

# **GRADE I NEEDS-TO-KNOW**

## **CHAPTER ONE AND TWO – PROGRAM HISTORY & COMMUNICATION**

What is the Rivers & Harbors Act and when did it pass?  
What was the Federal Water Pollution Control Act?  
What was the objective of the FWPCA?  
Define NPDES.  
When did EPA promulgate 40 CFR Part 128?  
Where would you find the Federal Pretreatment Regulations?  
What does PIRT stand for?  
What is the Domestic Sewage Study?  
Define SIU, Control Authority & Approval Authority.  
Where would you find the State pretreatment regulations?  
When was the NC-PC organization formed?  
Who must give consent to enter a facility?  
Where does the authority to enter a facility come from?  
Can pretreatment professionals sign a confidential statement prior to entry?  
Ethics are based on what?  
Can a pretreatment professional accept gifts, favors, lunches or any other benefit from an industry?

## **CHAPTER THREE – SAFETY AWARENESS**

What is the purpose of traffic safety?  
What equipment should be checked prior to leaving the office?  
What are the three concepts of defensive driving?  
What are the three things that a driver can not control?  
What are the two things that a driver can control?  
What is hydroplaning?  
Know the five different areas of traffic control and be able to identify them.  
What does OSHA stand for?  
Where can you find OSHA regulations?  
Be able to define: confined space, hazardous atmosphere, entry and immediately dangerous to life or health.  
What is an oxygen-deficient atmosphere?  
What is the leading cause of death in confined spaces?  
What is oxygen enriched atmosphere?  
What is the relationship of a flammable atmosphere to an enriched oxygen atmospheres?  
What is the source of toxic atmospheres?  
When is a permit required for a confined space?  
Where should you test for gases in a confined space?  
What is the order of testing for an atmosphere prior to entry into a confined space?  
What is the definition of lock out & tag out?

What are the minimal requirements for protective equipment?  
What is the hazard communication program?  
What does MSDS stand for?  
Be able to define: physical hazard, biological hazards and chemical hazards.  
What are the four ways toxic chemicals can enter the body?  
What is the difference between acute and chronic symptoms?  
Know the different types of labeling systems that are widely used in chemical manufacturing.  
Know the different quadrants under the NFPA labeling system and what they stand for.  
What is required to be included on MSDS's.  
What is the relationship between % and ppm?  
Be able to define: TLV, STEL, CEL, PEL, REL  
Be able to determine the different physical/chemical characteristics.  
Be able to determine the different fire and explosion hazard data.  
Be able to name different kinds of protective clothing.  
What are the four pathogens found in raw wastewater?  
How many types of viruses are found in raw sewage and sludge?  
Name the two most dangerous bacteria found in wastewaters?  
Where is tetanus found?  
How are helminthes parasites spread?  
How are viruses spread?  
Understand the polio virus and where it lives.  
What are blood borne pathogens?  
Define Hepatitis B & C and know the treatment and cure.  
What is HIV and how do you prevent it?  
How many wastewater personnel have contracted HIV from exposure to wastewater?  
What are the waterborne diseases to remember?  
Know where pathogenic bacteria live and multiply?  
Name human body fluids?  
What are universal precautions?  
Name three types of trip hazards?  
When is a ladder required?  
In a flight of stairs, how many risers are required before a handrail is required?  
What is required before an employee is required to wear PPE?  
Class A hats and caps are intended for what?  
Where are Class A hats used?  
Name some of the hazards that eye or face protection would protect?  
What glove material protects against chemical hazards?  
At what decibel is hearing protection required?  
Be able to name some mechanical hazards?

#### **CHAPTER FOUR – WASTEWATER COLLECTION**

Be able to define POTW.  
What are the objectives of the pretreatment program?

Be able to list the 8 EPA specific prohibitions.  
What are the two primary sections of the collection system?  
Name the things that cause a SSO?  
What is an SSO?  
What is I & I?  
What is required with the Wastewater Collection System Permit?  
Why are we having problems with grease in the sewer if grease interceptors were always approved by local building and plumbing codes?  
Why must we have a grease control program?  
Who generates grease?  
What is grease?  
Define hydrophobic.  
What affects the accumulation rate of grease?  
Where does grease accumulate in a sewer?  
What is the only requirement of the Collection System Permit?  
Name some of the safety devices that will be needed when inspecting a food service establishment.  
When should an inspector conduct a grease inspection?  
Name some of the common problems encountered during an inspection.  
Understand the sampling and analytical requirements for FOG.  
What does HEM stand for and what EPA method uses it?  
What is the difference between a grease interceptor and a grease trap?  
What is bioremediation?  
What is required if a restaurant wants to clean and service their grease separation device?  
Grease pumping service providers must be permitted by whom?  
Know how to recognize if a grease interceptor needs servicing.

## **CHAPTER FIVE – WASTEWATER TREATMENT**

What are preliminary treatment devices?  
What is the purpose of screening?  
What are comminutors used for?  
Why must grit be removed from the wastewater?  
What are some of the problems that can upset a primary clarifier?  
What is the normal detention time of a clarifier?  
What are some secondary treatment devices?  
What are trickling filter media made of?  
What is zoogeal film and where will you find it?  
What is a RBC?  
Why are RBC's covered?  
What is MLSS?  
Know the nitrogen cycle and how it affects wastewater.  
Name the three controls that must be maintained in an aeration tank?  
What DO is required in the aeration basin?  
Define Sludge Age, F/M, and MCRT.

Why is the velocity important in an oxidation ditch?  
Define RAS and WAS?  
What are pathogenic organisms?  
What is the purpose of disinfection?  
What are the three disinfectants used today?  
What is chlorine demand?  
What is the normal detention time of chlorine contact basins?  
What are some of the reasons why the chlorine demand will increase?  
What are the stages of treatment at a POTW?  
What is tertiary treatment and why is it used?  
What are some of the things tertiary treatment will remove?  
What pollutants does chemical precipitation remove?  
What is a tertiary filter and what does it remove?  
What are nutrients?  
Where do nutrients come from?  
What are the most common chemicals used for phosphorous removal?  
How does the activated sludge process remove phosphorus biologically?  
What bacteria breaks down nitrogen?  
What is total nitrogen?  
How many pounds of alkalinity does it take to convert one pound of ammonia?  
Know how to determine the area of a square tank and round clarifier?  
Know how to determine the cubic feet of a tank and clarifier?  
Know how to calculate the volume of a tank and clarifier?  
Be able to calculate detention time.  
Be able to calculate the pounds formula.  
Be able to determine the removal rate of a clarifier.

## **CHAPTER SIX – SIGNIFICANT INDUSTRIAL USERS**

Define SIU.  
What are the three classifications of Industrial users?  
What is a commercial user?  
What forms can categorical pretreatment standards be in?  
Define categorical user?  
Categorical regulations apply to what?  
What is the difference between new source and existing source?  
Define CWF and FWA.  
Under what circumstances must the CWF be used?  
Define regulated wastestream, unregulated wastestream and dilution wastestream.  
Define TTO.  
How often is the POTW required to evaluate if a slug control program is needed?  
Define SNC.

**CHAPTER SEVEN – SAMPLING & MONITORING**

What is the federal requirement for a POTW to sample each SIU?

What is the NC requirement for a POTW to sample each SIU?

What are the dates for each sampling period?

Where can you find the NC Laboratory Certification Requirements?

Know the difference between quality assurance and quality control.

Define container blank, field blank, field duplicate, equipment blank, trip blank and preservation blank.

Name some of the minimum requirements of a sampling plan.

What does SOP stand for?

What kind of records should the POTW keep?

What are the two basic types of samples?

Define a grab and composite sample.

What parameters are required to be collected by a grab sample?

What is the difference between a time composite and a flow proportional sample?

What should sample containers be made of?

Know the difference between BOD, CBOD and COD.

What regulation identified the type of container needed?

How do you clean sampling equipment?

What kind of detergent should be used to clean glass or equipment?

What is the correct procedure to add acid to water?

What are the recommended cleaning procedures for sample bottles for conventional pollutants?

What is the cleaning procedure for metal sampling?

What kind of tubing should be used when sampling for semi-volatile organics?

How do you sample for metals?

What is the cleaning procedure for oil and grease analysis?

Be able to identify pollutants of concern.

What are conventional pollutants?

What does LTMP stand for?

What pollutants are exempt from LTMP?

Where can you find the EPA approved methods for analysis?

All analytical analysis must be certified by?

What does HDPE stand for?

Be able to identify the three types of sampling events.

What determines the amount of sample needed for collection?

What is the definition of “analyze immediately”?

Why are holding times important?

When do holding times start?

Where is the proper SIU sampling location found?

What things should be considered for selecting an automatic sampling location?

What is the recommended procedure for collection of different types of samples?

What three analyses must be collected in the actual sample container?

What things are allowed to cool samples to 4° C?

How do you preserve a metal samples?

What kind of sample container is required for O&G?  
How do you preserve an O&G sample?  
Where do you sample for O&G?  
What sample container is used for volatile organic compounds and extractable compounds?  
Be able to discuss VOC sampling procedures?  
What kind of sampling container is used for cyanide sampling?  
How do you preserve a cyanide sample?  
What EPA method is used for low-level mercury analysis?  
How often is a pH meter required to be calibrated?  
How many standards must a pH meter be calibrated with?  
What is the minimum federal pH standard?  
How far apart should the standards used for pH calibration be to verify calibration?  
What should the accuracy of a pH meter be?  
Understand how the buffers are used for a pH meter.  
What are the units for conductivity?  
How should a mistake be corrected in field records?  
What is required on a COC record?  
An Evidentiary COC records what period of time?  
Be able to convert  $\mu\text{g/l}$  to  $\text{mg/l}$ .  
Be able to identify priority pollutants?

## **CHAPTER EIGHT – FLOW MONITORING & SAMPLING EQUIPMENT**

What are the two different kinds of flow channels?  
What is a weir?  
Define Parshall, Palmer-Bowlus, Trapezoidal and H Flumes?  
What are some of the sources of errors in a primary device?  
What does the venturi meter measure?  
What types of meters are associated with a closed pipe metering system?  
When are electromagnetic flow meters used?  
What are secondary flow monitoring devices?  
What are the different types of flow monitoring devices?  
What are the common errors in use of the secondary device?  
What are the five interrelated subsystem components of an automatic sampler?  
What should the sample volume storage be in an automatic sampler?  
What is the minimum amount of sample to be collected each time a sample is activated?  
What are the requirements for a sampler?  
How do you determine the size of the tube?  
Why is the pumping velocity important in a sampler?  
What is a pre-sample purge and why is it important?  
How do you determine head in an automatic sampler?  
How do you determine sample volume?  
How do you prepare a sampler for cold weather?  
How do you clean automatic samplers?

## **CHAPTER NINE - TROUBLESHOOTING**

What do continuous low or high pH values cause?

How do you protect yourself from vapors and fumes?

What equipment is needed for a spill response?

What are typical BOD values for some known items such as Coca Cola, Skim Milk, Ice Cream and Blood.

What are some things that you should pay attention to during a windshield survey?

## **CHAPTER TEN - SAMPLING PRACTICAL**

N/A

## **CHAPTER ELEVEN – REFERENCE MATERIAL**

Be able to recognize acronyms

Be able to define: Aliquot, Approval Authority, BOD, COC, Chronic, CWA, Composite Sample, Control Authority, Conventional Pollutants, Effluent, Flow Proportional Composite Sample, Grab Sample, NPDES, POTW, Quality Assurance, Representative Sample, SSO, SUO, SIU, and Time Proportional Composite Samples