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(Under the department of Science & Technology, Bihar, Patna)

B.Tech 8th Semester Mid-Term Examination, 2019

ENVIRONMENTAL IMPACT ASSESMENT, CIVIL ENGINEERING

Time: 2 hours

Full marks :20

Attempt all questions.

Sample answer

Q1. The main aim of undertaking an EIA for a project is to ensure that the project is planned adequately therefore environmental impacts are minimized. All of this can be achieved by:

(1)Identifying all possible environmental impacts

(2)Evaluating various projects option

(3) Creating appropriate abatement measures

(4)Developing assessment program

Which of the following statements are correct

(a) 1,2 and 4 only (b) 2 ,3,and 4 only (c) 1 and 2 only (d) 2 and 4 only (1x1=1)

Answer :- (d) 1 and 2 only

Q3. Fill in the blanks from the following options (out of 10 only 6 options are correct)

(13 , state, country, cover letter ,12 ,project initiator, 3,headquarters, project head, scoping)

Submission of Preliminary EIA report must contain _____(1) copies of PEIA

report that must be submitted to _____(2) DOE and _____(3) copies to DOE

_____(4). The reports should be accompanied by a _____(5), signed by

_____(6) using Project Initiator's letterhead.

Answer

1) 12

2) state

3) 3

4) headquarters

5) cover letter

6) project initiator (0.5x6=3)

Q 4 A car washing and lubricating company has been operating for several years

(more than 10 yr) in a terrain with the following characteristics: porous, filterable with a freatic level near to the surface (1.5 m depth). The company is located close by to an estuary branch which is quite useful for them since they discharge all the disposals and waste generated by this

activity directly into the estuary. These disposals contain a high level of oils and greases. All the dumping from the car maintenance goes directly into the soil since there are not palettes or gutters. The lubricating company operates for 20hrs for seven days per week. The Municipality since the local people has complained has arranged the execution of an EIA and you are a part of it.

a. Mention three environmental impacts of this activity

Answer:

It has been observed that the various pollutants including the heavy metals and oil and grease build up to very high concentrations in the soil, and thereby seep or percolate into the groundwater, ,thereby posing great hazards to the people that consume the water, and also great hazards to the soil.

Oils have considerable potential to cause environmental damage by virtue of their ability to spread over large areas of land and water.,thereby posing great hazards to the people that consume the water, and also great hazards to the soil.

1)The soil quality becomes compromised, thus posing challenges to groundwater due to seepage during the raining season.

2) This not only affects the human population that depend on such water, but the soil fauna are equally decimated. Most of the heavy metals analysed and the level of their presence can hardly support soil animal life.

3) A film of used/waste oils on a water surface prevents oxygen from entering the water and blocks sunlight. This makes it difficult for plants to photosynthesize and reduces plant and animal life in water body.

b. Mention three mitigation measures you will propose as part of your EMP to mitigate the impacts identified ?

Answer :

(1)Laboratory should be set up with manpower and facilities for self-monitoring of pollutants generated in the company. The laboratory will be equipped with instruments and chemicals required for monitoring following pollution parameters pH, Temp, BOD, SS etc.

(2) Instruction manual should be provided for monitoring of water, solid and gaseous parameter discharged from the company and also of various parameters of pollution control facilities

(3)The effluent shall be treated in well designed effluent treatment plant to achieve the norms prescribed by pollution control board. No effluent will be discharge outside the premises.

Q 5 Write short notes on following terms (any four)

(4x2.5=10)

- (1) EIA (2) Terms of Reference(s) (3) EIS and its types (4)Screening
(5) NEPA (6)Scoping (7) Environmental auditing (8) Impact prediction

(1)EIA – An environmental impact assessment (EIA) is commonly described as an assessment of the impact of planned activities on the environment, including impacts on biodiversity, vegetation and ecology, water, and air.

An EIA can be seen as a process of identifying, predicting, and evaluating the likely environmental, socioeconomic, cultural and other impacts of a proposed project or development to define mitigation actions—not only to reduce negative impacts but also provide positive contributions to the natural environment and well-being.

EIAs are carried out in a wide variety of sectors, including agriculture, manufacturing, tourism, mining and forestry. Projects requiring an EIA can be large, such as a hydroelectric dam, or small, such as a new hotel on a beach. However, the level of impact on human and environmental health—rather than the size of the project—is the most important aspect of decision-making on the need for an EIA.

(2) Terms of Reference(s)-

Once a project or development has gone through the screening and scoping phases, the authority responsible for processing the EIA provides the client with a Terms of Reference (TOR) document. The TOR provides details of all the information required for the EIA review committee to make an informed decision about awarding the Environmental Licence. Depending on the country, TORs may be developed specifically for the project, or they may be a general set of guidelines that apply to all projects in a sector

The TOR should require the consultants to cover the following points:

- 1 The main environmental effects of the proposed project, both in the project area and in the surrounding area and the timescale of the impacts;
- 2 The need for further baseline data collection or other specialist studies;
- 3 The present policy, institutional and legislative situation and future needs;
- 4 The mitigating measures needed and how they should be incorporated into the project design

(3) EIS and its types

An EIS is a detailed written statement which serves as an action-forcing device to ensure that the policies and goals defined in the EPA are infused into the ongoing programs and actions of the central government. It must provide full and fair discussion of significant environmental impacts and must inform decision makers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment.

1. Draft EIS:

The draft EIS is the document prepared by the lead agency proposing an action; it is circulated for review and comment to other concerned agencies, state and local agencies, and public and private interest groups. The agency must make every effort to disclose and discuss at appropriate intervals in the draft statement all major points of view on the environmental impacts of the alternatives, including the proposed action.

2. Final EIS:

The final EIS is the draft EIS modified to include a discussion of problems and objections raised by the reviewers. The final statement must be on file with the EPA for at least a 30-day period prior to initiation of construction on the project.

3. Supplemental EIS:

Lead agencies are to prepare supplements to either draft or final EISs if the agency makes substantial changes in the proposed action that are relevant to environmental concerns; or if there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts. Lead agencies may also prepare supplements when the agency determines that the purposes of the act will be furthered by doing so.

(4) Screening It is the first stage of the EIA process which results in a key EIA decision, namely to either conduct the assessment (based on the likely significant impacts) or not conduct it (in the anticipated absence of such impacts). Screening needs to follow specific procedures often described in the legislation so all the projects follow the same process.

Key contributions of screening to a good EIA:

- Facilitates informed decision making by providing clear, well-structured, factual analysis of the effects and consequences of proposed actions.
- Influences both project selection and policy design by screening out environmentally and/or socially unsound proposals, as well as modifying feasible action.

To determine whether or not the project requires an EIA, project proponents assess their project based upon a set of criteria determined by a designated agency. It is important that screening be done as early as possible in the development of the proposal in order for the proponent and other stakeholders to be aware of possible EIA obligations. It is also important that screening be applied systematically and consistently, so that the same decision would be reached if others did the screening.

(5) NEPA National Environmental Policy Act

The National Environmental Policy Act (NEPA) is a United States environmental law that promotes the enhancement of the environment and established the President's Council on Environmental Quality (CEQ).

The environmental review under NEPA can involve three different levels of analysis:

a) Categorical Exclusion (CATEX)

A federal action may be "categorically excluded" from a detailed environmental analysis if the federal action does not, "individually or cumulatively have a significant effect on the human environment"

b) Environmental Assessment/Finding of No Significant Impact

A federal agency can determine that a Categorical Exclusion (CATEX) does not apply to a proposed action. The federal agency may then prepare an Environmental Assessment (EA). The EA determines whether or not a federal action has the potential to cause significant environmental effects. Each federal agency has adopted its own NEPA procedures for the preparation of EAs.

c) Environmental Impact Statements (EIS)

Federal agencies prepare an Environmental Impact Statement (EIS) if a proposed major federal action is determined to significantly affect the quality of the human environment. The regulatory requirements for an EIS are more detailed and rigorous than the requirements for an EA.

6) Scoping It is a critical step in the preparation of an EIA, as it identifies the issues that are likely to be of most importance during the EIA and eliminates those that are of little concern. Scoping is a systematic exercise that establishes the boundaries of your EIA and sets the basis of the analyses you will conduct at each stage. A quality scoping study reduces the risk of including inappropriate components or excluding components that should be addressed. It involves:

- Identifying all relevant issues and factors, including cumulative effects, social impacts, and health risks.
- Facilitating meaningful public engagement and review.
- Determining the appropriate time and space boundaries of the EIA.
- Identifying the important issues to be considered in the EIA, such as setting the baseline and identifying alternatives

Scoping is critical as it sets up the boundaries of the EIA, including the project area; it establishes what the EIA will include and how to put the EIA together in accordance with the terms of reference (TOR). An EIA is an intensive process in terms of costs, cross-sectoral

expertise and assessments that must be completed, and the types and extent of the consultations that must be conducted. Scoping helps to select what is needed and what is not relevant, and thus it serves as a work plan for the entire EIA process. The information gathered during the scoping phase is used in the next steps of the EIA.

(7) Environmental auditing A crucial environmental management tool to evaluate the magnitude of an organization's environmental impacts and extract information about the environmental targets and objectives to lessen the effects is known as **environmental audit**. It is used to examine, comprehend and identify issues including environmental legislation and consumer demands. Relying on standard type and focal point of the audit, there are various types of environmental audits.

There are three foremost types of audits:

1. Environmental compliance audits
2. Environmental management audits to authenticate if an organization congregates its specified goals.
3. Functional environmental audits for instance, water and electricity.

Objectives

The chief objectives of an environmental audit are:

- Determine the performance level of environmental management information systems and equipment.
- Authenticate compliance with relevant local, national or other rules and regulations.
- Cutback human contact to hazards from environmental, safety and health complications.

(8) Impact prediction

An impact is any change to a resource or receptor brought about by the presence of a project component or by the execution of a project related activity. The evaluation of baseline data provides crucial information for the process of evaluating and describing how the project could affect the biophysical and socio-economic environment. Impacts are described according to, inter alia, their nature, type and magnitude, as summarised below.

Nature of Impact

- Negative – an impact that is considered to represent an adverse change from the baseline or introduce a new undesirable factor.
- Positive or beneficial – an impact that is considered to represent an improvement to the baseline or introduces a new desirable factor.
- Neutral – an impact that has zero effect on the environment.

Two different forms of impacts are assessed within the EIA:

- Planned impacts – those impacts that result from a planned event. Such impacts are expected to occur during the course of the Project (e.g. an increase in turbidity levels in the water column due to a disruption of seabed sediments); and
- Unplanned impacts – those impacts that result from an unplanned or non-routine event. Such impacts are not expected during the Project but nevertheless the probability of the impact occurring is assessed (e.g. a fuel/oil spill during drilling operations)