

Environmental Audits in Industrial Projects

An environmental audit is a process for assessing the nature and extent of environmental concerns at an existing facility—an industrial plant, an abandoned site, a mine area, or any other site where industrial pollution problems are identified or anticipated. It is used to provide data on the extent of pollution in an industrial area, to quantify the scale of pollution at a particular site, or to examine the causes and potential remedies of problems at a facility. This chapter provides guidance on the uses of environmental audits in industrial pollution management and on the scope of a typical audit.

Types of Environmental Audit

The term *environmental audit* covers a wide range of activities based on formal evaluation of an organization's or a facility's performance in relation to environmental objectives. There are many different definitions reflecting different emphases and objectives, but the critical elements are that the audit should be objective, systematic and based on defined criteria. (For a broader discussion of environmental audits, see the World Bank's Environmental Assessment Sourcebook Update series.) Several broad categories of audit can be defined (see Box 1), but this chapter focuses on the use of environmental audits in World Bank industrial pollution management activities. In these cases, the principal objective is to collect factual information about the extent and causes of pollution at a site or facility and possible remedial actions. In some IFC projects, a project-specific environmental audit is used as part of the formal environmental analysis and review process, and particular requirements apply. (For details, contact the Environment Division at the IFC.) Clearly, it is important that the scope and objectives of an audit be clearly defined.

Use of Site Audits

A site audit is often the first step in obtaining a quantitative understanding of pollution problems. In many cases, the audit allows an evalua-

Box 1. Types of Environmental Audit

Several types of environmental audit can be distinguished, although with considerable overlap:

- *Site audit*: assesses onsite conditions and the extent of contamination problems
- *Liability audit*: requested by potential purchasers or by financial institutions when considering investment or acquisition
- *Compliance audit*: addresses compliance with company policies and regulatory requirements
- *Management system audit*: reviews both technical and organizational aspects, usually within the context of corporate environmental strategy
- *Waste minimization or pollution prevention audit*: examines production and waste management systems to identify improvements

tion to be made of priorities and of the extent and cost of control and remediation measures. This information then shapes all remediation actions and investments. Some examples of the use of site audits in Bank projects are given in Box 2.

Role in Environmental Assessment

An environmental audit can, in certain circumstances, meet most of the World Bank's or the IFC's environmental assessment requirements for a Category B project. (A project in which

Box 2. Uses of Site Audits in Bank Projects

- In *Bulgaria*, an audit provided information on the extent and severity of contamination at a metal smelter.
- In *Bolivia*, audits were used to define environmental issues and provide a basis for discussions with potential investors in the mining and hydrocarbons sectors.
- In *Algeria*, audits were carried out on several major industries in the preparation of an industrial pollution management project.
- In *Estonia*, the IFC's preparation for investment in a cement plant included a detailed audit that provided the basis for an environmental management plan.

significant retrofitting or upgrading of industrial plant is being considered would normally be classified as Category B). For such a project, an environmental audit should be carried out as part of the preparation for the upgrading, and this audit can provide the main documentation necessary for the environmental assessment. (All other relevant requirements of OP 4.01 must also be taken into consideration, particularly in relation to consultation, which is not usually part of the audit.)

Scope and Level of Detail

In an industrial context, the overall objective is to understand the scale and sources of the pollution problems at a facility or in a defined area and to set out the options available for dealing with those problems. There is often a staged process of investigation in which each stage is narrower in scope but more detailed than the preceding one.

An initial assessment can be relatively quick, drawing on readily available sources, including site interviews, and providing an overview of the actual or suspected sources of pollutants and the extent of their impact. This overview can be carried out during project definition or as a scoping stage and provides a basis for further detailed investigations or for defining priorities for action.

A useful function of the initial assessment is to describe data availability and needs and to indicate where site sampling and monitoring might be cost-effective.

Extent of Coverage

A key difference between a plant environmental audit and a full site audit is that the coverage of the audit should be wide enough to include the areas affected by the plant so that the benefits of improvements in operations can be estimated. Detail may be lacking, but it is important to indicate the extent of offsite impacts, where these occur.

Full Audit

A full site audit is detailed, requiring careful site inspections (perhaps including sampling and testing) and review of past and present production processes, as well as pollution emissions and control measures. The audit should also clarify the legal and regulatory framework, licensing agreements, corporate policies, and management structures and priorities that affect the environmental performance of the plant.

In many cases, relevant technical and environmental standards for performance may be ill defined or may not exist, and professional judgments will have to be made as to the appropriate benchmarks. However, it is essential that the standards or emissions limits proposed for the plant be clearly defined and that the rationale for their selection be given. If full new plant requirements appear unachievable with the current plant, the audit should address what might be acceptable as realistic interim requirements.

Recommendations for Action

The audit should provide a list of recommended actions, in terms of increasing cost-effectiveness in addressing the critical environmental issues. This list should include interim and long-term targets and a timetable for achieving them, together with an indication of the investments and other resources (human, information, and so on) that would be required.

Scale and Cost

The scale and cost of site audits can vary widely, depending, above all, on the extent of field data collection required. A scoping study can be carried out in a couple of days by one or two people, with cooperation from site personnel. A full site audit of a typical industrial plant can be carried out within one to two months, of which perhaps one week is spent on the main fieldwork, usually followed by a shorter visit to verify initial findings. Using a typical team comprising local technical staff and a small number of international specialists, budget costs would be of the order of US\$30,000–\$50,000. For a large plant, especially where the area involved is extensive or where there is need for a program of sampling and testing, the costs can rise to US\$200,000–\$400,000. Where the objectives are limited and local expertise is available, a reasonable audit can be carried out for much smaller amounts. It is therefore critical that the objectives and requirements of the audit be clearly stated and justified.

Terms of Reference

The terms of reference (TOR) will be site-specific, but the examples given in Box 3 illustrate what might be included in a comprehensive TOR. Examples of formats for reporting that have been required are shown in Box 4.

Points of Procedure

The following points relate to the procedures for the execution of an audit.

- *Selection of auditors.* Various forms of certification of environmental auditors are under discussion in different countries, but, in general, no formal qualifications or registration should be required for carrying out a site audit.

Although many of the skills required for a site assessment are general environmental or engineering skills, it is important that the audit team contain personnel with detailed knowledge of the specific industry being addressed. Selection of auditors should follow the normal procedures for consultants. Arrangements should be made to

Box 3. Example: TOR for a Mining Area Site Audit

- Overall objective
- Specific objectives
- General scope of work
- Baseline data
- Principal sources of contamination
- Area of impact
- Technical approach
- Work plan
- Prevention, control, and mitigation
- Recommended priority actions
- Environmental management plan
- Site-specific scope of work (by site)
- Laboratory services
- Norms and standards
- Pre-bid site visits
- Client contacts and counterparts
- Facilities provided by the client
- Reporting and deliverables

Box 4. Examples of Audit Report Contents Required in the TOR

For an IFC project

- Executive summary
- Project description
- Regulatory setting
- Audit procedure
- Mitigation
- Costs and schedule
- Annexes

Russian Federation Environmental Management Project

- Executive summary
- Introduction
- The site
- Review of environmental management
- Survey of compliance with environmental laws, regulations, and company policies
- Conclusions and recommendations
- Recommendations for further investigation
- Appendices
- Photolog
- Supporting documentation

allow bidders to become familiar with the site before the tender closure date.

- *Briefing and terms of reference.* It is essential that the consultants selected have a clear understanding of the objectives of the work, especially if it is to become part of the overall environmental assessment for the project. The TOR therefore need to be as specific as possible.
- *Preparation phase.* An *audit plan* should be prepared describing the information required, the site visit schedule, and the site personnel to be involved or interviewed.

A *protocol* may be prepared defining the specific information that will be sought during the site visit. The protocol should be provided to the enterprise well in advance of the visit.

Available file information on the facility should be obtained and reviewed before the visit, and the audit plan should then be refined, if necessary.

- *Execution of the audit.* Active cooperation of the plant owners and managers is essential for a good result and should be secured in advance. Good coordination reduces delays and costs. Therefore site visits, interviews, and any sampling should be organized as early as possible. The site inspection should be carefully documented, to support the findings and recommendations and to provide a reference for future audits.

- *Review of findings.* It is important that the management in place be allowed to comment on the findings and recommendations of the audit.

Other Issues

If the environmental audit is to form part of the environmental assessment process required under OP 4.01, the documents must be made available as part of the public consultation. To avoid disclosure problems, the audit report may have to be written in such a way as to provide the necessary environmental information without disclosing commercially confidential information. In such a case, the task manager must be satisfied that the public report provides sufficient detail to satisfy the EA requirements.

Reference and Source

UNEP (United Nations Environment Programme) and UNIDO (United Nations Industrial Development Organization). 1991. "Audit and Reduction Manual for Industrial Emissions and Wastes." UNEP, Paris, and UNIDO, Vienna.

World Bank. 1995. "Environmental Auditing." Environmental Assessment Sourcebook Update 11. Environment Department, Washington, D.C.