

SAFETY MANUAL

WASTEWATER TREATMENT PLANT OPERATION AND SEWAGE COLLECTION SYSTEMS

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INTRODUCTION

This Health and Safety Rulebook is presented for the use of all employees of this utility to assist in the administration of our safety program and to provide means and methods that will aid in the performance of our various assignments in a safe and efficient manner.

It is the intent of the utility to conduct its operations in a safe and efficient manner with the utmost regard for the health and safety of the employees and the public. Safety is an integral part of everyone's duties and responsibilities.

This Health and Safety Rulebook expresses the basic safety policies of this utility. Each employee and wastewater treatment system is expected to ensure proper application of its contents.

RESPONSIBILITY

Management

The employer shall have the same responsibility for safety as for any other part of the operation.

The employer shall appoint only competent personnel as supervisors, who shall be responsible for the safety of those under his or her supervision.

The employee shall require a supervisor to observe and enforce all safety rules.

The employer shall provide adequate automotive equipment, tools, and protective devices, and insist upon their proper use and maintenance.

The employer, or designated representative, shall fully investigate all serious accidents and take remedial steps to prevent repetition of similar accidents wherever possible.

The employer shall be responsible for safety records and shall be responsible for completing safety inspections and maintaining records to reflect findings and corrective actions taken.

The employer shall require employees to use suitable tools and equipment in order that they may perform their work in a safe manner.

The employer shall require employees to be instructed in safe methods of performing their work.

The employer shall require employees who, in the course of their work, are subject to the hazards of electrical shock, asphyxiation, or drowning, to be instructed in accepted methods of artificial respiration.

Supervisor

Supervisors shall have the same responsibility for safety as any other part of their wastewater operations.

Supervisors are at all times responsible for the execution of the work in a safe manner and for the job performance of all personnel under their direction.

Supervisors will be held accountable for all accidents and employee actions unless investigation indicates the actions were due to conditions beyond the supervisor's control.

Supervisors shall instruct all new employees on the reporting of all accidents and the prompt receipt of first aid.

Supervisors shall be responsible for the training and instruction of new employees and of employees transferred to their supervision.

Supervisors shall fully understand and comply with the safety rules of this manual. They shall also ensure that safety rules are understood by the wastewater operators under their supervision.

Supervisors shall insist on employees observing these safety rules and shall use disciplinary measures, if necessary, to obtain compliance.

Supervisors shall be responsible for the proper use of safety devices and equipment by the employees under their supervision.

Supervisors shall be responsible for the regular inspection of all tools and equipment, including employees personal tools used while working under their supervision.

Supervisors shall ensure no duties are assigned to an individual who is unqualified or incapable of completing those duties safely.

Before leaving a job, the supervisor shall see that the site is left in as safe a condition as possible. The supervisor shall arrange adequate warning of any condition that might endanger other employees, the general public, or inspectors.

Employee

It is the definite responsibility of each employee to so perform assigned duties while at work to assure:

- Safety for self;
- Safety for fellow employees;
- Protection for the public;
- Protection for company property, and for public and private property.

It is the responsibility of each employee to report to the person in charge all unsafe conditions or acts witnessed on the job.

When an employee is requested to perform duties under unsafe conditions, the employee should not perform those duties without first notifying the person in charge of the unsafe conditions.

It is the responsibility of management to verify that each employee is acquainted with the principles of first aid and resuscitation as soon as possible.

It is the responsibility of each employee to attend all safety meetings possible and to take an active part in safety work.

It is the responsibility of each employee to know and understand the safety rules of this manual, which will apply to the work being performed.

GENERAL SAFETY RULES

Location of Safety Manual

This safety manual has been prepared for use by the operating personnel of the company. Each employee shall be given a copy of this manual.

This manual is consistently updated to cover areas relating to the safe operation of wastewater treatment plants. A current copy may be obtained by contacting the company office.

Any comments or suggestions on improving this manual or updating information pertaining to the safe operation of equipment is welcome and may be incorporated into future editions.

Safety Meetings

Safety meetings shall be held on a quarterly basis on the first day of each quarter. The company shall provide a program suitable for the season and discuss any current regulations or changes that may have occurred since the last meeting.

All personnel shall be required to take an active part in the safety program. Personnel should offer input and disseminate information regarding the safe operation of municipal sewage systems.

Personal Conduct While On Company Business

The use of intoxicating liquor during working hours, including lunch hour, is strictly prohibited. Any violation shall be considered sufficient cause for disciplinary action.

Any employee reporting for duty under the influence of liquor, illegal drugs, or illegal smoking materials shall be dismissed. Any supervisor or other person in charge who permits such employee to work shall also be subject to disciplinary action.

Taking Chances

Before commencing any work that may be hazardous, care should be taken to establish a safe procedure. Where more than one employee is engaged in the same job, all employees shall be concerned and understand the procedures to be followed to prevent endangerment to self or other personnel on the job. Under no circumstances shall safety be sacrificed for speed.

Employees shall always place themselves in a safe and secure position. The care exercised by others shall not be relied upon for one's own protection.

Guards

No guard shall be removed from any machine or piece of equipment except to perform required maintenance.

Protecting the Public

When an employee needs additional light while working on the premises of a customer, he shall use a battery powered flashlight, or an approved properly guarded electrical extension light. An open flame light such as a match, torch, or cigarette lighter shall not be used.

When operating temporary pumping equipment in a public location, barricades shall be used to keep all traffic and personnel a safe distance away from the site.

Housekeeping

- A. Materials and supplies used at a plant site should be stored in a neat and orderly manner at the site to prevent them from falling off of shelves onto moving equipment.
- B. Junk parts removed from a piece of equipment should be disposed of in a proper manner.
- C. Spare parts used in the operation of a wastewater treatment plant should be kept in a neat and orderly manner with the item labeled to indicate on what piece of equipment the spare part is used.

Reporting Hazardous Conditions

- A. When an employee observes a hazardous condition that may cause injury or property damage, the employee shall report it promptly to a proper authority and when necessary, guard it.
- B. An employee who receives a report of a hazardous condition, either from the general public or another employee, shall immediately refer this information to the person or utility responsible for such matters.

Fire Prevention and Control

- A. Paper and other combustible materials shall not be allowed to accumulate in blower buildings or other structures in order to prevent them from getting into the machinery or causing a fire.
- B. Flammable liquids such as gasoline and diesel fuel shall not be stored in blower buildings, chlorine rooms, or other structures where they may cause a fire or leak onto the floor causing hazardous working conditions.
- C. Strict adherence shall be paid to “No Smoking” and “Stop Your Motor” signs at fuel dispensing stations.
- D. Oily rags and papers used for cleaning shall not be allowed to accumulate in service trucks and car trunks, as these can spontaneously combust under the proper conditions.

SAFE WORKING PRACTICES

Clothing

- A. Wearing of loose fitting clothing around machinery with moving parts or belt drives is discouraged, as clothing may become entangled in equipment resulting in serious injury or death.
- B. Wearing of sandals or open toe shoes in a field environment is discouraged, especially when handling tools or entering areas where weeds and debris can hide glass or sharp objects. In all cases rubber boots or leather shoes shall be worn in areas where contact is possible with biological organisms found in wastewater treatment plants.

Personal Eye Protection

Eyeglasses, even hardened lenses, are not a substitute for goggles. Full cover goggles or face shields shall be worn when an employee is engaged in or is close to work involving:

- A. Power grinding, buffing, or wire brushing, even if there is a built in eye shield.
- B. Using compressed air to remove dust or debris from a piece of equipment.
- C. Flame welding, cutting, or burning. (Approved colored lenses shall be used.)
- D. Handling of acids, caustics, dry chlorine, ammonia, or other similar liquids, except when approved complete head covering is worn.

Lifting

- A. Consider the size and weight of any object before attempting to lift or move the object. Do not lift any materials that can not be handled comfortably. If necessary, obtain assistance or wait until assistance is available.
- B. Exercise extreme care in lifting oily or greasy parts. Use proper containers or straps to remove these objects.
- C. Never carry a load that prevents you from seeing in front of you.

- D. Never carry an object over a slick or iced surface.
- E. When carrying objects near aeration or settling tanks extra care should be taken to avoid falling in the tanks or dropping objects into the tanks.

Handling of Materials and Chemicals

The two most commonly used chemicals in a wastewater treatment plant are chlorine for disinfection of the effluent and herbicides for weed control.

Dry Chlorine

- A. Dry chlorine is available in several forms: granular chlorine (HTH or PACE), tablet chlorine (Sanuril), liquid (household bleach), and gas.
- B. Dry chlorine, no matter what type – tablet or powder -- can be very volatile when mixed with other substances. It should always be kept in a dry container with the cover sealed to prevent moisture from coming into contact with the chlorine.
- C. Dry chlorine should always be handled with a clean container that is used only for handling chlorine powder.
- D. Dry chlorine should not be stored in an environment with electrical controls. If left open it can cause corrosion on electrical wiring and controls.

Chlorine Gas

- A. Chlorine gas is relatively stable when properly handled; however, cautions should be taken due to the large volume of gas that can be released in a short period of time.
- B. Keep chlorine cylinders stored in a proper enclosure to prevent unauthorized tampering with cylinders.
- C. Chain all cylinders to wall to prevent tipping.
- D. Open cylinder valve only ¼ turn, or as much as needed, to obtain sufficient gas flow to the chlorinator.
- E. Check for gas leak using ammonia bottle after changing cylinders.

- F. Always plan your escape from the chlorine room prior to attempting any service on a chlorinator.
- G. Keep chlorine gas mask available, outside of the chlorine room, in case of emergency.

Herbicides

- A. Herbicides are normally used near wastewater treatment plants to control weeds around fences and equipment and to control algae in lagoons.
- B. Always mix herbicides in a clean disposable container.
- C. Use of gloves and appropriate eye protection is recommended.
- D. Apply herbicides in proper dosages using the recommended application procedures - algaecides for lagoons and weed killers for ground application.
- E. Wash hands and clothing thoroughly after each application.
- F. Clean and dispose of unused portions and packaging materials properly.
- G. Empty containers shall be disposed of in a safe manner. They shall never be thrown into lagoons or storage tanks.

Proper Use and Care of Equipment

- A. Employees shall use tools suitable for the job in progress and only those in good repair.
- B. Employees shall avoid awkward positions when using tools to avoid possible injuries should the tools slip.
- C. When using wrenches always pull the wrench toward you, protecting hands and knuckles in case the wrench slips.
- D. Keep volt and amp meters in good working condition. You are dependent upon these instruments to tell you if a circuit is hot.

PROPER PROCEDURES

Entering Confined Spaces

- A. Confined spaces including wet wells, manholes, dry wells, or any space that is below ground level or has inadequate ventilation, has the potential for containing deadly hydrogen sulfide gas.
- B. Prior to entering any confined space, an instrument check of the space should be completed to determine the presence of gas.
- C. All confined spaces must have an operating ventilation fan. If a fan is not present and operating, personnel should not enter the confined space without an air pack or proper retrieval equipment.
- D. Portable ventilation equipment should be readily available for use in case of failure of the normal ventilation equipment.
- E. Under no circumstances should personnel enter a confined space without proper equipment or rescue personnel standing by.

Operation of Wastewater Plant

- A. Extreme caution should always be used near aeration tanks and sludge collection tanks. The aerated water is turbulent. It can be very difficult to remain on the surface until reaching a hand hold.
- B. Hoses, extension cords, and ropes not in use should not be left where operating personnel might trip over them and possibly fall into a tank.
- C. Operating personnel should never assume that a piece of equipment is turned off and will remain turned off. Most equipment at a wastewater plant operates on a time clock and may automatically start at any moment, unless locked out of service.

Maintenance of Treatment Plant

- A. Steep stairways, uncovered aeration tanks, and narrow walkways are all potential accident areas. Guard rails should be in proper repair and secured to their foundations any time operating personnel are performing their duties at a plant.

- B. Gratings shall be kept in proper place and in adequate repair. Rusted gratings should be replaced with adequate materials of construction to allow personnel to safely perform their duties.
- C. Indoor areas, such as blower rooms, pump rooms, and electrical control rooms, shall have adequate lighting for operating personnel to perform duties in a safe manner.

ACCIDENT REPORTING

In Case of Traffic Accident

- A. Stop at once to determine if anyone was injured, the nature and extent of the injury, and administer first aid and all reasonable assistance.
- B. Obtain the names and addresses of all witnesses before they leave the scene of the accident.
- C. Obtain the name and address of each driver involved, and the names and addresses of all passengers riding with such driver.
- D. Secure all available data on each vehicle involved, including make, model, type, year, state, and license number.
- E. Secure all available data from the operator, or driver's license of the driver of each vehicle involved.
- F. Note the time and place of the accident.
- G. Carefully list damage to each vehicle involved.
- H. Secure the name and badge number of any police officials who appear.
- I. If a parked vehicle is involved in an accident and the owner can not be located, a notice should be left on or in the vehicle providing the name and address of the parties involved. Within 24 hours, the police, sheriff, or highway patrol should be notified of the accident.
- J. Comply with other reports as required by state and local ordinance.
- K. Avoid discussing the accident and make no admissions of responsibility to anyone except authorized representatives. Necessary data given to a law enforcement officer should be given in private. Never obligate your employer for damages or medical expenses for non-employees.
- L. Report the accident to the main office location along with the above information.

In Case of Public Accident or Sewer Backup

- A. All accidents resulting in injury or death of a member of the public and in which the company may be involved shall be reported to the main office immediately.
- B. In the event of damage to the property of a member of the public, such damage shall be reported to the main office immediately.
- C. No employee shall make statements concerning liability or indicating that settlement will be made in any accident resulting in injury or property damage to a member of the public.
- D. It is important that the names and addresses of all witnesses be obtained in all accidents involving the public.

OPERATION AND MAINTENANCE OF COMPANY OWNED VEHICLES

Maintenance

- A. It shall be the responsibility of the driver of the company vehicle to maintain the vehicle in proper working order, changing the oil and servicing the vehicle when required to maintain safe operating condition.
- B. Whenever possible a company credit card shall be used to pay for gasoline and services to the vehicle.

FIRST AID

General Directions for First Aid

Following are nine general directions for first aid in an emergency, outlined by the American Red Cross.

1. Keep the victim lying down.
2. Examine the victim - look for serious bleeding, lack of breathing, and poisoning.
3. Keep the victim warm.
4. Send someone to call a physician or ambulance.
5. Remain calm. Do not be rushed into moving the victim unless absolutely necessary.
6. Never give an unconscious victim anything to eat or drink.
7. Keep the crowd away from the victim.
8. Ensure the victim is comfortable and cheerful.
9. Don't allow the victim see his injury.

Other General Information

Knowing what not to do in an emergency is just as important as knowing what to do. The original injury may be magnified by the wrong kind of treatment or mishandling. If a victim must be transported, ensure that methods described in a standard first aid text are used. With neck or back injuries, particularly, serious damage may occur by improperly transporting the victim. If possible, the victim should remain at the site where the injury occurred until a physician arrives, rather than risk an increase to the injury through mishandling.

ARTIFICIAL RESPIRATION

Mouth-to-Mouth Method

The mouth-to-mouth (or mouth-to-nose) technique of artificial respiration is the most practical method for emergency ventilation of anyone – adult or child – who has stopped breathing due to an electric shock, drowning, carbon monoxide poisoning, or any other cause. This method, officially adopted by the American Red Cross, has the advantage of providing pressure to immediately inflate the victim's lungs. It also enables the rescuer to judge more accurately the volume, pressure, and timing of his efforts, than does other methods. When a victim is unconscious and not breathing, the base of the tongue tends to press against and block the upper air passageway. The procedures described below should create an open air passageway when the rescuer is working alone.

1. If there is foreign matter visible in the mouth, wipe it out quickly with your fingers or cloth wrapped around your fingers.
2. Tilt head back so chin is pointed upward. Pull or push jaw into jutting out position. These maneuvers should relieve obstruction of airway by moving the base of the tongue away from the back of the throat.
3. Open your mouth wide and place tightly over victim's mouth. At the same time pinch the victim's nostrils shut, close them with your cheek, or close the victim's mouth and place mouth over victim's nose. (Air may be blown through the victim's teeth even though they may be clenched.)
4. Remove your mouth, turn your head to the side, listen for return rush of air that indicates air exchange. Repeat blowing effort. For an adult, blow vigorously at the rate of approximately 12 breaths per minute. For a child, take relatively shallow breaths appropriate for the child's size at the rate of approximately 20 breaths per minute.