

Environmental Auditing

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Abstract- The environmental audit help in pollution control. Improved production safety and health and conservation of natural resources and hence its overall objective can be stated as achieving sustainable development. However for conducting environmental audit objectives are to be defined clearly or else the audit procedure will be subject to varying interpretations which may yield and contribute to differences in approach thereby influencing the end results. The objectives of environmental audit in an industry are (i) To determine the mass balance of various materials used and the performance of various process equipment so as to identify usage of materials in excess than required. To review the conversion efficiencies of process equipment and accordingly fix up norms for equipment/operation performance and minimization of the wastes. (ii) (a) To identify the areas of water usage and wastewater generation and determine the characteristics of wastewater..[3]

Keywords –Environmental Auditing

I. INTRODUCTION

1.1 Philosophy Of Environmental Auditing

1.1.1 Definition

Environmental auditing is management tool comprising systematic, documented periodic & objective evaluation of how well the management systems are performing with the aim aim of

- (i) Waste prevention and reduction.
- (ii) Assessing compliance with regulatory requirements.
- (iii) Facilitating control of environmental practices by a company's management.
- (iv) Placing, environmental information in public domain.

In the industries especially the chemical industries, raw materials are used in excess of the stoichiometric requirements because of the limitations on practically achievable operational efficiencies and the raw materials purity. These excess usages of raw materials unless recovered find their way to environment causing pollution. Wastes from an industry include non-product discharges in gaseous, liquid and solid phases. End -of-the-pipe waste treatment techniques, where in all the wastes are carried to a common facility for treatment is proving to be ineffective and uneconomical due to the complexity of problems associated with waste generation, their quantity and characteristics. The waste generation may vary hourly, daily and seasonally especially in case of the multiplicity of manufacturing product in the same premises. The wastewater characteristics also widely vary from stream to stream discharged from various unit operations of a particular product. In this growing complexity of problems, the concept of waste prevention implementation within a reasonable time frame keeping in view the financial and other considerations of a company. In cases of gaps for compliance with the regulatory requirements the regulatory bodies could be apprised of these action plans and time obtained for implementation. Thus the regulatory risk en and reduction can work out to be more effective. It is important to find out whether an industry is complying with environmental standards and other regulatory requirements. It is also very essential to periodically monitor this aspect, determine the gaps and workout action plans for could be overcome and effective steps taken for pollution control. [3]

1.1.2 Objectives of Environmental Audit

The environmental audit help in pollution control. Improved production safety and health and conservation of natural resources and hence its overall objective can be stated as achieving sustainable development. However for conducting environmental audit objectives are to be defined clearly or else the audit procedure will be subject to varying interpretations which may yield and contribute to differences in approach thereby influencing the end results. The objectives of environmental audit in an industry are

- (i) To determine the mass balance of various materials used and the performance of various process equipment so as to identify usage of materials in excess than required. To review the conversion efficiencies of process equipment and accordingly fix up norms for equipment/operation performance and minimization of the wastes.

- (ii) (a) To identify the areas of water usage and wastewater generation and determine the characteristics of wastewater.
- (b) To determine the emissions, their sources, quantities and characteristics.
- (c) To determine the solid wastes and hazardous wastes generated, their sources, quantities characteristics.
- (iii) To identify the possibilities of waste minimization, recovery and recycling of wastes.
- (iv) To determine the performance of the existing waste treatment control systems so as to modify or install additional or alternative control equipment accordingly.
- (v) To determine the impact on the surrounding environment (groundwater, stream, residential area, agricultural area, sensitive zone) due to the disposal of wastewater, emissions and solid wastes from the industry and accordingly identify suitable preventive measures, if necessary.
- (vi) To verify compliance with the standards and conditions prescribed by the regulatory bodies under the Water Act, Air Act and the Environmental Protection Act.
- (vii) To check the effectiveness of
 - (a) organizational set up of the industry for decision making and environmental management with special reference to their technical view point, attitudinal view point.
 - (b) Environmental policy of company.[3]

1.1.3 Benefits of Environmental Audit

Environmental auditing has far reaching benefits to the industry, to the society and the nation at large. The benefits of environmental audit are

- (i) Determines how well the process systems and pollution control systems are performing and identifies the operations of poor performance.
- (ii) Identifies potential cost savings which can be accrued through reduction in raw material consumption by way of waste minimization and adoption of recycle/recovery reduction in pollution load.
- (iii) Increases awareness of environmental requirements policies and responsibilities.
- (iv) Helps in understanding the technical capabilities and attitude of the environmental organization in a company,
- (v) Provides upto date environmental data base for use in plant modification emergencies
- (vi) Unravels surprises and hidden liabilities due to which regulatory risk and exposure to litigation can be reduced.
- (vii) Ensures independent verification, identifies matters needing attention and provides timely warning to management on potential future problems.
- (viii) Helps to safeguard environment and assists in complying with local regional and national laws and regulations, with the company's policy and with the environmental standard

2.1 Environmental Audit: Indian Scenario

Industrial pollution in our country is on increase and is creating a high risk environment. Various legislations/viz, The water (Prevention & Control of pollution) Act 1974, the Air (Prevention & Control of Pollution) Act 1981 and the Environment Protection Act 1986 have come into force and organizations created to combat pollution. Gone are the days when industrialization meant profit-making and environment was grossly neglected. It is being realized that industry and environment should go hand in hand so as to achieve sustainable development. Also over the years awareness has brought in realization to consider environmental protection a bare necessity. Yet, the investments for such a protection are still considered a liability by many industrialists mainly due to lack of up-to-date scientific practices of environmental factors at par with production helps in minimizing material losses and also in reduction of liabilities in the long run. The growing environmental pollution and the complexity of this problem with increasing risks from the regulatory controls needs an effective management tool so as to prevent pollution and to make pollution control programmes cost effective and feasible.

Environmental audit is a technique being introduced for integrating the interest of the industry and the environment so that these could be mutually supportive. This technique is basically a part of industry's internal procedures in meeting their responsibilities towards better environment. Also the policy statement for abatement of pollution by the Government of India provides for submission of environmental statement by all concerned industries, which would subsequently evolve into an environmental audit. A notification under the Environment (Protection) Rules, 1986 has been issued on April 22, 1993, requiring industries to submit an environmental statement for the financial year ending on March 31 in Form V to the concerned State pollution Control Boards on or before September 30 every year beginning 1993. The Department of Company Affairs also agreed to include this requirement as a part of

the Director’s Annual Report. The submission of an environmental statement is applicable to the following (i) Those who require consent under the Water(Prevention&Control of Pollution Act 1974 (ii)Those who require consent under the Air (Prevention & Control of Pollution) Act 1981. (iii)Those who require authorization under Hazardous wastes (Management &Handling) 1989.

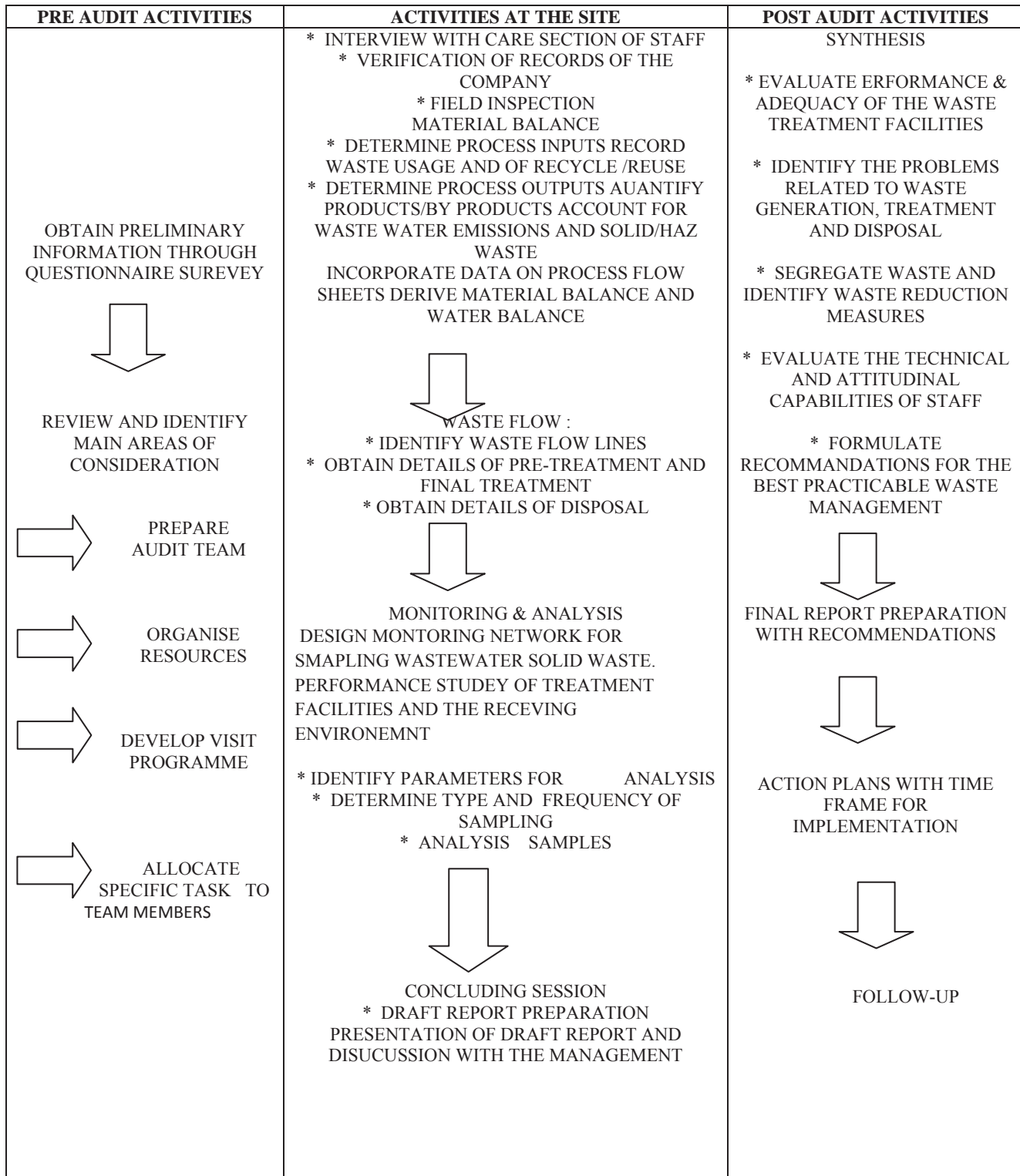


Fig 2.1 Environmental audit procedure

2.2 Environmental audit procedure

The audit procedure includes broadly the following]

- (i)Pre-audit activities.
- (ii)Activities at the site.
- (iii)Post audit activities.

The details of these activities and the entire audit procedure are depicted in figure 2.1.

III. METHODOLOGY

3.1 A typical unit operation of milk industry is given below is depicted in figure 3.1

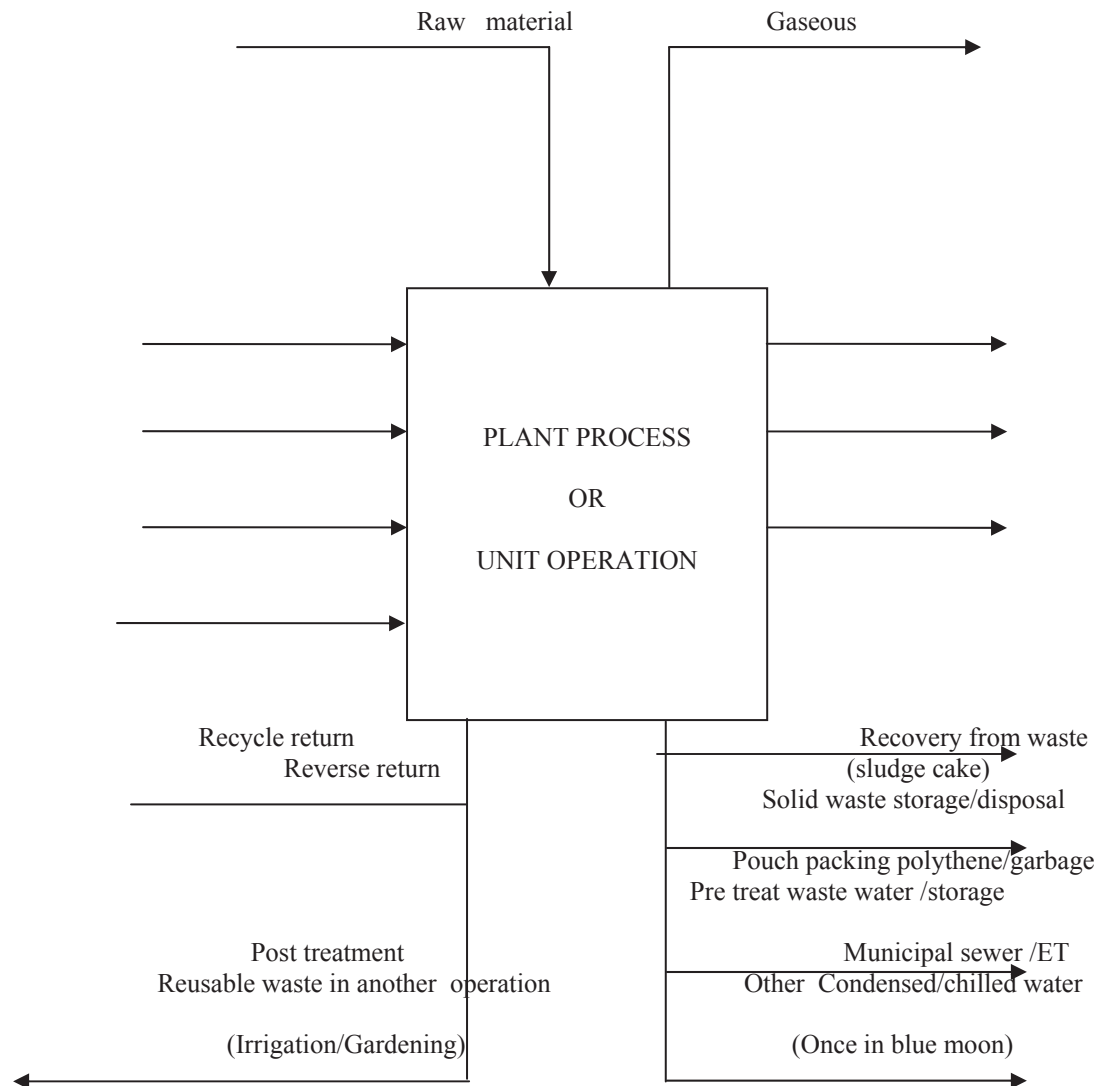


Figure 3.1 Unit operation

IV. RESULTS & DISCUSSIONS

- 4.1 Make auditing of material used, different exhaust, solid waste etc
- 4.2: Ground water characteristics & waste water characteristics should be included in the report
- 4.3 Figures showing in variation of characteristics should be drawn
- 4.4 Characteristics of each treatment units and efficiency of each treatment unit should be done separately.

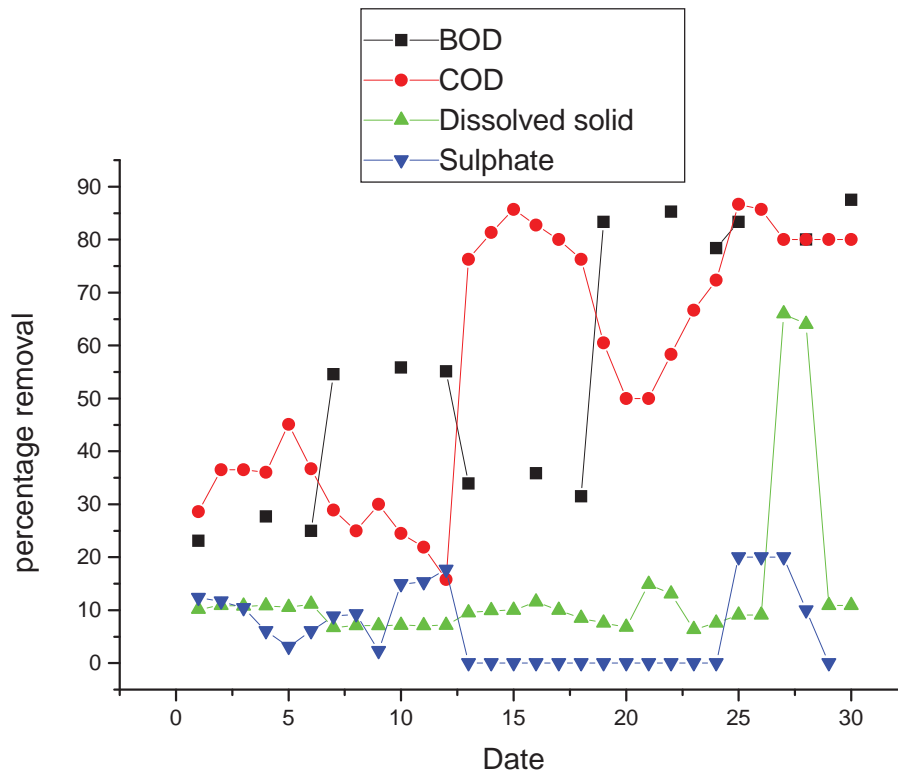


Figure 4.1 Efficiency against characteristics

V. CONCLUSIONS

- (1) Correlation coefficient between the analyzed parameters has to be find out.
- (2) Positive relationship between any substance for ground water&waste water has to be observed considering the limit+0.67&(-0.67) also.
- (3) Efficiency of each unit should be calculated seperately.
- (4) Condensate water, cooling water, make upwater, boiler expansion tank water are initially softened and necessary to recycle
- (5) The variation in effluent characaterstics can be studied by varying the temperature of influent.
- (6) The influent flow rate can be varied to check the changes in performance.
- (7) Rate of flow to aeration tanks in the ETP should be kept constant to avoid shock loads.
- (8) Transfer of materials should be done through closed operations.
- (9) Evaporation losses from storage tanks should be checked by proper insulation and putting the suitable dip columns.
- (10) Water consumption is looking high,cleaner technology scenario needed to study.

REFERENCES

- [1] Racunsko Sodise., (1995) : What is environmental auditing ,court of audit of the Republic of Slovenia, Republic of Slovenia state institution:1-20
- [2] Racunsko Sodisce.,(1995) : Why is environmental auditing important, court of audit the Republic of Slovenia state -institutions :1-20
- [3] D.D. Basu., (1993) : Guide lines for environmental auditing , Central pollution control board : 1-80
- [4] [http://www.ifc.org/ifcext/enviro.nsf/content/ Environmental Guidelines](http://www.ifc.org/ifcext/enviro.nsf/content/Environmental%20Guidelines)
- [5] <http://webcache.googleusercontent.com/search?hl=bo=1&q=cache:DmgNdIIIq2g>
- [6] D.D. Basu ,Shri N Raghu Babu ., (1992) :Environmental audit at M/s Nocil Agrochemicals plant Lote parshuram Maharshtra, Central pollution board :1-71
- [7] Bureau of Indian standards., Manak Bhavan , 9 Bahadur Shah Zafar marg New Delhi :1-9