who is stationed at the Emergency Desk coordinate the teams. The Board is committed to the precept that all personnel may be made available to mitigate the effects and resolve overflow conditions whenever they may occur.

EMERGENCY RESPONSE FLOW CHART
FIGURE 2-1



GENERAL SUPERINTENDENT'S ORGANIZATIONAL CHART
FIGURE 2-2



2.2.2 - Procedures

1. The 24-Hour Customer Service Center staff receives the call notifying the Board of an emergency. This person then queries the system to determine if the problem is a duplicate. If a complaint was called in previously, staff records the service request information as a duplicate in the Asset and Facility Maintenance system, which is printed to the Dispatch office. The Response Time starts.

2. If necessary, the Dispatcher will look up the sewer house connection records in the Asset and Facility Maintenance System for cleanout information to provide to the Emergency Inspector (Inspector) en route.

3. The Dispatcher assigns the service request to the nearest available Inspector. All Inspector pick-up trucks are equipped with two-way radios. In addition to the radios in the trucks, all-on duty Inspectors are equipped with cell phones in the event they are needed while not in the Board vehicle. If necessary, the Dispatcher provides all of the information available including the sewer house connection records. The Inspector proceeds to the location of the emergency job as quickly and safely as possible.

4. The Inspector arrives on the site of the complaint and collects information regarding the reported emergency. The Response Time is calculated.

5. The Inspector authenticates the discharge report, evaluates jobsite conditions, determines problem type and any mitigation activities. Once on the scene, the Inspector determines if a discharge is occurring, or has occurred. This can be reasonably obtained by checking the problem area for signs of bathroom debris. In the absence of a current discharge, the Inspector would be expected to determine if a discharge condition is imminent. If the discharge condition exists or is imminent, the Inspector examines the job site conditions and attempts to determine the reason for the discharge. Once the discharge has been confirmed, the Inspector determines the type of problem (gravity sewer main or connection choke, sewer force main failure, or property owner problem) and the proper routing to correct the problem. As part of the jobsite evaluations, the Inspector investigates for any mitigating activities available.

6. As a result of the investigation described above, four possible sewage discharge problems will be identified: property owner problem, station operation problem, gravity sewer problem, and sewer force main problem.

7. If the problem is a property owner problem, the owner is directly notified if possible. The Networks department issues a letter advising the property owner of the problem. See Figure 2-3 on page 19. The owner is given thirty (30) days from receipt of the letter to address the problem. If the Plumbing department has not received a plumbing notification in thirty (30) days, they will issue a Final Notice giving the property owner ten (10) days to contact the Board. See Figure 2-4 on page 20. If the property owner still does not contact the Board, water service is discontinued and the Health Department is notified.

8. For any other problem, the Inspector contacts the Dispatcher who has appropriate Board personnel contacted. See respective section for specific personnel. Appropriate Board personnel are equipped with:

    - Two-way communication radios in their pick up trucks, assigned 24 hours per day to assure expeditious response
    - Cell Phones, at a minimum while on duty and in some cases 24 hours a day
    - Portable cellular phones (Division Managers)

- The Dispatcher is provided with a list of home phone numbers for all senior supervisors as well as cell phone numbers.

9. The Dispatcher relays relevant information to all appropriate Board personnel. The appropriate Board personnel are contacted by two-way radio if necessary.

10. The Inspector will contact the complainant and advise them of the job status. If the complainant is not home or does not answer the door, the Inspector will leave a door hanger that describes the results of the inspection and any future actions required by the Board or the property owner. The door hanger also indicates phone numbers that the resident can call to have questions answered.

11. The Dispatcher completes the "Action Taken" portion of the service request and lists the activities performed as well as the results of the investigation. All service request information is entered into the Asset and Facility Maintenance System.

Note: In the event that an experienced Board employee finds a discharge, the report from that knowledgeable source would replace the need for a report from an Inspector. The service request is completed using the information provided by the experienced Board employee. (i.e. Department/Division Head or Supervisor)

It can be reasonably anticipated that the Inspector, upon arrival at the scene, will be required to perform activities working in close proximity to oncoming vehicular traffic. Particular attention should be paid to those sections of the Board Safety Manual relative to this subject. Also, the Inspector must not enter any "confined spaces" as defined in the Safety Manual alone or without proper safety equipment and following proper procedures also as defined therein. See the copy of the Safety Manual (Appendix H) for these and all other pertinent practices and procedures.

NETWORKS DEPARTMENT
PRIVATE PROPERTY OWNER NOTIFICATION SAMPLE
FIGURE 2-3

Re: Water and Sewer Complaints
RJN SR/WO#: _____

Dear Madame/Sir

On _____, SWB Crew #_____ checked the referenced complaints at _____.

Problem details:

(property owner details included here)

Action taken:

(investigation performed by Board noted here)

Problem classified:

The leak is on the property owner side.

As this problem is not the responsibility of the SWB to correct, it is being referred to you as the Property Owner for repair. You are hereby directed to contact a Licensed Master Plumber within thirty (30) days of receipt of this letter to address any Plumbing Code violations. Failure to comply will result in the initiation of enforcement procedures, including fines, penalties, and/or termination of water/sewer service at your location. For any further information, you may contact the Board's Plumbing Department at 504-585-2160.

PLUMBING DEPARTMENT
PRIVATE PROPERTY OWNER FOLLOW-UP NOTIFICATION SAMPLE
FIGURE 2-4

"RE-BUILDING THE CITY'S WATER SYSTEMS FOR THE 21ST CENTURY"

Sewerage & Water Board OF NEW ORLEANS

C. RAY NAGIN, President

625 ST. JOSEPH STREET
NEW ORLEANS, LA 70165 • 504-529-2837 OR 52W-ATER
www.swbnola.org

CERTIFIED MAIL

RE:

Dear Sir or Madam:

The Sewerage and Water Board conducts continuous programs of re-inspections of plumbing installations in order to guarantee the health and safety of the citizens of New Orleans and to prevent contamination of the public water supply. This office has received notice that you were advised by our Networks Department to correct a sewer problem on your property within thirty (30) days .

As of this writing, a plumbing application to correct the plumbing, which is in violation of the Plumbing Code, has not been filed with this office.

This letter, therefore, serves as a **Final Notice** that if a plumbing application is not filed within (10) days from the date of this letter, water service to the above addressed property will be discontinued without further notice.

Should you have any questions concerning this matter, please feel free to contact this office at (504) 585-2160.

Respectfully,

Utilities Services Administrator

2.3 GRAVITY SYSTEMS

2.3.1 - Organization

The Zone Maintenance Teams (Maintenance Teams) are responsible for relieving stoppages or "chokes" from gravity sewers or building service connections. See Appendix A-C for maps of sewer system. Stoppages are caused by obstructions such as roots, grease, debris, broken pipe or a joint failure. These obstructions may require removal, repair, or replacement immediately to correct the problem. Some of the most common types of debris found when removing a stoppage are a build up of solidified grease, detergents, sticks, rags, plastic bags, diapers, broken pipe, brick, rocks, sand, eggshells, and silt.

Stoppages can be cleared and sewers cleaned by either hydraulic or mechanical methods. Hydraulic cleaning methods consist of cleaning a sewer with water under pressure that produces high water velocities. These velocities are usually high enough to wash most grit, grease and debris found in sewers down the sewer and leave the pipe clean.

Mechanical methods of clearing stoppages or sewers consist of using equipment that scrapes, cuts, pulls or pushes the material out of the pipe. Other stoppages are caused by physical obstructions found in the main sewer. These obstructions are sometimes found to be created by plumbers, equipment, or by some force of nature. An obstruction can be caused by the placement of a building sewer tap connection that protrudes into the main sewer, a poorly repaired pipe section, backfill damage to pipe and the misuse of trench compaction equipment, pipe damage due to the improper use of sewer cleaning equipment and other such physical contribution.

Larger items removed from lines and manhole openings which have caused a major problem for removal are broken manhole and flushing inlet casting; concrete and asphalt rubble; large metal and plastic buckets; broken and lost plumber rods, snakes and plugs; wooden posts and timber materials; tree limbs, stumps and many other items.

The Maintenance Teams are centrally located within the City of New Orleans. This division is under the Department of Networks. (See Figure 2-5 on page 23).

The Networks department has established seven maintenance zones within the City of New Orleans. Each zone is comprised of a number of team-based maintenance staff designed to operate as relatively independent business units. These zones are responsible for providing inspection, cost-effective corrective and preventive maintenance of the Networks collection and distributions infrastructure. In addition each zone is expected to assist other zones as well as the Networks support groups to accomplish all assigned zone maintenance responsibilities.

A Technical Services Group has also been established. The service group provides support for Consent Decree compliance, customer service response, maintenance of the Asset and Facility Maintenance System, and contract administration. In addition, concrete/asphalt repairs, shift work, TV inspections and other applicable zone maintenance business practices not assigned to individual zones are supported under this function.

Maintenance Teams typically perform three basic functions: gravity complaints, sewer flushing, and gravity repair to remedy overflowing problems. Gravity complaints are usually remediated by mechanically clearing stoppages.

Sewer flushing generally consists of hydraulically clearing stoppages. High-pressure cleaning vehicles are also available as needed.

Repair is utilized if stoppages cannot be removed by any other means or the sewerage lines are obviously broken or collapsed. Repair Teams will excavate and repair sections of gravity sewers. Additional equipment (back-hoe, dump trucks etc.) is assigned as needed to perform the specific task.

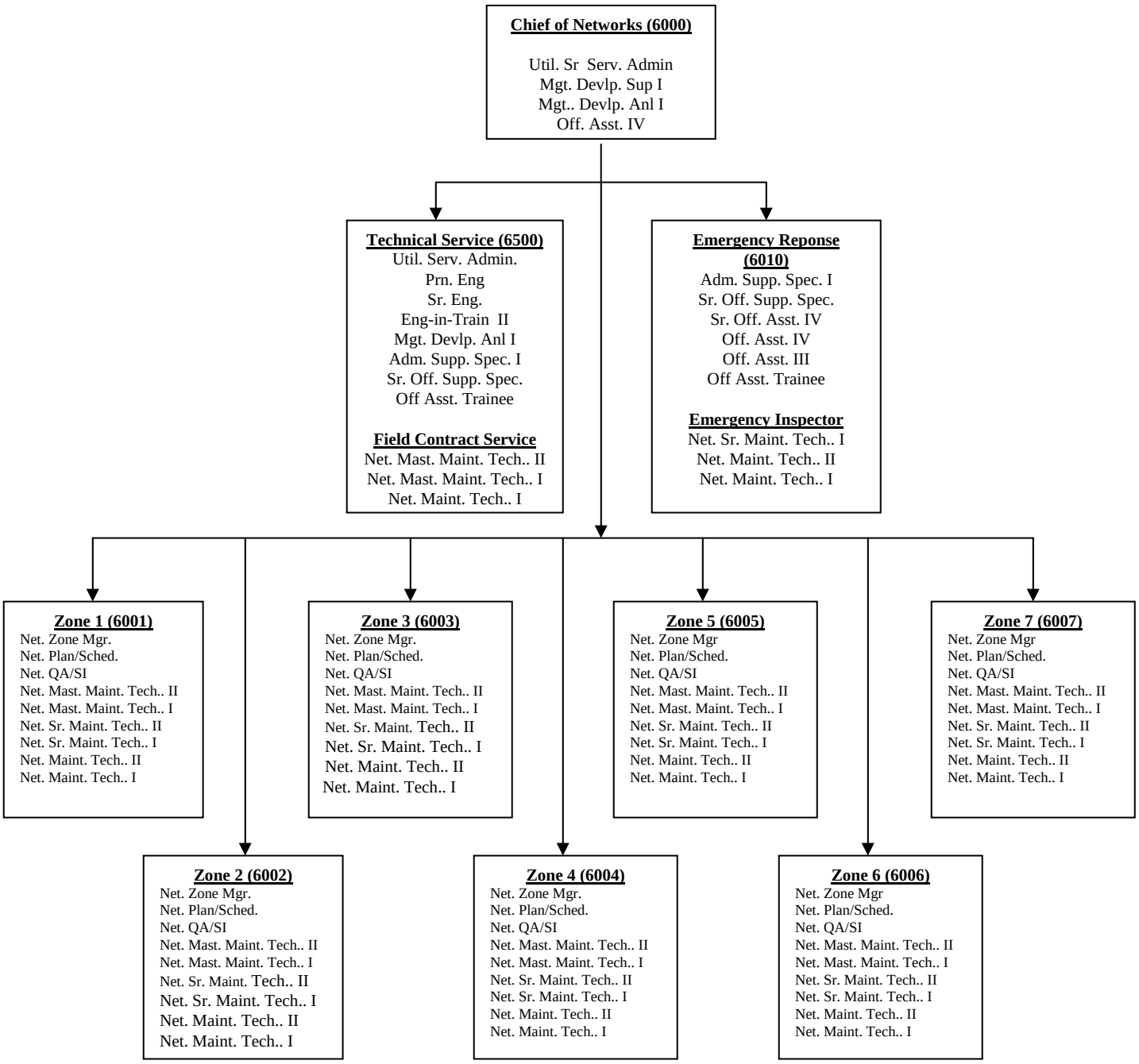
The main objective of Networks is to try to correct the problem as quickly and safely as possible. If the cause of the stoppage can be identified, the best method of correcting it comes next.

A checklist to identify the problem would include:

- Research the line history to identify previous stoppages, root problems or grease problem in the line.
- Check to see if any trees are growing near the line.
- Identify recently installed new building sewers or new lateral or branch sewers
- Determine if any repairs have been recently made to the sewer, other utilities, or to the street.
- Inspect for any ground or surface indications, such as a settlements or sinkholes.

Once the cause of the problem has been identified, the methods for solving the problem can be analyzed.

DIVISION OF NETWORKS
TECHNICAL SERVICES AND SUPPORT
FIGURE 2-5



2.3.2 - Procedures

1. The Manager is contacted by the Dispatcher and provided all relevant information concerning the SSO. For the purposes of this document, all references to the Manager shall be understood to mean Zone Manager, Zone Manager Assistant, Zone Planner/Scheduler, or other designee. In the event that a SSO was reported by a source considered knowledgeable, that report and the information provided would replace the need to dispatch an Inspector to the site.

2. The Manager identifies the closest available Maintenance Team capable of handling the job as described by the Inspector's report, and dispatches them to the scene as quickly as possible. All available information is made available to the Maintenance Team.

3. The Maintenance Team arrives on the scene and unloads the required investigation equipment from the truck, including all Safety Equipment required as outlined in the Sewerage and Water Board Safety Manual.

4. The Maintenance Team determines if there is an active SSO or if there is evidence of a past overflow. In the event of evidence of a past overflow, the Maintenance Team also inspects to determine if an overflow could be considered imminent. The Maintenance Team evaluates the job-site conditions to determine what course of action can be taken to solve the problem. Based upon the collected information, the team identifies what, if any, mitigation activities are available, such as bypass pumping, while the discharge condition is addressed. As a result of the information obtained from these investigations, the Maintenance Team will either confirm or correct the problem type.

5. Property owner problem, gravity problem, force main problem, and station problem are the four possible sewer overflow problem types. The Maintenance Team would be expected to identify which of the above types exist as a result of his/her investigation and proceed accordingly:
    - property owner problem (see step 17 below and Figure 2-6 at the end of Section 2.3.2)
    - sewer house connection or main choke (see step 6 and figures 2-7 at the end of Section 2.3.2)
    - sewer force main broken (see Figure 2-8 at the end of Section 2.5.1), or
    - sewer station outage (see Figure 2-15 at the end of Section 2.5.2.1)

    The Maintenance Team has the option at any time to contact a flushing truck to clean up or mitigate past or active overflow of the sanitary system.

6. The Maintenance Team on the scene concludes that the problem can be solved by the use of high-pressure jets on the choked main or connection. The flusher is positioned downstream of the stoppage and continues upstream until the system is flowing normally. The Maintenance Team will retain if possible, the nature of the blockage (grease, dirt, broken pipe, roots, etc.) and indicate nature when filling out the work order.

7. The Maintenance Team will determine if the efforts to break apart the obstruction have been successful and the obstruction is eliminated.

8. If the choke is not broken by the Maintenance Team, a Manager or designee is contacted for assistance. Based upon various factors such as the type of obstruction, the years of experience the Manager or designee has with unstopping the sewer system, and Maintenance Team availability, the Manager will make a recommendation for either a repair truck or a larger flushing truck. Generally, jobs will be referred for flushing for a grease or grit choke and for a Repair Team for chokes caused by broken pipe. If the determination is made to refer for Repair

Team, go to step 12.

9. The Maintenance Team utilizes the two-way radio to have a Flushing Team dispatched to the emergency repair site. The next available flushing truck is routed to the jobsite.

10. The Flushing Team arrives on the site and establishes a safe working environment in accordance with the Sewerage and Water Board Safety Manual. Utilizing the information supplied to the Flushing Team and an examination of the jobsite, the supervisor will direct the team to dislodge and collect the obstructive material from the pipe utilizing either a flushing or vacuum truck. The time required for this procedure will vary significantly depending on size of pipe, length of pipe (main vs. connection), and the amount of debris.

11. If flushing is successful and the obstructive material is dislodged and debris is removed go to step 16. If Flushing Team is unsuccessful, a Repair Team will be required and containment procedures are initiated.

12. A Manager is contacted by the two-way radio and collects all relevant information concerning the unauthorized discharge. The Dispatcher is also notified of the emergency excavation and is directed to contact other utilities so that their lines can be marked prior to emergency excavation in accordance with State Law.

13. The closest available pipe repair truck is identified and routed to the emergency repair job.

14. The Repair Team arrives on the scene and establishes a safe working environment in accordance with the Sewerage and Water Board Safety Manual.

15. Before the Repair Team begins pipe excavation to repair or replace the blocked section, all utilities must be located in accordance with State Law. Observe all traffic control and safety precautions. Personal safety equipment such as hard hats, safety glasses, steel toe boots, etc. must be worn by the team. After the location of the obstruction has been laid out where possible, a backhoe is used to excavate a trench. The backhoe operator must be careful to avoid damaging any underground utilities. The backhoe can be used only to point where team with shovels must expose the pipe. Once the pipe is exposed and the defect located, the appropriate repairs are made. This could include splicing in a new piece of pipe or replacing an entire pipe segment. The Repair Team must backfill the trench appropriately and if any transfer is required, it is performed sewer to sewer.

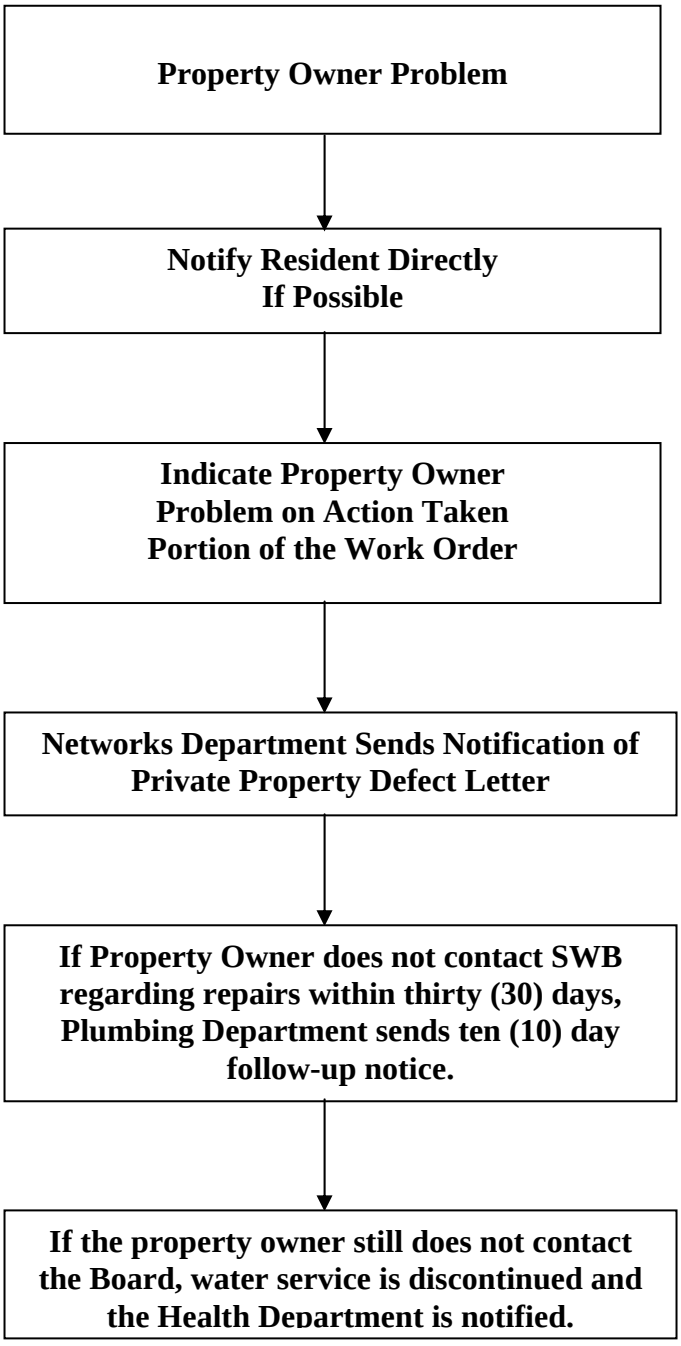
16. The Repair Team removes all construction debris and cleans the area affected by discharge. Clean up of the discharge will include an attempt to collect all discharged flow and material possible and return it to the sanitary system using pumps. In the event that a large amount of flow needs to be collected a vacuum truck could be dispatched to that location. Disinfect the site after final cleanup.

17. The Repair Team will notify the complainant directly if possible. The Networks department issues a letter advising the property owner of the problem. See Figure 2-3 in Section 2.2.2. The owner is given thirty (30) days from receipt of the letter to address the problem. If the Plumbing department has not received a plumbing notification in thirty (30) days, they will issue a Final Notice giving the property owner ten (10) days to contact the Board. See Figure 2-4 in Section 2.2.2. If the property owner still does not contact the Board, water service is discontinued and the Health Department is notified.

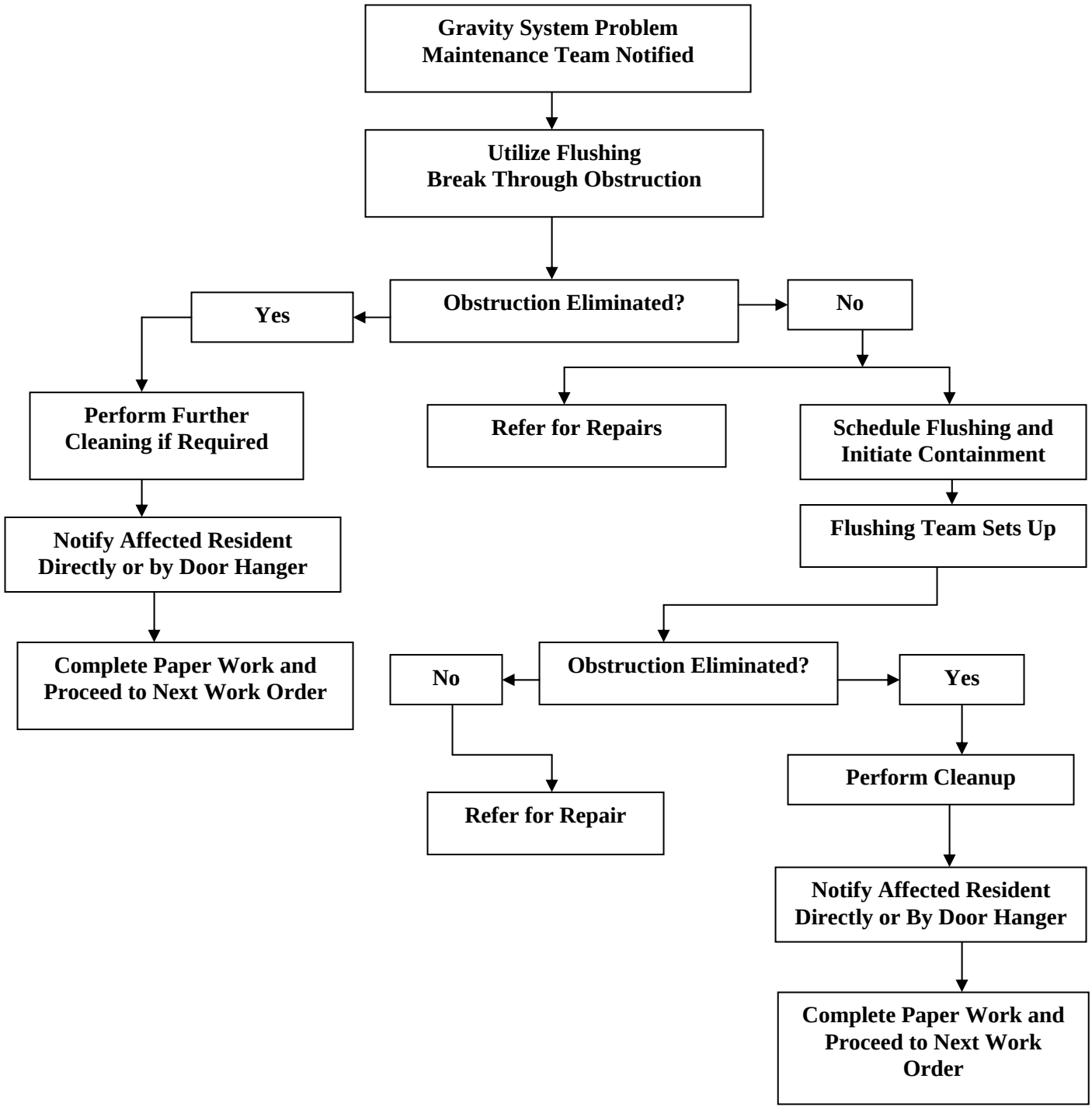
18. The Repair Team completes the “Action Taken” portion of the work order and lists the activities performed as well as the results of the investigation. If any additional Board work is required, the work order would indicate the work to be performed and the proper department to refer the subsequent work order. Once the paperwork is complete, the Repair Team would contact the dispatcher or the Manager and proceed to the next job. All work order information would be reviewed by the Manager and sent for entry into the computer database upon return to the Office.

    Work orders that investigation indicated as property owner problems are photocopied prior to submission for data entry. The photocopy is sent to the Technical Services Group and a form letter is sent to the property owner describing the problem found. A phone number is listed on the letter in the event the property owner has additional questions concerning the job. The Plumbing department receives a copy of this letter.

GRAVITY SYSTEM EMERGENCY RESPONSE FLOW CHART
PROPERTY OWNER PROBLEM
FIGURE 2-6



GRAVITY SYSTEM EMERGENCY RESPONSE FLOW CHART
FIGURE 2-7



2.4 PRESSURE SYSTEMS

2.4.1 - Organization

The Repair Teams are responsible for repairing all force main pipe and valving. See Appendix D for a map of Major Sewer Mains.

Force mains can be damaged by breakage, which may result in serious spills requiring isolation of the force main segment to enable repairs. In some cases, numerous pump stations are affected when a force main segment is taken out of service. The isolation of a damaged force main segment for repairs and the rerouting of normal sewage flow requires shutdown of affected pump stations and the closing and opening of key valves at pump stations and on the force main segment to be isolated.

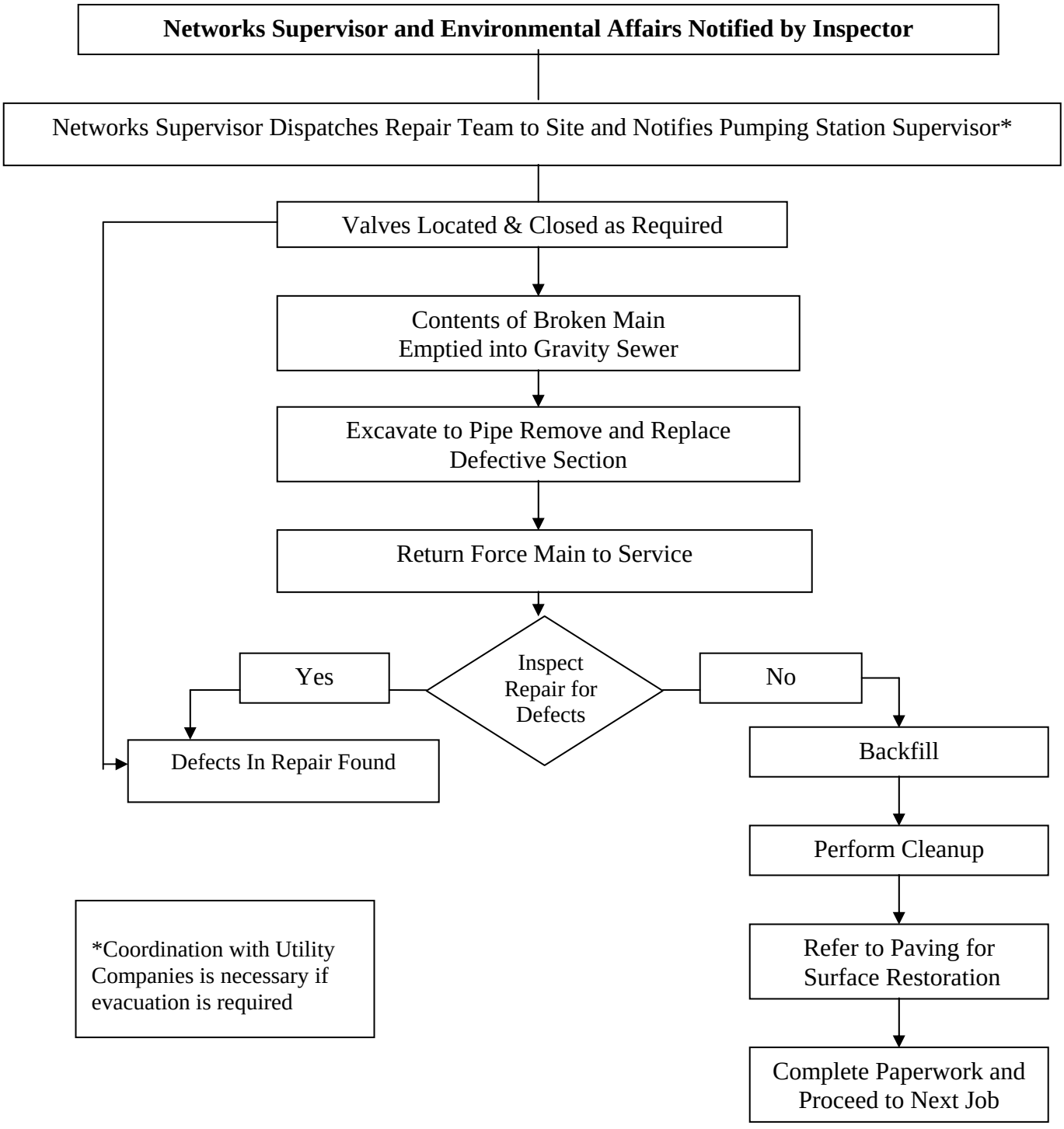
This scenario dictates extremely careful planning of force main segment isolation procedures, affected pump station shutdown procedures, sewage overflow containment, and expeditious repair of the force main. Thorough communication and coordination among key personnel of the Board is essential.

Team sizes and equipment for pressure system repairs vary according to the size and complexity of the repair. Generally speaking, teams can be classified as “standard repair and maintenance teams” and “large repair teams.” A standard repair team typically consists of a five-person team under a supervisor. Large teams are assigned based upon the complexity and size of the assignment.

Teams are available to respond to emergency situations 24hrs/day 7days/week. See Figure 2-5 (Networks Organization Chart) at the end of Section 2.3.1.

Since a force main failure has a significant potential for adverse environmental impact, all necessary resources are immediately made available for remediation of this type of event. If needed, the Networks, Sewerage Pumping, and Environmental Affairs departments will assist on site in the planning of an immediate proactive response. In addition to the potential for an adverse environmental impact, this type of repair activity has the potential to affect and require the communication with and coordination and participation of every Department associated with the sewerage system, including the wastewater treatment facility. Figure 2-8, on page 30, identifies the sequence of activities taken for force main repair.

PRESSURE SYSTEM EMERGENCY RESPONSE FLOW CHART
FIGURE 2-8



2.4.2 - Sewer Force Main Repair Procedures

1. The Zone Manager (Manager) is notified by the Dispatcher. Also notified are the Environmental Affairs department, the General Superintendent's office, the Chief of Networks, the Principal Engineers, and Pumping Operations. The Event Time starts.

2. The Manager assigns a Maintenance Team that is dispatched to the site. At that time, a call is made for a utility mark-off prior to any excavation. All safety procedures and equipment identified in the Board's Safety Manual must be followed and utilized.

3. The Maintenance Team checks inventories including checking to assure that pumps larger than 3" are available to ensure that necessary materials and spare parts are available to make the repairs, as well as necessary drawings that identify force main piping and valves (including locations and sizes). See Appendix D for Major Sewer Main layout map. The event Response Time stops when the Maintenance Team arrives. Set up containment where possible.

4. The Maintenance Team shall carefully return wherever possible the contents of the force main back to the sewerage system. In many cases, the force main is returned to a gravity sewer. If this cannot be done, an alternate plan for containment must be developed in cooperation with the Drainage and Sewerage Pumping Supervisor. See Section 4 - SANITARY SEWER OVERFLOW CONTAINMENT PLANNING.

5. The Manager is to contact the Drainage and Sewerage Pumping Supervisor to advise of the need to shutdown all stations that pump into the section of the force main that needs to be isolated. (See Section 2.5.2). Wet wells may be pumped down in advance of shutdown to provide additional system storage.

6. After the Pumping Supervisor has verified the station(s) have been shutdown, the Manager coordinates the closing of all the valves necessary for isolating the force main affected by the defective section and draining the pipe.

7. After all the procedures have been carefully followed to isolate the force main segment, repairs can be made by the Maintenance Team.

8. Make sure that all underground and overhead utilities that may be affected by the repair have been marked prior to beginning work.

9. Remove, replace or repair defective segment. Test repairs prior to backfilling.

10. Return force main to service. Once a force main break has been repaired and is ready for service, the procedures taken to isolate the force main segment must be followed in reverse to restore normal operation of the pump stations, force main, and any valves affected by the shutdown.

11. Clean up work site. Remove any and all construction debris and cleanse area affected by discharge. Clean up of the discharge will include an attempt to collect all discharge flow and material possible and return it to the sanitary system. In the event that a large amount of flow needs to be collected, a flushing or vacuum truck could be dispatched to that location. Disinfect the area.

12. The Maintenance Team completes the "Action Taken" portion of the work order and lists the

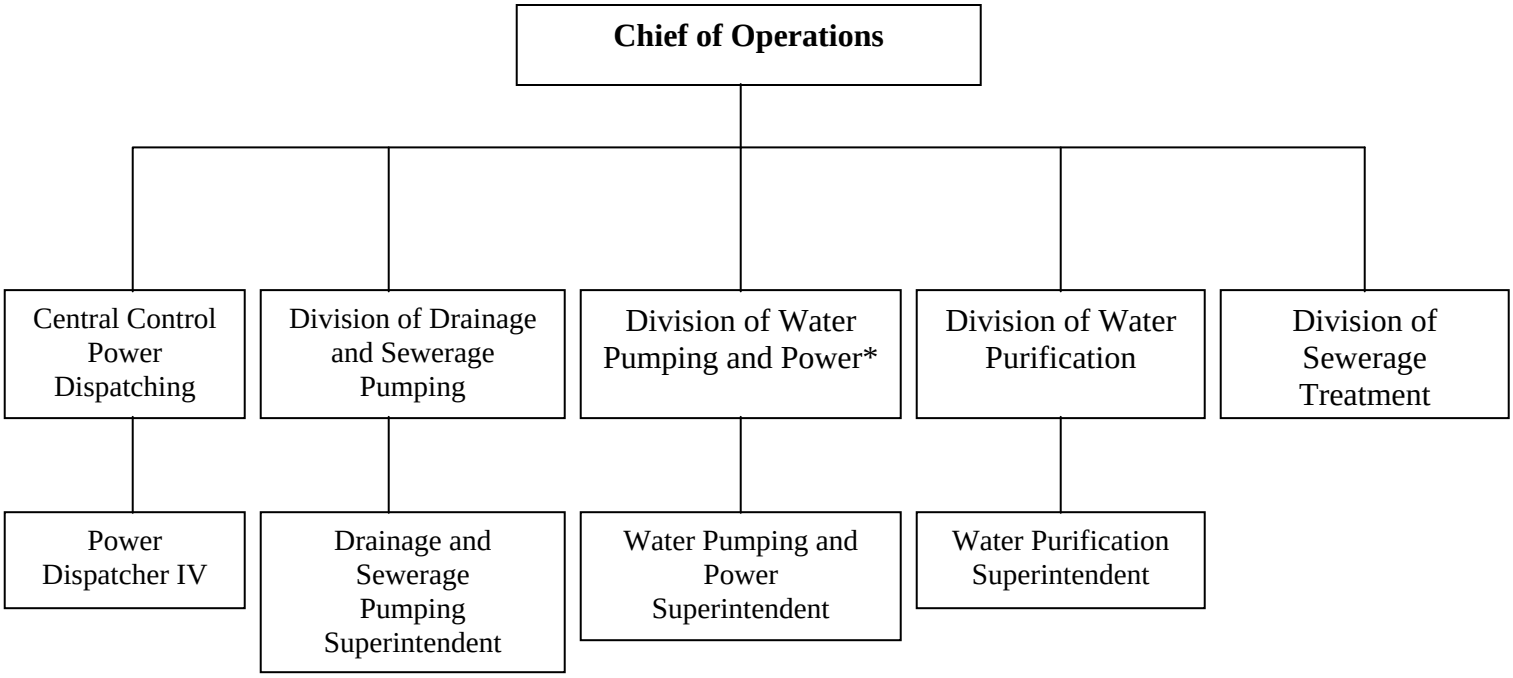
activities performed as well as the results of the investigation. If any additional Board work is required, the work order would indicate the work to be performed and the proper department to refer the subsequent work order. Once the paperwork is complete, the Maintenance Team contacts the Dispatcher or the Manager and proceeds to the next job. All work order information is reviewed by the Manager or his designee and then sent for entry into the computer database. The report to the Environmental Affairs Department is prepared at this time.

2.5 LIFT AND PUMP STATIONS

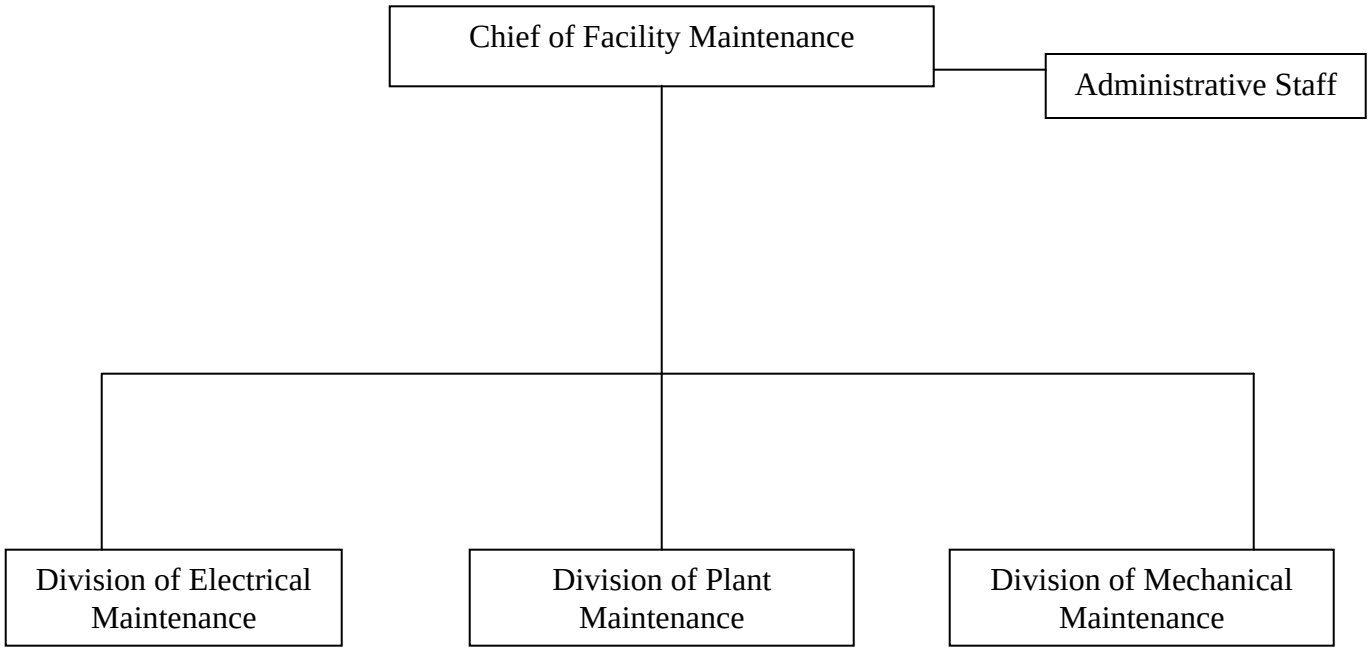
2.5.1 - Organization

The Department of Operations and Department of Facility Maintenance under the General Superintendent, operate and maintain the sewage lift and pump stations. The Division of Facility Maintenance is responsible for major electrical and mechanical maintenance. Figures 2-9 (page 33) and 2-10 (page 34) depict the organizational structure within the departments. A map of the lift and pump stations is located in Appendix E. These stations can be grouped by physical similarities. The following pages include details on grouping for the East Bank sewerage pumping stations. Each pump station has at least two automated pumps. One pump is set to respond to normal wet well levels and is called the “lead” pump. The other pump(s) is/are set to respond to higher wet well levels, in a “lag pump” role to maintain the station’s pumping capacity in the event of lead pump failure or excessive effluent to the wet well. The “lead/lag” designations are switched regularly to equalize pump wear.

DEPARTMENT OF OPERATIONS
FIGURE 2-9



DEPARTMENT OF FACILITY MAINTENANCE
FIGURE 2-10



2.5.1.1 - Sewerage Operations Department

The East Bank is divided into 6 routes, each with nine (9) to twelve (12) lift and/or pumping stations. Division staffing is identified in Figure 2-11 at the end of Section 2.5.1.1. Each route has staff assigned to operate and maintain the stations.

Stations "A" and "D" are provided 24 hour per day coverage by Sewerage Operations. Station "C" is staffed 24 hours per day by the Division of Water Pumping and Power, see Figure 2-12 at the end of Section 2.5.1.1. The other sewerage lift and pump stations are operated automatically. For monitoring these automatic stations, personnel in Sewerage Operations work from 7:00 A.M. to 3:30 P.M., Monday through Friday. An attempt is always made to assure that at least two employees service unscheduled outages. Emergency On-Call coverage is provided by the Operations and Facility Maintenance Departments on all off hours. In addition, to further assure expeditious response to a potential if not an actual emergency, all supervisors are assigned cell phones and vehicles for their commute to and from work and for use while at work. These vehicles are equipped with two-way radios, tools, and safety equipment.

The Drainage and Sewerage Superintendent, the Drainage and Sewerage Supervisor, and the Sewerage Pumping Station Supervisors, are always On-Call, except for vacations, leaves of absence, and illness, during which time they will provide coverage for each other. An On-Call personnel list is prepared to provide coverage as follows:

Sewerage Operation - East Bank
- Assistant Supervisors for all routes and Station "A"
- Back up Assistant Supervisors for all routes and Station "A"

Drainage and Sewerage Operation - West Bank
- Assistant Supervisor for all West Bank Stations

EASTBANK S.P.S LISTING AND ADDRESSES (Grouped by physical similarities)

FACILITY NAME	***LOCATION***
Manned pumping station	
S.P.S. "A" (sewerage only)	1321 Orleans Ave.
D.P.S. "D" (drain. & sew.)	2801 Florida Ave.
Lift Stations below ground, cast in place	
S.P.S. 1	7336 Cohn at Lowerline
Pumps to gravity system for S.P.S. 14	
S.P.S. 3	8720 Olive near Eagle
Pumps to gravity system for S.P.S. 5	
S.P.S. 6	242 S. Solomon at Palmyra
Pumps to gravity system for S.P.S. 15	
S.P.S. 8	Broad at Toulouse
Pumps to gravity system for S.P.S. "A"	
Pumping stations electrical equipment above ground, pumps below street level - use oil drips for bearing lubrication	
S.P.S. "B"	4725 St. Claude at Jourdan

S.P.S. 14	4000 Clara at Marengo
2 units pump into gravity main to S.P.S. "A"	
2 units pump into force main to S.P.S. "A"	
S.P.S. 15	2431 Palmyra near S. Rocheblave
2 units for force main, 2 units for gravity main (cannot use all 4 pumps together)	
S.P.S. 16	3751 N. Miro at Pauline
Pumps to gravity system to S.P.S. "B"	
S.P.S. 17	4975 Spain at Selma
Pumps into gravity system to D.P.S. "D"	
S.P.S. 18	Vicksburg at Florida
S.P.S. 19	3730 Jumonville at Milton
S.P.S. 21	6670 Memphis at Filmore
S.P.S. 22	5705 Perlita near Prentiss
S.P.S. 23	4500 Mithra

Different physical structure - bearings use grease

S.P.S. 5	1302 Erato at S. Dorgenois
S.P.S. 9	2540 Annette at Law

Different physical structure - bearings use grease

AMID S.P.S.	6800 Almonaster
Eastover S.P.S.	6051 Eastover Dr.
Industrial Pkwy. S.P.S.	4200 Industrial Parkway off Chef
Oak Island S.P.S.	14201 Michoud
Paris Road	12001 Dwyer Rd.

Pumping station electrical equipment above ground, pumps just below street level - use vacuum system to draw water to pumps

S.P.S. 4	5899 Fleur De Lis
S.P.S. 20	328 37th Street
S.P.S. 24	5027 N. Tonti near Reynes
S.P.S. 25	2245 Charbonnet at N. Tonti
S.P.S. 26	2244 St. Maurice at N. Tonti
America S.P.S.	6789 Dwyer at Westlake
Castle Manor S.P.S.	4950 Gwain at Dwyer
Cerise S.P.S.	5001 Cerise at Dwyer
Chickasaw S.P.S.	Chickasaw at Metropolitan
Gentilly Oaks S.P.S.	5000 Papania at Vienna
Lakeland Terrace S.P.S.	5057 Warren Dwyer
Pines Village S.P.S.	155 Dwyer at Foch
Wilson S.P.S.	7709 Wilson at Dwyer

Pumping stations below ground - poured in place

Berg S.P.S.	11501 Morrison
Burke S.P.S.	9001 Morrison at Burke
Briarwood S.P.S.	13701 Morrison near Briarwood
Bullard S.P.S.	5501 Bullard (next to bowling alley)
Crowder S.P.S.	5500 block of Crowder (in front of bank)
Dodt S.P.S.	8118 Chef Hwy
K-Mart S.P.S.	Desire at Gentilly
Lake Forest S.P.S.	10451 Lake Forest near Read

Lakewood South S.P.S.	Country Club Dr. near Marcia
Lawrence S.P.S.	7901 Morrison west of Crowder
Liggett S.P.S.	12501 Morrison near Dune
Shorewood S.P.S	14441 Morrison at Shorewood
Victoria S.P.S.	Victoria at Gentilly
Weber S.P.S.	10141 Morrison near Read

Lift station below ground - poured in place

Plum Orchard S.P.S.	7300 Chef Hwy. (inside apt. complex)

Pumps to gravity system for Dodt S.P.S.

Pre-fab metal can stations

American Marine S.P.S.	4045 Jourdan Rd.
Folger's S.P.S.	14601 Gentilly
France & Florida S.P.S.	2701 France Rd. at Florida
Lamb S.P.S.	6450 Morrison by Kenilworth
MeCo S.P.S.	3855 France by Mech. Equip. Co.

Pumps to gravity system for France & Florida S.P.S.

Michoud S.P.S.	4400 Michoud south of R.R. tracks
Southern Scrap S.P.S.	Southern Scrap Rd.
Vent. Isles S.P.S. #2	0711 Old Spanish Trail

Pumps to gravity system for Industrial Park S.P.S.

Village De Lest S.P.S.	11324 Dwyer off Michoud

Lift station - pumps and motors in wet well

McCoy S.P.S.	McCoy at Gentilly

Pumps to gravity system for Dodt S.P.S.

Pre-fab above ground stations - fiberglass huts

Wright Rd.	Wright Rd. at Lake Forest

Pumps to gravity system for Lake Forest S.P.S.

Willowbrook S.P.S.	Willowbrook off Michoud

Pumps to gravity system for Village de Lest S.P.S.

Station above ground built over wet well, pumps submerged in water

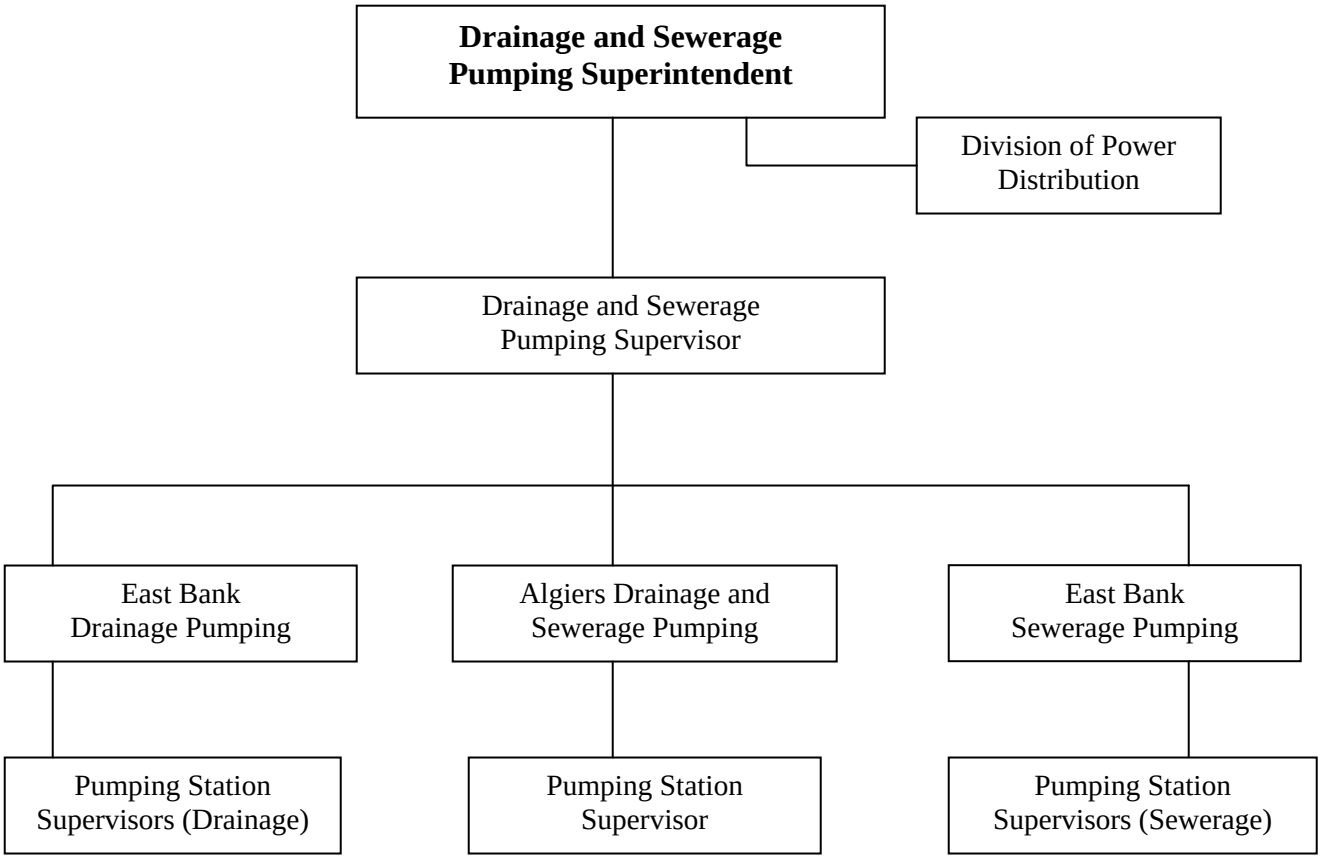
Blvd. "X" S.P.S.	14433 Chef Hwy.

Poured concrete station - equipment just below street level (similar in design to Wright & Willowbrook)

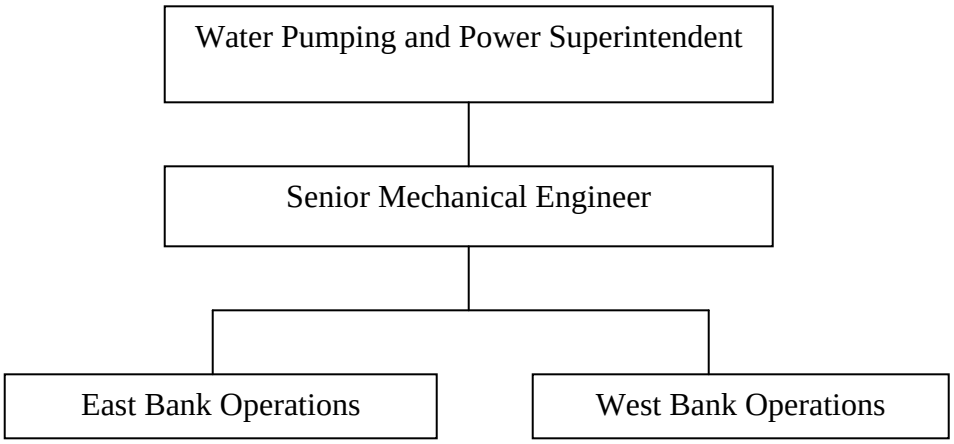
Alcee Fortier S.P.S.	Alcee Fortier Blvd. at Levee

Pumps to gravity system for Blvd. "X"

DIVISION OF DRAINAGE AND SEWERAGE PUMPING
FIGURE 2-11



DIVISION OF WATER PUMPING AND POWER
FIGURE 2-12



2.5.1.2 Facility Maintenance Department

The Division of Mechanical Maintenance and the Division of Electrical Maintenance are responsible for the maintenance of the pumping stations. Refer to Figures 2-13 and 2-14. (The Division of Plant Maintenance does however assist in an emergency). The Chief of Facility Maintenance, the Mechanical Maintenance Superintendent, and the Electrical Maintenance Superintendent are always On-Call except for vacations, leaves of absence, and illness, during which time they will provide coverage for each other. Each week, an On-Call list is prepared for the next week, providing coverage as following:

Machine Shop On-Call
- Mechanical
- Welding
- Diesel

Machine Shop Back-Up
- Mechanical
- Welding
- Diesel

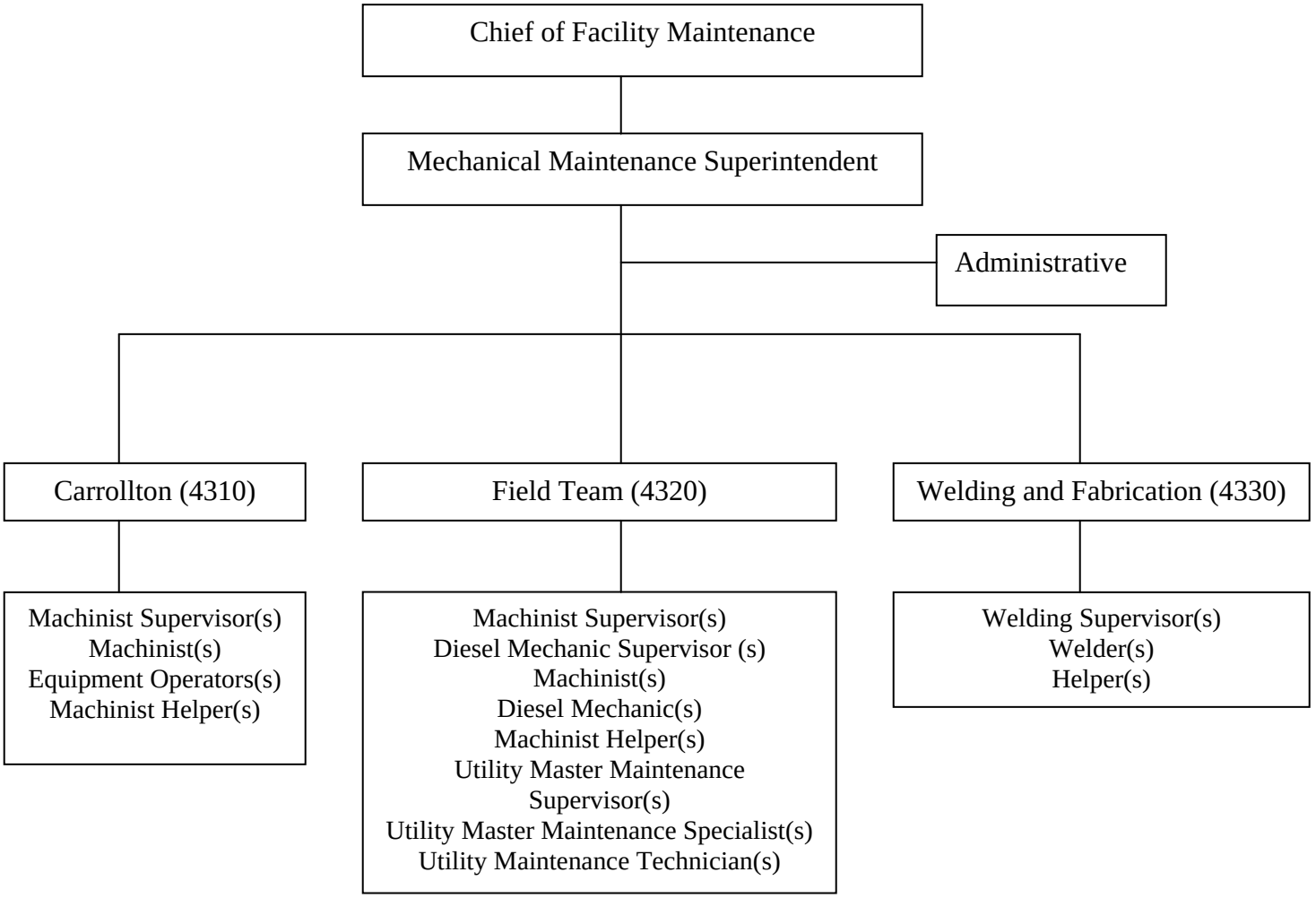
Electrical Shop On-Call
- Duty Supervisor
- Electricians
- Pole Line
- Instrumentation Technician

Electrical Shop Back-Up
- Duty Supervisor
- Electricians
- Pole Line
- Instrumentation Technician

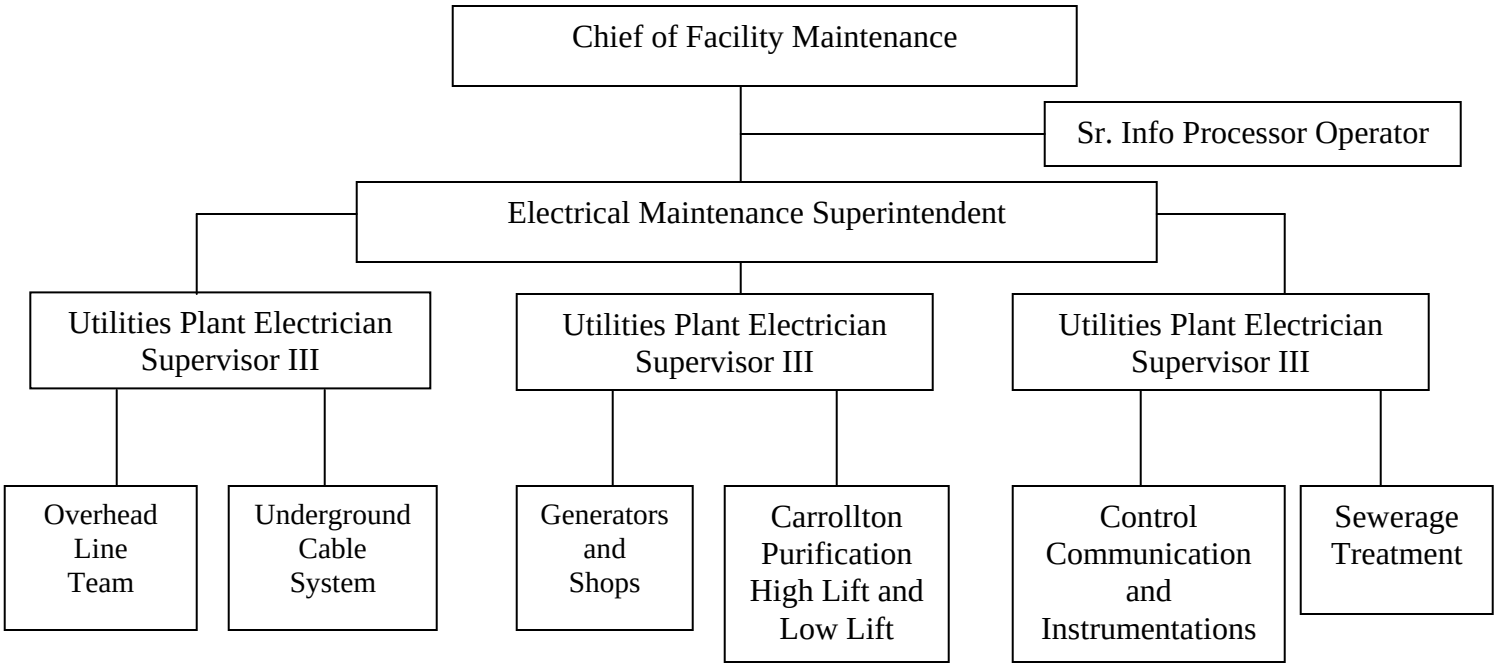
When there is a pending rain storm, the Board Power Dispatchers will call in personnel from the electric shop, as noted on their On-Call list, under "rain load". This person(s), depending upon need, works solely within the power generation complex to assure that the electrical problems within the 25 Hz Power Generation Plant are immediately addressed.

Note: Personal On-Call take home vehicles stocked with sufficient tools, supplies and materials to effect basic repairs.

MECHANICAL MAINTENANCE DIVISION
FIGURE 2-13



ELECTRICAL MAINTENANCE DIVISION
FIGURE 2-14



2.5.2 PROCEDURES

2.5.2.1 - Pump Station Unscheduled Maintenance Work Flow Chart (see Figure 2-15 on page 44)

Notification of a problem may be received from a customer complaint to the phone center or directly either from Board forces or from monitoring of the SCADA system. (When notice is from a customer complaint, normal procedures are followed. The Emergency Inspector who investigates or the duty supervisor then notifies either SPA "A", DPS #13, or the on-call person.) SPS "A", DPS #13 or the on-call person will dispatch the appropriate route team or route supervisor to the station handling the area of the complaint.

The on-duty operator at S.P.S. "A" (or D.P.S. #13) records the information regarding the nature of the complaint on the "Sewerage Pumping Operations Complaint Report". A notation of the complaint call being received is also made in the station logbook at S.P.S. "A" (or D.P.S. #13).

The route team or supervisor makes a field investigation to determine if the problem is due to a station outage.

If the problem is not due to a station outage, S.P.S. "A" (or D.P.S. #13) is notified of same. S.P.S. "A" (or D.P.S. #13) will then contact the department that called in the complaint and inform them that the station is operating properly and complete the "Complaint Report", as well as making a notation in S.P.S. "A"'s log book.

If the route team or route supervisor determines that there is a station outage which the Department of Operations personnel cannot correct, S.P.S. "A" (or D.P.S. #13) is notified and requested to contact the departmental supervisor to apprise him of the situation. The departmental supervisor will take the necessary action to contact the appropriate department that is needed to get the station back in service. (If the nature of the outage is due to loss of service from the electric utility company, the utility company will be contacted by S.P.S. "A" (or D.P.S. #13), and is noted in the station log book.)

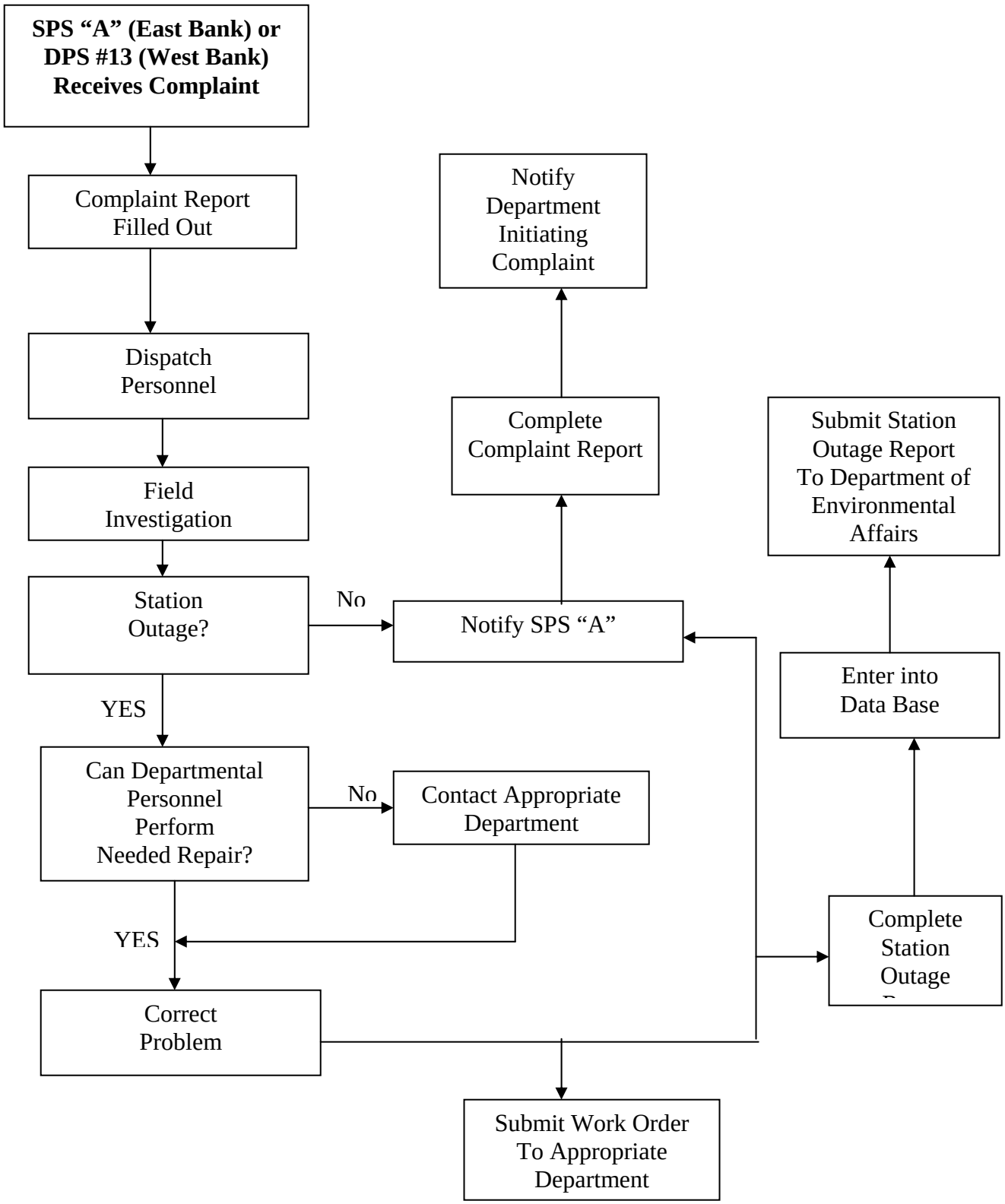
Required service or maintenance is performed to get the station back in service. S.P.S. "A" (or D.P.S. #13) is notified of the nature of the problem and steps taken to correct same. The route team or supervisor dispatched to the scene is responsible for filling out an "OUTAGE REPORT AUTOMATIC SEWAGE PUMPING STATION" form.

If a division of the Facilities Maintenance Department was needed to get the station back in service, the route supervisor or departmental supervisor will submit a work order for the completed work that was performed.

The information from the "OUTAGE REPORT AUTOMATIC SEWAGE PUMPING STATION" form is entered into the station outage database at the Sewerage Pumping Operations office and a "Drainage/Sewerage Operations Department Station Outage Report" is then generated and submitted to the Department of Environmental Affairs.
A flow chart for addressing station operation problems, as noted above, is found in Figure 2-18.

Historical records have shown that the response time (i.e., time that the Department of Operations receives a complaint from S.P.S. “A” to the time that such complaint is adequately addressed) is approximately thirty (30) minutes. Furthermore, approximately 95% of all complaints received by the Department of Operations are successfully addressed within the Department of Operations.

OPERATIONS DEPARTMENT
UNSCHEDULED MAINTENANCE WORK FLOW CHART
FIGURE 2-15



2.5.2.2 - Employee Training Manual - Department of Operations

Proper training is essential to assure that personnel can successfully address routine and emergency problems at the lifting and pumping stations, which otherwise could result in unauthorized discharges. To this end, an in-depth Employee Training Manual (Appendix G) was written in 1970 by and for Drainage and Sewerage Pumping Operations. This manual, revised in 1995, is structured to take a newly hired employee one year to complete in order to be eligible for advancement to an Operator position. In addition, this training program is designed as a (refresher) course for current Operators, supervisor assistants and supervisors, all of whom are required to attend a minimum of twenty hours of classroom training every two years. Also, all Operators and Supervisors possess State Certification for wastewater collection.

2.5.2.3 - On-The-Job and Classroom Training - Department of Facility Maintenance

In the Department of Facility Maintenance, typically semi-experienced or experienced trade groups (i.e., electricians, welders and mechanics) are hired. Semi-experienced personnel typically have trade certificates from schools and enough knowledge to pass a performance test. Such semi-experienced personnel are hired as entry-level electricians, welders and mechanics and, after one year from their date of hire, are eligible to be promoted to Utility Plant Electricians, Welders, and Mechanics after the successfully passing performance testing. Personnel with sufficient outside experience can be hired directly as Utility Plant Electricians, Welders, and Mechanics, again only after successfully passing performance testing.

In addition to on-the-job training, personnel in the Department of Facility Maintenance attend on-site and off-site training seminars and programs, to be better able to address scheduled as well as unscheduled repairs. Based upon performance, all maintenance employees are eligible for the Supervisor I, II, and III positions.

2.5.2.4 - Safety Program

Consistent with the necessity to adequately address scheduled and unscheduled maintenance at the sewerage lift and pump stations, the Sewerage and Water Board is committed to providing a safe and healthy work environment for its employees. To this end, the Safety Department has developed general guidelines and policies geared to providing and maintaining safe and healthy working conditions and safe operating practices - refer to the attached Safety Manual (Appendix H).

2.5.2.5.1 - Miscellaneous Relevant Procedures

2.5.2.5.1.1 – Routine Routine Work Schedule Automatic Sewer Stations

This work schedule is a guide to the work that must be performed on each of the routes. It is NOT all-inclusive. There will be other duties that must be performed that are not included on this schedule. All employees are reminded that the route operator is the immediate supervisor, and is responsible for getting the work done on the route. If you are not the route operator, you are to comply with the directives and work assignments as given by the operator.

All personnel are expected to be at their assigned route truck and ready to leave Station "D" by 7:15 AM. The operator should not have to seek the whereabouts of the helpers assigned to him/her.

Both the operator and the assigned helper are to enter any and all stations that are being checked, or where work is being done. Helpers found sitting in the truck while the operator is in the station will receive disciplinary action in a manner similar to the attendance policy.

During the course of the workday, unless you have an emergency that has been approved by a Supervisor or Supervisor Assistant, do not ask to:

- Stop home or anywhere else
- Go off the route
- Take care of personal business
- Use the telephone (except at lunch time)
- Study non-SWB approved class material (except at lunch)
- Sleep in the truck
- Smoke in the truck

All employees are expected to:

- Properly wear and buckle their seat belts when riding in SWB vehicles.
- Have all personal equipment that may be needed for performing work, including boots, rain gear, and safety gear. Everyone is reminded that they are personally responsible for any equipment charged to their inventory. Items lost are to be reported immediately and must be paid for.

Helpers are required to take an active part in their training by assisting in any and all work being performed and by asking questions concerning operation and maintenance procedures of the stations.

Operators are expected to take an active part in training their helpers by seeing that their helpers assist in performing any and all work being performed, and asking questions of the helper pertaining to operation and maintenance procedures. All stations on the route are to be inspected on Monday, Wednesday and Friday. In the event of holidays and/or bad weather, these days may be changed. During your inspection on route days, you are to tend to any maintenance that requires immediate attention and make your plans as to any routine maintenance to be performed on "maintenance" days (usually Tuesday and Thursday).

Daily Work

Operator: Before leaving Station "D" check oil and gas in truck and for lawn equipment (you are responsible for mixing gas). All are to be fueled up either before you go out on your route, or in the afternoon when you are returning from your route. Likewise for supplies and/or equipment from the yard or Station "D". You are not to return to the yard or Station "D" during the day unless it is an emergency and your route supervisor has authorized your return.

Helper: Follow directives of your operator, such as getting ice, supplies, loading tools and/or equipment onto truck, etc.

At Each Station:
Helper: Check all bearings; bearings should be checked for the proper oil level, heat, excess grease seepage, and any abnormal noise. Check water supply to packing glands, check packing glands for heat and excess leakage. Check all grease cups and refill if half

empty. Be sure all bearings and packing glands are checked with pumps running during operators test. Check all lights, except switch board lights, and change if needed (**note:** all incandescent light bulbs should have a glass cover over them. Report any that are missing to the operator). Pick up any trash and paper in yard and around station.

Operator: Check the operation of all equipment that is in service. Run each pump, sump pump, vacuum pump, and air compressor at each station. Make necessary repairs or replacement of equipment required for normal station operation. Check all switch board lights and change if needed. Check elevation gauges for proper operation, and insure that pumps are operating at automation at the proper levels. Bleed air compressor tanks and regulator bowls. Re-pack pumps as needed. Assist and supervise helper in his/her daily routine.

Fill in all log books (sign first initial & last name, not just initials) and Route Reports **legibly**. Print if necessary. The time you arrive and leave the station must be recorded. Record amp and kilowatt readings (if possible) on all units in the station log book. (Stations having four speed pumps - record amp and kilowatt readings for all speeds at least once a week). Route Reports must be turned in to the supervisor(s) at the end of each day. Be sure to list all equipment which needs repair or work, and make verbal reports of all problems to your supervisor upon turning in your route report.

Any problems found during your station inspection that hamper normal operations are to be reported to your route supervisor **immediately**. Do not wait until later in the day. If you are unable to contact your assigned route supervisor via radio, have the operator at Station "A" beep him. If no response is received within five minutes, contact another route supervisor.

Weekly Work

Helper: Clean upper and lower level floors. Sweep and mop upper level floors, and hose down lower levels and steps. Dust and wipe down all equipment, using varsol or degreaser if necessary. Dust switchboards. Clean all bathroom facilities and be sure that all facilities are in working order. Clean sump holes and sump pumps. Cut grass and edge around fences, cut down trees growing in fences. Cut grass growing in cracks of station yard and surrounding sidewalks. If no weed eater is available you are to use a flat shovel to clear the cracks. Load all trash on truck for dumping in the dumpster by Station "D", at the end of the day.

Operator: Check all station equipment as per daily work schedule. Assist and supervise helper in all his/her work. **Never leave helper unsupervised**. The operator should assign specific work for the helper to perform during this time. Thoroughly check all stations for which complaints have been received since the previous daily check. Operate all valves in station. Be sure the valves are left in the proper operating position, and grease all valve stems before operating.

Monthly Work

Operators: Purge bubbler tubes. Check all discharge pressure gauges and elevation gauges to make sure they read "0" when disconnected from system. Check all other gauges in station for proper operation. Grease all pumps and equipment in the stations assigned for each day during the first week of each month. Check the operation of the normal operation

feeder and emergency feeder, and make sure that the change over switch operates properly.

Quarterly Work

Operators: Operate station isolation valve. Record number of turns and direction to open/close on your route sheet.

Semi-Annual Work

Operators: Grease all pumps and motors that use grease.

2.5.2.5.1.2 – Log Book Entries Automatic Sewer Stations

The station logbook serves as a record of the operational status of the station, as well as a record of the maintenance performed at the station. It is a "personal diary" of day-to-day events that are recorded for future use, and is often used in legal proceedings. Because of that fact, it is extremely important that all entries are legible for any and all to read - print if necessary.

It is also important that your log entries consist of information that is useful in documenting the station's operational status. You do not need to confine your documentation to 2 or 3 lines in the logbook. Give some details to what is going on at the station. If you were to use a half-page each day for your log entries, the standard 150-page logbook would last over a year. The name of the station should be recorded inside of both the front and back cover, as labels on the outside tend to fall off over time.

Logbook entries should contain at least (but are not limited to) the following:

1. Date
2. Time entering and time exiting station - use military time. (A station inspection without specific times noted is useless in many instances).
3. Elevation of wet well upon arrival at station. (If it is determined during the inspection that there was a problem with the bubbler system, note same along with the corrected elevation reading).
4. Amp and/or kilowatt readings if available. (Having electrical readings to compare can aid in determining possible pump and/or motor problems). Readings on single speed units are to be recorded at each inspection. readings for multiple speed units may be recorded once a week. Identify unit, speed and electrical reading.

   Example:

#1 unit	**Amps**	**Kilowatts**
1st.	60	110
2nd.	75	125
3rd.	90	140
4th.	100	150

5. Pump(s) on "auto" and which is lead or lag.

6. Any problems detected and/or corrected.

7. Any maintenance performed by departmental personnel, personnel from other departments or contractors.

8. If you re-pack a pump note the size packing used, the number of turns placed between the neck ring and lantern ring, and the number of turns placed between the lantern ring and the packing gland.

9. If you are responding to any type of complaint regarding the station, make a notation of same along with the resulting findings of your inspection.

10. Discharge pressure (if available) with pump running, and with pump off.

11. Equipment out of service and reason why. This should be documented until such time as equipment is back in service.

12. The last entry should be the first initial and full last name of the employees making the inspection.

2.5.2.5.1.3 – Sanitary Sewage Overflow Response Action Plan

The purpose of this policy is to inform all employees of their responsibilities relative to the proper notification of sewer force main breaks and/or sewer pumping station outage. Operation personnel must keep in mind that their first priority is to ensure the proper operation of the pumping stations and the welfare of the citizens of the City of New Orleans.

I. The following procedure is to be followed upon notification of a Sewer Force Main break:

1) Supervisory personnel are to make an "on-site" inspection to verify that the problem is a sewer force main break. Once this has been verified, a course of action is to be developed to valve off the affected area so repairs can begin. After the proper course of action has been determined, Operations Department Personnel shall shut down all stations that pump into the section of the force main which needs to be isolated. Once the stations have been shut down all stations that pump into the section of the force main which needs to be isolated. Once the stations have been shut down, the Networks Department will close off the necessary force main valve(s) to isolate the break.

2) The following are to be apprised immediately of the situation:

Central Yard Networks Department and Emergency Department:
Networks Department 942-2920
Emergency Department 942-2920
Machine Shop/Welding Shop (Only if it is a steel pipe):
Machine Shop 865-0512
Welding Shop 865-0509
Department of Environmental Affairs No. 942-3855
Departmental Chain of Command (See attached)
Notify the proper treatment facility (Eastbank or Westbank Sewerage Treatment Plant) depending on affected area and the severity of the break.
EB No. 277-5400 WB No. 392-9729

3.) Bypass valves for the collection areas in which stations are shut down are not to be opened until it has been determined by supervisory staff that it is absolutely necessary. Immediate Notifications to "2C" above is required in the event a forced bypass becomes necessary.

4.) Supervisory personnel shall remain available until repairs have been completed. This is to facilitate getting the system back in service as quickly as possible after repairs have been made.

5) As soon as the force main is repaired, any valves closed to facilitate repair are to be re-opened and the stations put back to the normal operating condition. Any bypass valves that were opened are to be closed as soon as the station for the area is back in service.

6) Notification of completed repairs are to be made to "2C", "2D", and "2E" above as soon as possible.

7) Supervisors must provide a written report of the event documenting the dates and times of the sequence of events to "2C" above as soon as possible. If a forced bypass or overflow or spill at the station was incurred by a Bypass/Overflow/Spill Report (a sample is attached) is also to be submitted to the appropriate personnel.

8) If stations were shut down and no forced bypass occurred at the station, a Station Outage Report ,it is submitted to "2C" above (a same is attached).

9) If it is after normal working hours, contact individuals in paragraph 2 above by beepers.

II. The following procedure is to be followed upon notification of a Sewer Station Outage:

1) Supervisor Personnel are to make an "on-site" inspection to verify that the problem is a station outage. Once this has been verified, a course of action is to be developed so repairs can begin. After the proper course of action has been determined, Operations Department Personnel shall contact the proper department(s) so that the repair work can start immediately only if the required work <u>is NOT</u> within the operations personnel's responsibilities.

2) The following are to be apprised <u>immediately</u> of the situation:

Central Yard Networks Department and Emergency Department (ONLY IF NEEDED as judged by supervisor):
Networks Department <u>942-2920</u>
Emergency Department <u>942-2920</u>
Machine Shop/Welding Shop/Electric Shop (AS REQUIRED):
Machine Shop <u>865-0512</u>
Welding Shop <u>865-0509</u>
Electric Shop <u>865-0550</u>
Department of Environmental Affairs No. <u>942-3855</u>
Departmental Chain of Command (See attached)
Notify the proper treatment facility (Eastbank or Westbank Sewerage Treatment Plant) depending on affected area and the severity of the break as judged by supervisors(s).
EB No: <u>277-5400</u> WB No. <u>392-3855</u>

3) Bypass valve(s) for the station are not to be opened until it has been determined by supervisory staff that it is absolutely necessary. Immediate notification to "2C" above is required in the event a forced bypass becomes necessary.

4) Supervisory personnel shall remain available until repairs have been completed. This is to facilitate getting the station back in service as quickly as possible after repairs have been made.

5) As soon as the station becomes operational again, all valves must be

2.5.2.5.1.4 - Bypass/Overflow/Spill Report

Department of Drainage & Sewerage Operations
Bypass/Overflow/Spill
Sample Report

Facility: CODE:

Location:

From Date: Time: Note:
To Date: Time:

Elapsed Period is: Days: Hours and: Minutes:

Total Elapsed Time in Minutes:

Quantity (gal):

Analytical Results:

Cause of Bypass/Overflow/Spill:

Steps Taken to Reduce OR Eliminate Bypass/Overflow/Spill:

Steps Taken to Prevent Reoccurrence:

Reported to Environmental Affairs On:

Date: Time: Individual Receiving the Report:

Date: Individual Submitting the Report:

cc: Environmental Affairs, Deputy Director, General Superintendent, Chief of Operations

2.5.2.5.1.5 – Station Outage Report

DRAINAGE/SEWERAGE OPERATIONS DEPARTMENT
SAMPLE STATION OUTAGE REPORT

DATE:

FROM: Sewerage Operations

TO: Rudy August, Environmental Affairs Department

RE: Report of Station Outage CODE:

STATION NAME/NUMBER:

ADDRESS:

Date Outage Occurred:

Problem was Detected Due To:

Scheduled Station Inspection: Response to Complaint Call
Time Time

Problem Found:

Action(s) Taken:

Station Back in Service:
Date: Time:

Supervisor
Sewerage Pumping Operations

2.5.2.5.1.6 – Daily Checklist of Unmanned Stations

Personnel from the Department of Operations inspect the equipment in the lift and pump stations a minimum of three times per workweek. Information gathered is detailed in the Routine Work Schedule. More involved maintenance is performed by the Department of Facility Maintenance at the request of the Department of Operations.

2.5.2.5.1.7 – Sewerage Pumping Operations Complaint Report

SAMPLE COMPLAINT REPORT

DATE:_____TIME RECEIVED (use military time)_____
1) CALL RECEIVED FROM:

Person's Name_____Phone #_____

Department, Company, or Address:_____

2) TYPE OF COMPLAINT (check one):
_____Complaint of high sewer _____Complaint of sewer odor
_____ Other (explain):_____

Address or location of complaint:_____

3) PERSONNEL CONTACTED TO INVESTIGATE COMPLAINT:

Name:_____TK#_____TimeContacted:_____

Name:_____TK#_____Time Contacted:_____

4) RESULT OF INVESTIGATION (check one):
_____Station(s) checked out okay. _____Station(s) out of service.

Reason_____

Station(s) checked:_____

Elevation of sewer(s) (must be filled in):_____Time of completed investigation:_____

5) Note: If the complaint was received from a S&WB department, you are to call them back and inform them if there was a problem at the station (and if the problem was corrected), or if the station was functioning properly.

Time of callback:_____ Department called:_____

Full name of person you relayed information to: _____

6) SIGNATURE OF PERSON TAKING COMPLAINT INFORMATION:

(sign here:_____. If you watch ends before the complaint is resolved, it is your responsibility to relay this information to your relief, as well as what action you have taken. To verify this information has been passed on, see that your relief signs below.

(relief signs here):_____
7) SIGNATURE OF PERSON COMPLETING THIS REPORT:

(sign here):_____

Use back of page if needed for additional comments or information. Please make every effort to ensure that this form if filled out completely and accurately.

SECTION 3
COMMUNICATION AND REPORTING

3.1 GENERAL

There are three types of wastewater situations which can occur in the collection system that can result in an overflow requiring reports to be submitted to the E.P.A. and the La. D.E.Q.

3.2 SEWER HOUSE CONNECTION AND MANHOLE DISCHARGES

The first type involves an overflow from a sewer house connection (S.H.C.) or a sewer manhole caused by an obstruction, defect in the piping or other cause. This type of problem is usually first detected by a private citizen and reported to the Board as either a blockage on private property or a possible overflow of the sewer cleanout or a sewer manhole in the street.

The complaint is called in to the 24-Hour Customer Service Center by the citizen or possibly a Board employee who observes the problem. After an initial data query, the Customer Assistance Specialist then issues a service request (example attached) which is routed electronically via network computer to the emergency dispatcher who will radio dispatch an emergency inspector to investigate the problem as soon as possible. The operation is staffed on a twenty-four hour, seven-day basis. The Emergency Inspectors are assigned specific routes in the city and the inspection is assigned accordingly.

Once the Inspector confirms that a blockage or overflow exists within the Sewerage and Water Board system, the inspector relays this information back to the emergency dispatcher by radio. The Dispatcher then initiates a phone call and a work order to the appropriate department so resolution of the problem can be accomplished as soon as possible. A typical work order is provided as an example. The work order will contain specific work codes to identify a sewer house connection overflow (SHCOF) or main sewer overflow (SMOF), both of which are given a Priority A for emergency response which is the highest level priority.

The work order is transmitted via the local area network (LAN) computer system to the appropriate Zone Manager for assignment to a Maintenance Team for corrective action. The Manager typically assigns the work by radio to ensure for rapid response. If the problem occurs at the start of either of the two (2) daily shifts the manager will distribute the work order.

The Maintenance Team responds to the location indicated on the work order and corrects the problem. The inspector will note the work done by writing a description at the bottom of the work order. This may include the resolution of the problem or the referral to another team, such as pipe repair or replacement, if necessary. If the job is referred by radio, the Lead Technician completes the Board Networks Work Order form in the field (copy attached).

The work orders are collected and reviewed for accuracy at the end of each shift and sent for entry into the Asset and Facility Maintenance System as a record of the job. Copies of all work orders bearing the SMOF and SHCOF codes are also hand-carried daily to the Environmental Affairs Division (EAD) and Technical Services for their information in completing the SSO reports which are sent to EPA and La. D.E.Q by the Environmental Affairs Division. These reports are hand-delivered to avoid “pick-up” jobs, which are those jobs assigned that may not have originated as a SMHOF or SHCOF complaint, from being overlooked in the record keeping phase.

These Sewer House Connection Overflows and Sewer Manhole Overflows (SSOs) are typically short duration small volume overflows, which, at the request of EPA Region 6, are reported monthly by the

EAD and Technical Service department. The EAD and Technical Services Department tracks these jobs on a weekly basis. As a quality assurance measure, the EAD queries the Asset and Facility Maintenance System, for a listing of SHCOF and SMOF coded work orders. The work order copies generated by the query are compared to the copies that were hand-delivered by the Zone Manager as a safeguard against overlooking any report, especially "pick-up" jobs.

The EAD uses the information in the work order tracking report to determine when the problem was first discovered and confirmed by Sewerage and Water Board personnel as a valid complaint to calculate the duration of the overflow. The elapsed time of the overflow event is reduced to minutes and a total potential volume for the overflow is calculated using estimated flow rates. This estimate of possible maximum volume from an overflow does not indicate that any or all of the overflow reached the drainage system.

The EAD Supervisor then takes the data generated to prepare a notification letter. These reports are submitted monthly based on our understanding with E.P.A. that this reporting frequency is acceptable.

The types of situations requiring more immediate reporting to E.P.A. and La D.E.Q. are those usually involving greater volumes of sewage that reached the drainage system and caused by unusual circumstances. These include sewage pumping station outages and force main breaks. Another type of unusual event would be an operational upset at the sewage treatment plant requiring routing of flows to the river. However, this type of situation is rare and the discharge report is developed from information received directly from the treatment plant.

3.3 SEWERAGE PUMPING STATION DISCHARGES

A pump station outage is usually reported by the operator as a result of a periodic scheduled inspection of the station route. An overflowing sewer manhole (SMOF) may also indicate an outage, in which case, the tracking method described under Sewer House Connection and Manholes Overflows is employed.

The pump station operator will return the station to service and note in the station log that an outage has occurred. The Pump Station Operator will also immediately advise supervisor of the outage. A determination is made at this time the Sewerage Pumping Operations (SPO) Supervisor of whether an overflow has occurred, due to the outage.

The location, time, date and other pertinent information is cross-referenced to the work order tracking reports by the EAD to determine any correlation with the Networks Department reports. If an overflow has occurred, the EAD staff works with the SPO Supervisor to determine duration, estimate flow and volume and determine that appropriate action is undertaken. This information is reduced to the overflow report form (page 51) which EAD uses to prepare the notification letter. These notices are sent as soon as possible to the E.P.A. and D.E.Q. as required.

3.4 SEWERAGE FORCE MAIN DISCHARGES

In the case of a sewer force main break, the work order may originate from a citizen complaint, Sewerage and Water Board inspection or a notice of reduction in flow from the sewerage treatment plant. This type of problem results in the EAD and the Zone Manager as well as the General Superintendent, Chief of Networks, Principal Engineers and Pumping Operations being notified immediately. Staff is available twenty-four (24) hours, seven (7) days a week for this purpose.

The Manager, EAD Supervisor or EAD on-call person, and usually the Department Heads of Networks, and Sewerage Pumping, will converge on scene to determine immediate remediation action. The

appropriate work orders are generated, but input is received by all departments involved to assist in estimating volume and duration for reporting purposes. In the case of environmental impact from these incidents, the E.P.A. and La. D.E.Q. are advised verbally of the problems and the written notice is forwarded as soon as possible pending all necessary information being developed.

The records keeping and reporting process for this type of event is supervised by the Engineer in charge of the repair work because the Sewerage and Water Board recognizes the potential for this type of an event to have a higher potential for adverse environmental impact. The accelerated record keeping process also allows the Sewerage and Water Board to provide more timely information to E.P.A. and D.E.Q. of these events and their resolution.

SECTION 4
SANITARY SEWER OVERFLOW CONTAINMENT PLANNING

4.1 GENERAL

Sanitary Sewer Overflows can be caused by blockages or restrictions in service connections laterals or sewers, damaged or deteriorating gravity sewers or force mains, and equipment or power failures at pump stations or lift stations. Most discharges are minor and can be promptly cleaned up as part of the standard work order procedure. Occasionally a discharge or overflow is of such a magnitude or duration that a coordinated action plan must be developed to minimize the impact on nearby waterways or public areas.

When these situations do arise, most commonly associated with force main repairs or pump lift station failures, Board personnel will be required to make a number of decisions very quickly upon arriving on the site. Fortunately, in many cases the discharge can be returned to the gravity system with little or no environmental impact. If this cannot be done, however, every effort must be made to contain the discharge when the condition exists to be re-directed into the sewerage system. In order to communicate and coordinate with all associated Board personnel a plan must be developed to identify these agreed upon actions.

The plan must consider all available options for immediately eliminating the discharge or diverting to a containment area, as well as options for containing the contents of, for example, a damaged main which will be evacuated during repair work. It is impossible to anticipate all the specific conditions and factors which may be relevant for any particular incident. Each incident will be unique.

4.2 DETERMINATIONS

The following are some of the more significant considerations impacting the ultimate approach to mitigation activities.

- Determine if any or all of the discharge can be returned to the sewerage system. If so, how much, where and by what means?

- Determine the anticipated duration of the repair activity.

- Determine if normal sewage flow be rerouted and if so how much?

- Determine the number and location of the pump stations that will be affected by isolation of the force main.

- Determine if any of the stations have the capability to bypass flow to the gravity systems.

- Determine how long the normal sewage flow in the affected gravity sections can be interrupted before property damage or upstream overflows occurs.

- Determine the capability to create in-system containment by artificial draw down of the associated gravity system(s) and if possible, how much?

- Determine the capability to create a containment area utilizing a drainage canal or catch basin and how would the flow be reintroduced into the sewerage system and is an effective clean up of the containment area possible? (One or more containment areas could be considered not only at the

repair site, but at an affected pump station or other location).

- Determine the capability to haul sewage (vac tanker, vac truck etc.) from either the repair site or anticipated up-stream overflow location.

- Determine the likelihood of a rainfall event during the repair or clean-up activities.

Because of the varying conditions, locations and circumstances impacting on the planning process, the development of specific procedures is not practical. It is far more important for a response action plan to provide for the availability of resources including senior management expertise, such that a response can be initiated in an expedient and thoughtful manner. As evidenced in other sections of this document, the Board has a policy of requiring Division and Department managers to be available on call 24 hours per day and to personally respond to all emergencies including Sanitary Sewer Overflows.

The ability to call on the experience of these managers as a matter of policy, insures all possible avenues of mitigation are considered and all required resources are dedicated to this response effort.

4.3 – CONTAINMENT SCENARIOS

In order to assist in the mitigation the discharge of sanitary sewage to the storm sewage collection system and to the waters of the United States, the following six (6) scenarios were developed:

- Gravity Collection System Blockage or Restriction
- Gravity Collection System Damaged or Deteriorated Main
- Pressure System Damaged or Deteriorated Force Main
- Pressure System Scheduled Force Main Maintenance
- Sewage Operations Single Station Failure
- Sewage Operations Multiple Station Failure

4.3.1 - Gravity Collection System Blockage or Restriction

The greatest number of discharges of sanitary sewage are caused by either blockages or restrictions in the gravity collection system. However, these events usually result in a minimal discharge of sanitary sewage due to their predominant occurrence in small diameter sewer lines with low flow. The best approach in handling these problems is to mitigate the discharge of sanitary sewage which involves attacking the cause of the overflows. By quickly removing the blockage or restriction and re-establishing normal flow in the system, the total discharge volume is reduced. Once the blockage or restriction has been removed, steps can be taken to remove any discharge of sanitary sewage that may be present. Combination units in conjunction with teams using hoses can attempt to vacuum up material deposited during the discharge and return same to the sanitary sewage collection system.

4.3.2 - Gravity Collection System Damaged or Deteriorated Main

The volume of discharge of sanitary sewage resulting from damaged or deteriorated gravity mains can vary greatly depending on the location of the defect in the collection system, as well as the location of the system itself. The failure of an 8" main at the shallow, high end of the system generally will present less of a threat of discharge than the collapse of an 18" downstream. However, the failure of an 8" main in a well-point sand environment can present more of a challenge than that of a much larger main installed in clay and result in a larger possible discharge if action is not taken to mitigate the discharge. Thus, the method of attack used to handle spill containment and mitigation involving needed repairs to damaged or deteriorated gravity mains depends on the anticipated duration of the corrective

maintenance activity.

If a Networks Division repair team can be dispatched to the scene as soon as the problem is detected, sewer-to-sewer diversion by pass pumping will not be set up. The team will either complete the necessary repair work that day or break out the defective pipe freeing the obstruction to normal flow. This will eliminate the discharge. At that point, steps will be taken to return discharged sewage to the collection system. However, if the repair team is unable to complete the repairs or provide relief, then sewer-to-sewer diversion pumping will be set up and operated until the obstruction is removed. Once repairs have been completed, the area will be cleaned up and discharged sewage returned to the collection system wherever possible.

4.3.3 - Pressure System Damaged or Deteriorated Force Main

Many factors must be considered by the personnel who respond to the discharge of sanitary sewage created by the failure of a damaged or deteriorated force main:

- the size and material composition of the main.
- the location of the damaged or deteriorated main in the force main system.
- the ability to isolate the damaged or deteriorated force main and re-route the flow.
- the number of stations affected by the main and its isolation.
- the ability to store sanitary sewage in the sewage collection system before a discharge is needed to prevent impact on life, health, or significant property damage.
- the anticipated rainfall that may occur before repairs are completed to the force main.
- the ability to contain and store the discharge of sanitary sewage in canals or drainage collection system near the location of the force main failure, including the volume of such containment before the sanitary sewage reaches the waters of the United States.
- the ability to effectively re-introduce the contained sanitary sewage into the sanitary sewage collection system for proper treatment and disposal.

Time is of the essence. It is impractical to list exactly all locations in the Board's force main system where containment and re-entry of discharged sanitary sewage into the sanitary sewage collection system is a possibility. However, the employees responding to emergencies of this nature are thoroughly familiar with the Board's systems. Based upon their technical expertise, they decide the proper course of action to be taken once they have assessed the situation.

4.3.4 - Pressure System Scheduled Force Main Maintenance

When scheduled maintenance is required to the force main system (i.e. exercising of valves that may result in the discharge of sanitary sewage into the storm water collection system, tying in new mains to the force main system, repairs to a force main valve, etc.), coordination between the Board's Networks and Operations Departments is required. They consider the following options prior to the initiation of any force main scheduled maintenance:

- The anticipated duration of the outage of the force main system.
- The number of stations affected by the outage.
- The ability to re-route flows during the outage.
- The ability to drag down the collection systems contributory to the force main that will be out of service to allow for system storage before the discharge of sanitary sewage to the storm water collection system is necessary.
- The weather forecast prior to and during the scheduled force main outage.
- The ability to contain sewage that may be discharged into the storm water collection system and re-introduce it into the sewage collection system after the force main is restored to service.

As is the case for outages of force mains due to deterioration or damage, it is impractical to list exactly all locations in the Board's force main system where containment and re-entry of discharged sanitary sewage into the sanitary sewage collection system is a possibility. However, the employees coordinating scheduled force main maintenance are thoroughly familiar with the Board's systems. Based upon their technical expertise, they decide the proper course of action to be taken once they have assessed the situation.

4.3.5 - Sewage Operation Single Station Failure

When a single sewage pumping station is reported out of service, staff is dispatched to the scene. The department's goal is to have that individual present at the station within 30 minutes of notification. When that individual arrives, the situation is analyzed using the following criteria:

- The staff member determines if the station be returned to operation quickly (i.e. by resetting a circuit breaker, or unclogging a bubbler line) or will the station be out for a protracted period of time due to a major failure. For example, the station is down due to a lightening strike or fire that has destroyed major electrical components or a mechanical failure that has resulted in a flooded station requiring the removal and drying of components.
- The staff member determines if there is sufficient storage in the system to avoid an overflow prior to the return of the station to operation.
- The staff member determines if storage is inadequate, can the station be bypassed using portable pumping units.
- The staff member determines if the level of sewage in the system be reduced or the level maintained sufficiently low enough to avoid an overflow by using a portable pump from the system serviced by the affected station to the collection system serviced by an adjacent pumping station.
- The staff member determines if there is discharge of sewage into the storm drainage collection system and is containment and re-introduction into the sanitary collection system possible?

The staff uses their knowledge of the stations and their relationship to the other systems of the Board to select the proper combination of resources available to them to eliminate or mitigate the discharge of sanitary sewage into the storm water collection system.

4.3.6 Sewage Operation Multiple Station Failure

The Board rarely experiences outages of multiple sewage pumping stations at the same time. When this occurs it is generally the result of an Act of God (i.e. hurricanes) that has affected the source of commercial power over a large portion of the City of New Orleans. In those cases, there is little that can be done to mitigate the discharge of sanitary sewage to the storm drainage collection system. However, for those cases not involving the loss of commercial power, the Board has or is in the process of obtaining generators, submersible pumps and portable sewage pumping station control equipment to provide for temporary pumping of the sewage until the stations have been returned to service.

SECTION 5
AVAILABLE EQUIPMENT

5.1 VEHICLES

The following pages list the available equipment within several departments of the Sewerage and Water Board. These departments are involved with emergency response on a daily basis. While each of these departments does not have a specific list of equipment identified exclusively for sewer, water, drainage or power, each department does remain committed to providing the resources required to prevent or minimize a SSO to the maximum extent possible. In fact, these events are given the highest priority and any and all resources necessary to remedy the problem are made available. The lists are separated by the domicile or "home" departments which are separated as follows:

Department	Domicile Series
Stations	2000
Facility Maintenance	4000
Network	6000
Warehouse	9000

Equipment needs are evaluated by the Sewerage and Water Board on an annual basis and purchased based primarily upon this evaluation. This document is not intended to limit equipment to its current levels in quantity, description, operator or any other identified category. The Board remains committed to reviewing the equipment needs on a continual basis and providing for additional equipment during the time periods when it is required

5.2 ON-TRUCK RESOURCES

In addition to the equipment list for each department, each department has standard equipment that is contained on the trucks. This equipment is available to the team in the activities to prevent and minimize the affects of any Sanitary Sewer Overflows.

Standard Equipment on Emergency trucks:

- Standard Equipment on Inspector Vehicles:
  - Multi channel two way communication radio
  - Hydrant spanners
  - Pressure Gauge
  - Various hand tools
  - Stillson wrenches
  - Valve keys
  - Hammers of various sizes
  - Mirrors
  - Safety equipment
  - Leatherwork gloves

Hard hat
Safety boots
Sewer and water maps

- Standard Equipment on Networks Crew Trucks:
  Two-way communication radio
  Hose with adapters
  Grade rods
  Probing rods
  Wrenches
  Oil
  100 foot tape
  6 foot ruler
  Valve finder
  Sewer maps
  Hydrant key
  Flashlights
  Mirrors
  Fire extinguisher
  Shovels
  Pick and handle
  Guide pipe with extension
  Tongs
  Chisels
  Gas cans (unleaded and diesel)
  Disinfectant
  Various colors of dye
  16 lb maul
  Bucket
  Water cooler
  Gasoline powered fresh air blowers, w/ required attachments
  Different sizes and types of pipe
  Pipe joint connecting materials
  Pipe fittings
  Chain saws with various blades
  Paving breaker adaptor for back hoe
  175 cfm air compressor mounted on truck (2.5 ton truck with team cab)
  Air hammers for breaking concrete and driving sheeting
  Air powered backfill tampers
  3" water pumps, both diagram and centrifugal
  3" suction and discharge hoses
  Cement finishing tools
  Electrically powered, truck mounted hoisting winch
  Bricks
  Portland cement mix
  Portable lighting
  Mechanical and air inflated test plugs, various sizes

  Caulking tools
  Blow-torch
  Broom, brush

Buckets, storage cans
Grease gun
Locator valve
Nozzles, various sizes
3" pumps, diagram and trash
Sounding rod
Safety equipment:
    First aid kits
    Safety cones, signs and flags
    Hard hats
    Safety vests
    Steel toe hip and waist boots
    Fire extinguisher
    Safety gloves
    Safety goggles
    Safety vests
    Ear protectors
    Rain suits
General hand tools:
    Crowfoot
    Hacksaw
    Engineers' hammers, various sizes and types
    Flashlight
    Pliers
    Ruler
    Hand saws, various
    Steam drivers

- Large Investigation Vans Have All of the Above Plus:
  Air blowers
  3" pumps
  Large safety signs and type I barricades

- Standard Equipment on Flushing Trucks:
  Hoses
  Several types of nozzles
  Grade rod
  Hand tools
  Steam driver
  Oil
  Crescent wrenches
  Allen wrench set
  100 foot tape
  Hydrant key
  Flashlight
  Mirrors
  Valve finder
  Sewer maps
  Suction pipe

Safety equipment
Safety cones, signs and flags
Hard hats for each member of the team
Safety vests for each member of the team
Steel toe hip and waist boots for each team member
Fire extinguisher
Safety gloves for each team member
Boot for flushing hose
16 lb maul
Bucket
Stump bar
Water cooler
Pick and handle

5.3 Other Resources - Catastrophic Emergency

In addition to the equipment listed in the previous sections, the Sewerage and Water Board has enjoyed a successful, cooperative relationship with the contractors and other utilities in the area. In the event of catastrophic emergency situations requiring resources not available to the Board response staff, neighboring parishes and local contractors and suppliers are available to either supply any available equipment, material, and staffing required to respond directly to the emergency situation. In addition, procedures for responding to reasonably anticipate catastrophic emergency situations are listed in the **Sewerage and Water Board, Operations Department, Emergency Procedures Manual** included in Appendix F.

Examples of organizations that may be available to assist in the response to catastrophic emergency situations include:

Jefferson Parish
St. Bernard Parish
City of New Orleans Agencies
Boh Brothers Construction
Drennan Construction
Video Industrial Services
Insituform
Louisiana Industries
Various equipment rental agencies

When a catastrophic emergency situation occurs, the response to the failure is identified and the required equipment, materials and manpower is tabulated. This listing is then compared with existing, available Board supplies. Areas where the required resources exceed those that are available in-house are identified and the appropriate organizations are contacted.

SEWERAGE & WATER BOARD OF NEW ORLEANS
SEWAGE OVERFLOW ACTION PLAN
LIST OF APPENDICES

Appendices

Appendix A	Plan of the City of New Orleans Sewer System
Appendix B	Plan of the City of New Orleans Sewer System Northeast Section
Appendix C	Plan of the City of New Orleans Sewer System Western Section
Appendix D	City of New Orleans Major Sewer Main Layout
Appendix E	City of New Orleans Lift and Pump Stations
Appendix F	Sewerage and Water Board – Operations Department Emergency Procedures Manual
Appendix G	Sewerage and Water Board – Employee Training Manual
Appendix H	Sewerage and Water Board – Safety Manual