

CHAPTER V

RECORDS

## CHAPTER V

### RECORDS

#### A. PROCESS OPERATIONS

##### 1. Daily Operating Log

The daily operating log is a tabulation of various items which enable the plant operator to keep accurate daily records of the entire treatment process of plant operation.

There is an area designated for remarks and signature of the plant operator responsible for the report.

A sample daily operating log is provided in this Chapter.

The following are descriptions of the items included in the daily operating log: (Items requiring laboratory tests are thoroughly explained in Chapter IV - Laboratory).

##### a. Wastewater Flow

The total raw wastewater entering the treatment plant must be recorded. This record is obtained from the flow charts located in the console in the laboratory; expressed in MGD.

##### b. Wastewater Temperature

The temperature is taken by submerging a thermometer in the liquid and making a direct reading expressed in degrees centigrade (°C).

##### c. Dissolved Oxygen

Dissolved oxygen represents the amount of oxygen in solution (dissolved) in a liquid expressed in mg/l. Lab tests are suggested to obtain these records. The dissolved oxygen meter will give a quick result but will not be as accurate as performing the D.O. test.

##### d. pH

pH is a term used to express the intensity of an acid or alkaline condition of a solution. The pH meters used to record some of the points of testing are located in the console. Other points must be recorded by the use of a portable pH meter.

##### e. Acidity

Liquids containing acidity are those which generally have a pH of less than 7.0. This analysis is done in the laboratory and is expressed in mg/l as CaCO<sub>3</sub>.

f. Alkalinity

Liquids containing alkalinity are those which generally have a pH of more than 7.0. This analysis is done in the laboratory and is expressed in mg/l as CaCO<sub>3</sub>.

g. Settleable Solids

Settleable solids refer to solids in suspension that will settle under quiescent conditions. This record is expressed in ml/l and requires laboratory testing.

h. Sulfates

Sulfates will be found in a compound form and must be analyzed in the laboratory to acquire the amount of sulfate in the sample. The results are expressed in mg/l.

i. Iron

Iron will be bound with another chemical to form a compound. The iron concentration can be determined by laboratory analysis and expressed in mg/l.

j. Chlorine

Chlorine residual is the chlorine remaining in wastewater at the end of a specified contact period measured in mg/l. A laboratory test is required.

k. Weather

Weather conditions such as fair, cloudy, rain, or snow should be recorded each day.

l. Temperature

The atmospheric temperature should be measured each day in degrees Fahrenheit (°F). Liquid temperatures should be in °C.

m. Sludge Removal

Records must show the amount of sludge removed daily. This is easily measured by adding the total of all the waste sludge totalizers. This entry should be expressed in MGD.

2. Other

In addition to the daily operating log the plant operator should maintain a separate record-keeping system of daily items not included on the daily operating log. These items may include the items listed below. The operator may choose to insert these items in the "remarks" of the daily operating log.

a. Complaints Received

Complaints received, such as odors, nuisance conditions, are to be recorded. Who complains and where the condition came from, and how to overcome these conditions should also be recorded.

b. Plant Visitors

Record characteristics of the plant visitors such as what kind of group, persons, from where, what purpose, what time, how many should be identified and recorded.

c. Power Consumption

The daily power consumption for the entire plant should be recorded. The power unit is expressed in Kilowatt hours.

d. Chemicals Used

The daily chemical consumption of lime must be estimated and reported in pounds or tons used each day. Estimate from lime feeder setting.

e. Unusual Conditions

Unusual conditions such as floods, ice formations, unusual storms which result in difficulties in the plant operation should be recorded. Under these conditions, the damage if any, related to the equipment, and unit process are also to be recorded. The cause of the unusual conditions, if known, are also noted.

f. Routine Operational Duties

Routine operational duties such as care of equipment, maintenance of buildings, care of ground, laboratory analysis etc. must be recorded.

B. LABORATORY

When laboratory tests are made, it is essential that not only the final results of each test be recorded on the daily operating log, but also the working data, readings and all the necessary computations be noted and attached to the daily operating log for future reference. Information on the laboratory worksheet shall include the following:

- i. A summary of all laboratory tests run.
- ii. Computation sheets for the test results.
- iii. Chemicals used.
- iv. Weather conditions such as temperature, precipitation, etc.

Certain laboratory records are required on a daily basis, weekly basis, and/or monthly basis.

## C. MAINTENANCE

Maintenance must be carried out in a manner which prevents emergencies or unscheduled shutdowns. All maintenance requires considerable skill, which can only be acquired by experience, study and practice. Basically, any maintenance program must start with good housekeeping and must observe the following rules:

- i. Keep a clean, neat and orderly plant.
- ii. Establish a systematic (both inside and outside) plan for execution of daily operation.
- iii. Establish a routine schedule for inspection and lubrication.
- iv. Keep data and records of each piece of equipment with emphasis on unusual incidents and faulty operating conditions.
- v. Observe safety measures.

The key to good maintenance is good records. Records are to be kept on cards, one card for each piece of equipment. On these cards must be kept a record of regular periodic lubrication, inspections, cleaning and replacement of worn parts and other data which is felt of importance to record. The date when the next regular servicing of the equipment should occur must appear where it can be easily seen.

## D. OPERATING COSTS AND RECORDS

The major categories of operating costs are labor, utilities, chemicals and supplies. Labor includes operation, administration, and maintenance. Utilities include electricity, fuel oil, telephone and potable water. "Chemicals" is limited to lime used or other chemicals used for emergency operations. Supplies include laboratory chemicals, cleaning materials, maintenance supplies and other expendable items.

The following are the major costs and record keeping procedure for each group.

### 1. Labor

#### a. Operation

Salaries of all the operating personnel such as plant operator and assistant operator, must be recorded every month and summarized once a year.

#### b. Administration

Expenses of all the administrative and clerical functions must be recorded with regard to the plant operation. Records should be prepared monthly and summarized annually.

c. Maintenance

Expenses of any additional personnel required for preventive or corrective maintenance must be recorded on the basis of actual man-hours spent on the job. Records must be summarized every month and once a year.

2. Utilities

a. Electricity

Electricity costs must include information on unit cost (cents/kilowatts per hour), monthly total cost and quantities of kilowatt hours used per month. The costs must be summarized once a year.

b. Potable Water

Expense for water consumption must include information on unit cost (cents/gallon), monthly total cost, and the quantity of water used per month. The record must also be summarized once a year.

c. Telephone

Telephone expenses must be recorded and kept on the basis of total monthly cost and total annual cost.

d. Fuel Oil

The fuel oil expense record must include unit cost (cents/gallon), total quantity used per month, and the total cost per month. The record should be summarized once a year.

3. Chemicals

a. Lime

The operating cost of lime used must be recorded on the basis of the quantity of chemical used in pounds or tons per month or day, the unit cost in dollars per pound or ton, and total monthly cost. Total monthly costs must be compiled once a year.

4. Supplies

a. Laboratory chemicals

The type of chemicals, quantity of chemicals, unit costs, total costs per month and year must be recorded.

b. Cleaning Materials

The type of materials and quantity, unit cost, total cost per month and year must be recorded.

c. Maintenance Materials

The name of the material used for preventive maintenance and corrective maintenance, the quantity of the material, unit cost, and total monthly cost and summarized yearly cost must be recorded.

E. EMERGENCY

When abnormal conditions arise to restrict normal operation of the treatment system a record of these conditions are necessary and must be maintained at the plant. These records must be kept in a notebook specifically prepared for that purpose. These emergency conditions require a detailed report including a complete description of each type of emergency situation. These emergency situations are classified in the following categories:

a. By-pass reports

A by-pass report becomes necessary when the treatment plant influent is not subjected to the treatment process. This may occur during breakdowns of units, tanks, etc. or should a raw water force main break. This report is required by D.E.R.

b. Deteriorated effluent records

This situation pertains to the plant effluent. It is recorded when the effluent does not meet the admissible limitations outlined in the permit requirements.

c. Accidental Spills

This occurs when certain wastes are discharged into the system that the treatment plant is not capable of handling and/or will impair the treatment process. Ex. oil, excess lime slurry, short circuiting clarifier, etc.

All emergency condition records must take into consideration but are not limited to the following items.

- i. Date of occurrence
- ii. Cause
- iii. Time
- iv. Approximate flow (gallons) involved
- v. Quality of effluent
- vi. Remedial measures taken

F. FORMS

The next several pages contain sample forms which may be used to keep permanent records of the conditions outlined in this Chapter.

- Figure 1 Laboratory Testing Program
- Figure 2 Daily Operating Log
- Figure 3 Monthly Report Form

Figure 4	Annual Report Form
Figure 5	Equipment Data Card (Side 1)
Figure 6	Preventive Maintenance Card (Side 2)
Figure 7	Preventive Maintenance Card (Side 1)
Figure 8	Corrective Maintenance Card (Side 2)
Figure 9	NPDES Discharge Monitoring Report
Figure 10	Confined Space Entry
Figure 11	Spill Report



CHAPTER V  
 FIGURE I  
 SAMPLE LABORATORY TESTING PROGRAM

	STREAM-ABOVE PLANT	STREAM-BELOW PLANT	RAW WATER INFLUENT CHANNEL	FLASH MIXER EFFLUENT	AERATION TANK EFFLUENT (1)	SETTLING TANK EFFLUENT	FINAL TANK EFFLUENT	WASTE SLUDGE WELL	POTABLE WATER SUPPLY (IF USED FOR SLURRY)	CHLORINE TANK EFFLUENT (DOMESTIC SEWAGE PLANT)(2)
TEMPERATURE	G D	G D	G D			G D	G W			
DISSOLVED OXYGEN	G W	G W	G W		G G F	G D	G W			
pH	G W	G W	G D	G D	G G F	G D	G W			
ACIDITY - TOTAL *	G W	G W	G D		G G F	G D	G W			
ACIDITY - FREE *	G W	G W	G D		G G F	G D	G W			
ALKALINITY - TOTAL *	G W	G W	G D		G G F	G D	G W			
ALKALINITY - NET *	G W	G W	G D		G G F	G D	G W			
TURBIDITY			G W				G W			
TOTAL DISSOLVED SOLIDS			G W				G W	G W		
SETTLABLE SOLIDS			G D	G D	G F	G D	G W	G W		
CHLORIDE							G M			
SILICA			G M				G M		G F	
SULFATES			G D				G W	G W	G F	
ALUMINUM	G M	G M	G M				G M			
IRON - TOTAL & DISSOLVED	G W	G W	G D				G W	G W	G F	
IRON - FERROUS	G W	G W	G D				G W	G W	G F	
IRON - FERRIC	G W	G W	G D				G W	G W	G F	
MANGANESE	G M	G M	G M				G M			
CHLORINE - TOTAL AVAILABLE										G D

\* AS CaCO<sub>2</sub>

LEGEND

TYPE OF SAMPLE      FREQUENCY  
 C - COMPOSITE      D - DAILY  
 G - GRAB SAMPLE    W - WEEKLY  
                                  M - MONTHLY  
                                  F - FREQUENTLY



- (1) DONE AS FREQUENT AS POSSIBLE AS TIME PERMITS.
- (2) COMPOSITE SAMPLE (8 hr.) AS OFTEN AS POSSIBLE.

CHAPTER V  
FIGURE 2

SAMPLE DAILY OPERATING LOG

ERNEST  
ACID MINE DRAINAGE TREATMENT PLANT

OPERATION REPORT

WEEK ENDING \_\_\_\_\_

		SUN	MON	TUE	WED	THU	FRI	SAT
Wastewater Flow	Flume 1							
	Flume 2							
	Total							
Wastewater Temp.	Raw							
	Settling							
	Stream							
Dissolved Oxygen	Stream							
	Aeration							
	Final							
pH	Raw							
	Mixer							
	Aeration							
	Settling							
	Final							
Acidity-Total	Raw							
	Aeration							
	Final							
Acidity-Free	Raw							
	Aeration							
	Final							
Alkalinity-Total	Raw							
	Aeration							
	Final							
Alkalinity-Net	Raw							
	Aeration							
	Final							
Settleable Solids	Raw							
	Mixer							
	Aeration							
	Settling							
	Final							
	Sludge							
Sulfates	Raw							
	Final							
	Sludge							
Iron-Total	Raw							
	Final							
	Waste							
Iron-Ferrous	Raw							
	Final							
	Waste							
Iron-Ferric	Raw							
	Final							
	Waste							
Chlorine	Final							

Remarks: \_\_\_\_\_

Operators Signature \_\_\_\_\_

CHAPTER V  
**FIGURE 3**  
**SAMPLE MONTHLY REPORT OF OPERATION**

**ERNEST**  
**ACID MINE DRAINAGE TREATMENT PLANT**

FOR MONTH

DATE	FLOW (M.G.D.)	IRON-TOTAL mg/l		SULFATES mg/l		SETTLEABLE SOLIDS mg/l		pH		WASTED SLUDGE	REMARKS
	TOT.	RAW	FINAL	RAW	FINAL	RAW	FINAL	RAW	FINAL	(M.G.D.)	
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											
31											
TOT.											
AVG.											
MAX.											
MIN.											

OPERATORS SIGNATURE

CHAPTER V  
FIGURE 4

SAMPLE ANNUAL REPORT

Average Daily Flow (MGD)	_____
Average pH	_____
Influent	_____
Effluent	_____
Average Settleable Solids	_____
Influent	_____
Effluent	_____
Average Sulfates	_____
Influent	_____
Effluent	_____
Average Iron - Total	_____
Influent	_____
Effluent	_____
Average Wasted Sludge (MGD)	_____
Average Wasted Sludge Iron	_____
Average Wasted Sludge Sulfates	_____
Expendable items used	_____
Average Wasted Sludge Settleable Solids	_____
Average Lime Used (tons per day)	_____
(tons per year)	_____
(Cost per day)	_____
(Cost per year)	_____
Average Power Used (KWH per day)	_____
(KWH per year)	_____
(Cost per day)	_____
(Cost per year)	_____

SAMPLE EQUIPMENT DATA CARD

NAME OF EQUIPMENT ITEM: \_\_\_\_\_ INVENTORY NUMBER: \_\_\_\_\_

MODEL NUMBER: \_\_\_\_\_ SERIAL NUMBER: \_\_\_\_\_ SIZE: \_\_\_\_\_

MANUFACTURES NAME AND ADDRESS: \_\_\_\_\_

PURCHASER'S NAME, ADDRESS AND TELEPHONE: \_\_\_\_\_

DATE PURCHASED: \_\_\_\_\_ PURCHASE PRICE: \_\_\_\_\_

EQUIPMENT DATA : \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

MAINTENANCE ITEMS ON HAND

ITEM

QUANTITY

PART

SPARE PARTS ON HAND

QUANTITY

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_









CHAPTER V  
FIGURE 9

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM  
DISCHARGE MONITORING REPORT

Form Approved  
OMB NO 151-R0073

INSTRUCTIONS

1. Provide dates for period covered by this report in spaces marked "REPORTING PERIOD".
2. Enter reported minimum, average and maximum values under "QUANTITY" and "CONCENTRATION" in the units specified for each parameter as appropriate. Do not enter values in boxes containing asterisks. "AVERAGE" is average computed over actual time discharge is operating. "MAXIMUM" and "MINIMUM" are extreme values observed during the reporting period.
3. Specify the number of analyzed samples that exceed the maximum (and/or minimum as appropriate) permit conditions in the columns labeled "No. Ex." If none, enter "0".
4. Specify frequency of analysis for each parameter as No. analyses/No. days. (e.g. "3/7" is equivalent to 3 analyses performed every 7 days.) If continuous, enter "CONT." If frequency was continuous, enter "NA".
5. Specify sample type ("grab" or "— hr. composite") as applicable.
6. Appropriate signature is required on bottom of this form.
7. Remove carbon and retain copy for your records.
8. Fold along dotted lines, staple and mail Original to office specified in permit.

(12-11) ST	(14-10) PERMIT NUMBER	(17-19) DIS	(18-20) SIC
(20-21) YEAR	(22-23) MO	(24-25) DAY	(26-27) YEAR
(28-29) MO	(30-31) DAY	(32-33) YEAR	(34-35) DAY

(28-29) TO (32-33)

REPORTING PERIOD: FROM

PARAMETER	(3 card only) (28-45)			(4 card only) (38-48)			CONCENTRATION (46-54)			FREQUENCY OF ANALYSIS	SAMPLE TYPE	
	MINIMUM	AVERAGE	NO. EX	MINIMUM	AVERAGE	MAXIMUM	MINIMUM	AVERAGE	MAXIMUM			UNITS
REPORTED												
PERMIT CONDITION												
REPORTED												
PERMIT CONDITION												
REPORTED												
PERMIT CONDITION												
REPORTED												
PERMIT CONDITION												
REPORTED												
PERMIT CONDITION												
REPORTED												
PERMIT CONDITION												

(132-37) (164-88) (88-77)

NAME OF PRINCIPAL EXECUTIVE OFFICER	TITLE OF THE OFFICER	DATE
I certify that I am familiar with the information contained in this report and that to the best of my knowledge and belief such information is true, complete, and accurate.		
SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER		

CHAPTER V

FIGURE 10

SAMPLE CONFINED SPACE ENTRY PERMIT FORM

CONFINED SPACE ENTRY PERMIT

DATE: \_\_\_\_\_  
 Area or Equipment to be entered: \_\_\_\_\_  
 Location: \_\_\_\_\_  
 Purpose of entry: \_\_\_\_\_  
 Testing instrument(s) used: \_\_\_\_\_  
 Ventilation equipment used: \_\_\_\_\_  
 Safety and Rescue equipment provided: \_\_\_\_\_

Periodic Checks	Time	Oxygen Per Cent	% Reading	Tested by	Comment
Prior to Entry  1. 2. 3. 4. 5. 6. 7. 8.					

This confined space has been inspected and found safe for entry for the period covered.

Signed: \_\_\_\_\_ (Person in Charge) \_\_\_\_\_ (Date) \_\_\_\_\_ (Time)

CHAPTER V

FIGURE II

SAMPLE WASTEWATER SPILL REPORT

NAME OF REPORTING AGENCY \_\_\_\_\_

ADDRESS \_\_\_\_\_

LOCATION OF SPILL \_\_\_\_\_

DATE SPILL STARTED \_\_\_\_\_ VOLUME OF SPILL \_\_\_\_\_ (GPM)

TIME SPILL STARTED \_\_\_\_\_ SPILL WAS CHLORINATED \_\_\_\_\_ YES

DATE SPILL STOPPED \_\_\_\_\_ TIME SPILL STOPPED \_\_\_\_\_ NO

CAUSE OF SPILL \_\_\_\_\_ TYPE OF SPILL \_\_\_\_\_

REMEDIAL ACTION TAKEN \_\_\_\_\_

REMARKS : \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Written Report By \_\_\_\_\_

Title \_\_\_\_\_

Telephone \_\_\_\_\_