SCIENTIFIC CONTROL LABORATORIES, INC.
TESTING • CONSULTING

SUMMARY OF CLASS K WASTEWATER TREATMENT TRAINING COURSE

This course provides wastewater treatment operators with the knowledge necessary to operate a metal finishing wastewater treatment system properly. This course covers the topics listed below. Each topic takes approximately one (1) hour to lecture:

Basic Principles in Chemistry for Wastewater Treatment:
In performing wastewater treatment of effluents from industrial operations, we use several different chemical reactions including oxidation, reduction, neutralization (acid-base reactions), and precipitation (formation of an insoluble compound). Knowledge of the chemical principles that determine the results of these reactions is essential if we wish to operate the treatment system at peak efficiency and avoid treatment problems that may result in a discharge violation.

Basic Mathematics for Wastewater Operators:
Being able to calculate flow rates, chemical addition feed rates, and tank capacities is an important function of being an operator. This section provides a basic math review and skills needed to set up proper calculations.

Introduction to Wastewater Treatment Surface Finishers
While there are cases where compliance was achieved by simply routing "everything" into a tank and then treating it after it was filled, such cases are the exception, not the rule. It is highly desirable to segregate streams and treat them separately to avoid chemical unions that work counter to your desires, to improve the safety of waste treatment workers, and to make waste treatment more efficient. In this lecture we give useful information on the basic monitoring devices and hardware needed for successful wastewater treatment.

Treatment of Cyanide Bearing and Hexavalent Chromium Bearing Wastes (optional):
Cyanide and chromium-bearing wastestreams need special pretreatment before the metals can be precipitated. Cyanide complexes need to be oxidized and hexavalent chromium wastestreams need to be reduced. This lecture covers these oxidization/reduction reactions.

Advanced Methods of Treatment for Metals / Oily Wastes:
This section provides information on the principles of metals precipitation using various reagents, as well as "special treatments for chelated wastestreams from electroless plating operations. Oil separation is also discussed in this lecture.

Solid - Liquid Separation:
Following pre-treatment, the formation of insoluble metallic compounds, the precipitated metals usually form a so-called floc, which is a voluminous solid particle with a specific density very close to that of water, and which therefore tends to float in the water. Various types of clarification are discussed in this lecture including gravity, lamella and dissolved air flotation settling.

Trouble-shooting Wastewater Treatment Systems:
Because of the high frequency of waste treatment systems malfunctioning and the serious consequences, it is important that operators have a plan for discovering quickly the cause of a malfunction and for correcting it quickly. This lecture material is general in nature and should be studied and rewritten into a tailor-made manual for each specific waste treatment system.

Safety Considerations
Following safe work practices is essential in wastewater treatment. This lecture covers basic OSHA requirements such as Hazard Communication, Confined Space Entry, Personal Protective Equipment, and Lockout/Tagout.

Wastewater Exam Review and Study Guide
At the end of the day, students will review the study guide, and have an opportunity to take a "mock" Class K Exam.

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