

# Annex III

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## Environmental impact of WSP systems

This Annex reproduces, as a checklist for the environmental impact assessment of WSP systems, Section 4.3 and 4.4 of the UNEP publication *An Approach to Environmental Impact Assessment for Projects Affecting the Coastal and Marine Environment* (UNEP Regional Sea Reports and Studies No. 112).

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### **I. General guidelines for the preparation of an Environmental Impact Assessment Document for a sewage treatment plant for a city with between 100,000 and 1,000,000 inhabitants**

#### **A. DESCRIPTION OF THE PROPOSED PROJECT**

The proposed treatment plant should be described, accompanied by plans, preferably on a scale of 1:2500, including the following:

- a) Types of sewage to be treated (industrial, domestic, agricultural).
- b) Number of inhabitants to be served by the plant.
- c) Types of clients to be served, e.g. industrial, residential, commercial, hospitals.
- d) Quantity of sewage (cubic metres per day or per year).
- e) Quality of sewage to be treated, including suspended solids (mg/litre), settleable solids (mg/litre), pH, turbidity, conductivity, BOD (mg/litre), COD (mg/litre), nitrogen, ammonia, phosphate, oil, surfactants, and heavy metals such as arsenic, cadmium, copper, lead, nickel and mercury.
- f) Method to be used in treatment of sewage.
- g) Layout of the plant (including treatment facilities and service area).
- h) Use of effluents (agriculture, recharging aquifer, disposal to sea or to nearest river).
- i) Description of the plant's recipient body of water, if any.
- j) Sludge quantity and quality.
- k) Method of sludge treatment and disposal.
- l) Chemical, physical and bacteriological characteristics of effluents such as suspended solids, settleable solids, pH, turbidity, conductivity, BOD, COD, nitrogen, ammonia, phosphate, oil, surfactants, and heavy metals such as arsenic, cadmium, copper, lead, nickel and mercury, total coliforms, faecal coliforms and faecal streptococci.
- m) Programme for operation and maintenance of sewage treatment plants.

## **B. REASONS FOR SELECTING THE PROPOSED SITE AND THE TECHNOLOGIES**

The reasons for selecting the proposed site and the technology proposed to be applied, including the short description of alternatives which have been considered, should be provided under this section.

## **C. DESCRIPTION OF THE ENVIRONMENT**

A description of the environment of the site without the proposed sewage treatment plant should concentrate on the immediate surroundings of the proposed project. The size of the area described will be determined by the predicted effects of the proposed plant.

- a) Physical site characteristics
  - (i) Site location on a map at a scale of 1:10,000 or 1:50,000 including residential areas, industrial areas and access roads.
- b) Climatological and meteorological conditions
  - (i) Basic meteorological data such as wind direction and wind velocity.
  - (ii) Special climatic conditions such as storms, inversions, trapping and fumigation, proximity to seashore, average yearly rainfall and number of rainy days per year.
  - (iii) Existing sources of air pollution, especially of particulates and odours.
- c) Geological and hydrological conditions
  - (i) Geological structure of proposed area, including hydrology and aquifers.
  - (ii) Existing uses of water bodies and the proposed site and the quality of the water.
- d) Present land use of the site and its surroundings.
- e) Characteristics of sea area which will be recipient of discharged treated sewage
  - (i) Sea circulation, existence and characteristics of the thermocline, thermohaline structure, dissolved oxygen and nutrients concentration, microbial pollution, fishing grounds, aquaculture sites, marine habitats.
- f) Existence of endemic water borne bodies.

## **D. IDENTIFICATION OF POSSIBLE IMPACTS**

An assessment of anticipated or forecasted positive or negative impacts, using accepted standards whenever possible, of short term impacts associated with the activities related to the construction of the plant and long term impacts related to the functioning of the treatment plant should be given, including the following.

- a) Odours and air pollution from the plant and from the disposal of effluents and sludge.
- b) Infiltration of sewage into topsoil, aquifer or water supply and impact on drinking water quality.

- c) Mosquito breeding and diseases transmitted by mosquitoes.
- d) Pollution of water bodies such as rivers, lakes or sea by effluents and impact on bathing water quality.
- e) Flora and fauna.
- f) Fruit and vegetable safety, if land disposal of effluent or sludge.
- g) Noise levels around plant and its sources.
- h) Solid waste disposal of sludge and other wastes.
- i) Devaluation of property values.
- j) Tourist and recreation areas such as nature reserves, forests, parks, monuments, sports centres, beaches and other open areas which would be impacted.
- k) Possible emergencies and plant failure, the frequency at which they may occur, and possible consequences of such emergencies.
- l) Anticipated or foreseeable impacts on the areas outside of national jurisdiction.

#### **E. PROPOSED MEASURES TO PREVENT, REDUCE OR MITIGATE THE NEGATIVE EFFECTS OF THE PROPOSED PLANT**

This section should describe all measures – whether technical, legal, social, economic or other – to prevent, reduce or mitigate the negative effects of the proposed sewage treatment plant.

#### **F. PROPOSED PROGRAMME FOR MONITORING OF THE ENVIRONMENTAL IMPACT OF THE PROJECT**

Measures to be used to monitor the effects on a long term basis, including the collection of data, the analysis of data, and the enforcement procedures which are available to ensure implementation of the measures.

#### **II. General guidelines for preparation of an Environmental Impact Assessment document for a sewage treatment plant for a city with between 10,000 and 100,000 inhabitants**

These are a slightly simplified version of I above. The principal differences are noted below:

##### **Section A**

Items (e) and (l) are less extensive, as follows:

- e) Quality of sewage to be treated, including suspended solids (mg/litre), settleable solids (mg/litre), pH, turbidity, conductivity, BOD (mg/litre), COD (mg/litre), nitrogen and oil.

- l) Chemical, physical and bacteriological characteristics of effluents such as suspended solids, settleable solids, pH, turbidity, BOD, COD, nitrogen and oil.

### **Section C**

Item (a)(i): map scale to be 1:10,000

### **Section D**

Short-term impacts associated with plant construction do not have to be included, and item (l) is excluded.

