



FACULTY OF SCIENCE

DEPARTMENT OF GEOGRAPHY, ENVIRONMENTAL MANAGEMENT & ENERGY STUDIES

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| MODULE | ENM3B: ENVIRONMENTAL MANAGEMENT (SUPPLEMENTARY EXAM) |
| CAMPUS | APK |
| EXAM | DECEMBER 2014 |

DATE DECEMBER 2014

SESSION 08:30–11:30

ASSESSOR(S)

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EXTERNAL MODERATOR

Mr. K.W. MAPHANGWA (UNISA)

DURATION 3 HOURS

MARKS 150

NUMBER OF PAGES: 4 PAGES

INSTRUCTIONS:

1. This examination paper has **FOUR** sections
 2. The use of a calculator is permissible.
 3. The assessment opportunity is **CLOSED BOOK** examination.
 4. Every section must be written in a **SEPARATE ANSWER SHEET**, which should be stapled together if more answering books are used.
 5. Write neatly and eligibly.
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SECTION A**Question 1****CASE STUDY**

**ISO 14001: A Case Study in Certification
at Bayer Pharmaceuticals in Berkeley, California
Lauren E Godshall
Environmental Sciences, University of California at Berkeley**

The ISO 14001 standard is a voluntary international standard outlining the framework for the creation and implementation of an environmental management system (EMS). Being certified as an ISO 14001 company is considered highly prestigious and valuable but few American companies have chosen to build an EMS and gain certification, possibly due to concerns that ISO 14001 tends to only create a "paper EMS" that does not add environmental value to the company. The Bayer Pharmaceuticals site in Berkeley, California is the only Bayer site in North America currently certified. This study employs a case study methodology to conduct an analysis of the company's certification process in order to lead to an understanding of the factors that prevented the Bayer process from resulting in a valueless ISO 14001 certification.

Explain the ISO 14 001 life-cycle (include a diagram) Bayer Pharmaceuticals needs to undertake in order to help restore a pathway towards long term sustainability and environmental balance at their site in Berkeley. In your answer you must also briefly summarise the registration problems associated with ISO 14000 standards that may have accrued to Bayer Pharmaceuticals during the process of adopting this environmental management system.

SUB-TOTAL [30]

**SECTION B
ENVIRONMENTAL RISK ASSESSMENT**

**QUESTION 2
CASE STUDY**

**ENVIRONMENTAL RISK ANALYSIS FOR CRUDE OIL SOIL POLLUTION
Cristiana DUMITRAN& Ion ONUTU (2010)**

Environmental risk assessment (ERA) is predominantly a scientific activity and involves a critical review of available data for the purpose of identifying and possibly quantifying the risks associated with a potential threat. Risk management (RM) is performed to consider the need to impose measures to control or manage the risk. The working methodology presented in this paper was done based on several research studies for the environmental risk assessment for soil pollution with hidrocarbures from accidental crude oil spills. The qualitative and quantitative assessment of the environmental risk for industrial sites for drilling, gas oil separation it is complex and require several data. For these reasons an environmental risk calculation methodology for soil is presented which is structured in modules and steps. Environment risk assessment of pollution with hydrocarbons from crude oil comprises five interrelated modules: hazard identification, hazard assessment, risk estimation by the award of „grades” for the frequency and severity of consequences environmental risk assessment based on risk criteria (ALARP) and environmental risk management. The modules required data: technical data for the equipment in the upstream industrial activities, extraction and gas-oil separation, physico-chemical analysis for the soil contaminants, soil properties that may influence the severity and consequences of the default risk, charts, mathematical equations and matrix assessment of environmental risk intensity. In the methodology are established the steps needed to calculate the alert threshold and intervention and additional studies needed (geotechnical study, pedological and chemical study)

Question 2.1

How is Risk Management determined for different developmental projects (10)

Question 2.2

How does one estimate Environmental Risk and which data will be required to study risk. (10)

Question 2.3

Name the 4 basic steps to characterize risk (10)

SUB-TOTAL [30]

**SECTION C
ASPECTS OF ENVIRONMENTAL MONITORING
(WATER QUALITY)**

QUESTION 3**CASE STUDY**

A base line assessment of water quality is required for some of the individual streams flowing through the Klipriviersberg Nature Reserve, near Johannesburg. In particular, the Kliprivier stream receives runoff from several feeder streams from potential pollution source-areas. The main environmental concern with this tributary is that over the last few years it has been declining in the integrity of riparian habitats as well as other aquatic life forms, mainly due to what is suspected to be chemical and bacteriological (microbiological) pollution upstream.

Whether the sewage infrastructure and other urban land-uses located upstream are having a negative impact on these channels and their biota is not clear at this stage. There is also no scientific literature on the hydrology and the aquatic state of the Kliprivier stream, especially water quality data, thus raising the need for routine environmental monitoring for affected streams within the Klipriviersberg Nature Reserve.

Question 3.1

Explain what pollution means as defined in the National Water Act (1998) also explain in your answer how the National Water Act makes provision for the protection of water sources (10)

Question 3.2

Name 5 conventional pollutants and give a brief description of each one. (10)

Question 3.3

The above scenario involves pollution possibly caused by sewage infrastructure and urban land uses, the best way to test this would be to measure the BOD (Biological Oxygen Demand). Explain what this means and why it would be relevant (10)

SUB-TOTAL [30]

**SECTION D
REVIEW AND EVALUATION OF THE EIA**

QUESTION 4

You have been appointed as the competent authority at the Department of Environmental Affairs (DEA). A consulting company has just submitted an Environmental Impact report for you to assess. What main characteristics would you use to determine whether it is a good Environmental Impact Report (EIR)?

(10)

**SECTION E
QUESTION 5**

Question 5.1

Explain the different purposes of social impact assessment (SIA).

(10)

Question 5.2

A new Mine Manager has joined the firm at Thor Mining Company and a quarterly audit needs to be conducted for their operational phase. The Mine Manager argues that this will be an unnecessary expense and should be taken out of the annual budget. Explain why an audit is important and the different types of environmental audits that can be conducted in South Africa.

(15)

Question 5.3

Give the 5 main steps in Environmental Health assessment and briefly explain each

(10)

Question 5.4

Give guidelines that will assist an amateur heritage specialist determine when a heritage impact assessment will be needed.

(5)

Question 5.5

Explain the purpose of an EMS (Environmental Management System) in any business and why monitoring and auditing the EMS is important.

(10)

SUB-TOTAL [50]

TOTAL [150]