CHAPTER 5

RECOMMENDATIONS IMMEDIATE ACTIONS REQUIRED

CHAPTER 5 RECOMMENDATIONS IMMEDIATE ACTIONS REQUIRED

5.1 WATER RESOURCES DEVELOPMENT

5.1.1 Proposed Action Program

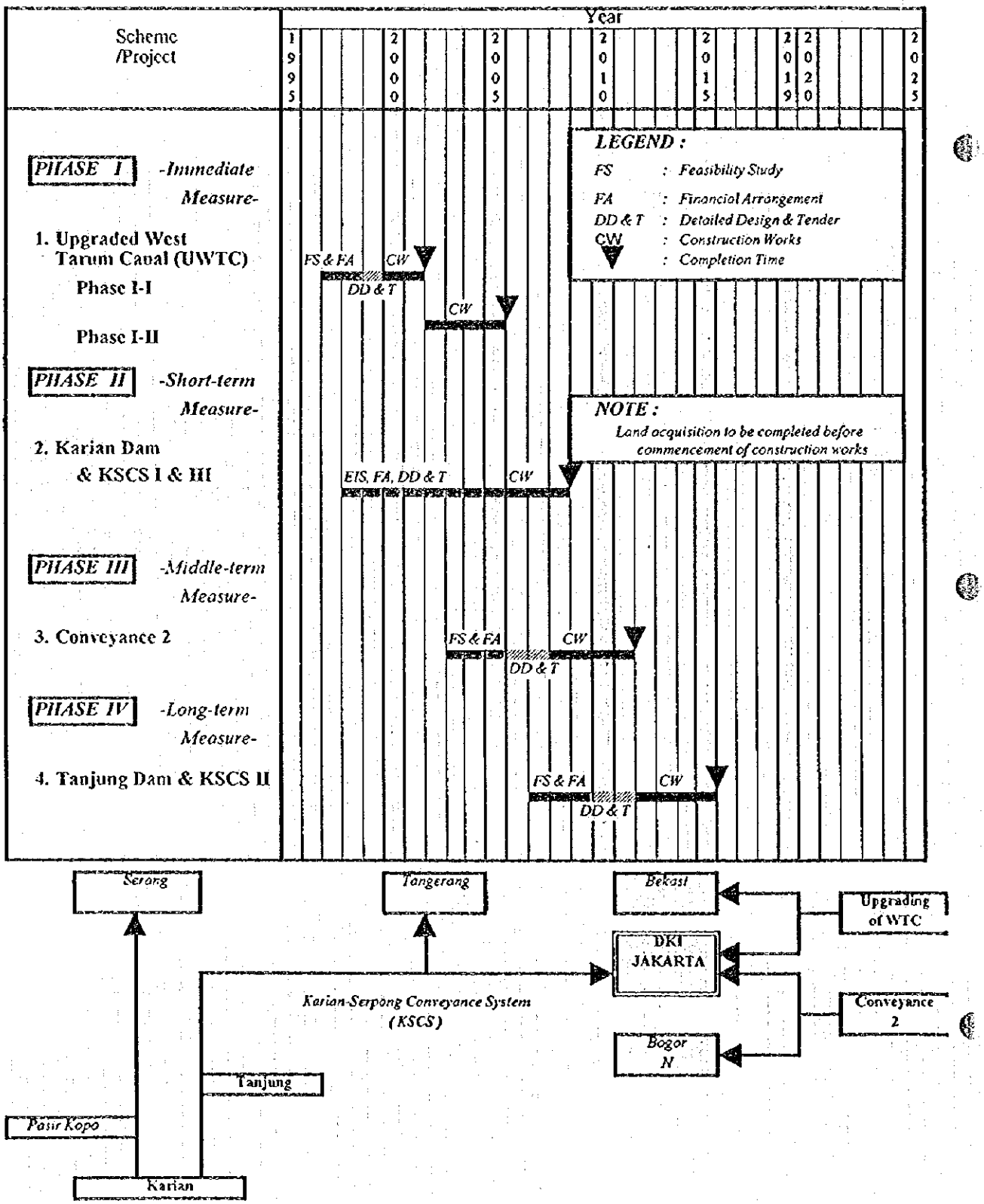
The proposed action program for the Citarum river and Ciujung-Cidurian integrated water resources development projects to meet increasing water demand for the DKI Jakarta is illustrated in **Figure-511.1**, which was prepared based on the phasing implementation plan obtained in the results of the master plan study as mentioned in **Section 3.6.2**. The action program will take the following four (4) development steps for taking the measures :

Phase I	:	*Immediate Measure*
Phase I-I	:	*Upgraded West Tarum Canal*
		- commissioning in 2002 -
Phase I-II	:	*Upgraded West Tarum Canal*
		- 2006 -
Phase II	:	*Short-term Measure*
		Karian Dam & KSCS I & III
		- 2009 -
Phase III	:	*Middle-term Measure*
		Conveyance 2 - Phase I
		- 2012 -
Phase IV	:	*Long-term Measure*
		Conveyance 2
		- 2016 -

5.1.2 Recommendation

(1) As the results of the Study, it is strongly recommended that necessary action for implementation of the development of the Upgrading of the existing West Tarum Canal to increase supply capacity is immediately taken in order to meet the required supply capacity in 2002 for Phase I-I and 2006 for Phase I-II.

Figure-511.1 PROPOSED ACTION PROGRAM ON WATER RESOURCES DEVELOPMENT PROJECTS/SCHEMES FOR DKI WATER SUPPLY SYSTEM



RAW WATER SOURCES AND CONVEYANCE SYSTEMS

(2) Through the Study, it was identified that the Karian Scheme as the short-term measure consisting of the dam, Karian-Serpong Conveyance System (KSCS I & III) with a length of 48.4 km from the Ciuyah tunnel to water treatment plant for the DKI Jakarta and river improvement works along the Ciujung river has urgently in terms of water demand-supply balance and flooding situation in order to support the current economic development in the study area. Therefore, it is strongly recommended to proceed with necessary procedures for executing the said works as already recommended in the Study Report on Ciujung-Cidurian Integrated Water Resources in Indonesia (JICA, 1995).

(3) The Karian Dam Scheme and KSCS I & III were planned by the said Study Report to provide raw water for M&I water supply in the DKI Jakarta, Tangerang and Serang areas. In order to promote implementation of these schemes, it is recommended to establish necessary coordination committee and system with the related agencies to the M&I water supply in DKI Jakarta, Tangerang and Serang as already emphasized in the said Study Report.

(4) In order to successfully execute the resettlement of local residents in the affected areas by proposed schemes, it is suggested that the environmental monitoring and management unit (EMMU) composing the environmental unit (EU) and environmental monitoring and management committee (EMMC) be established under the initiation of Directorate General of Water Resources Development (DGWRD), Ministry of Public Works in close cooperation and coordination with the Directorate General of Human Settlement and Environmental Impact Management Agency.

(5) At present, there are the concerned agencies for coordinating and management for water sources and supply in Indonesia with local coordination committees and panels. It is proposed to establish comprehensive coordination and management committee for promotion of water sources and supply systems development, and coordination, allocation and management of water sources and supply in nationwide in order not induce conflict on water allocation between water users. It is noted for information that the Study Report on Ciujung-Cidurian Integrated Water Resources in Indonesia has proposed the organization and activities of the agencies for implementation of the project and general procedures of low flow management.

(6) Groundwater is a major source of water to satisfy demands in JABOTABEK, particularly for municipal and industrial use in the DKI Jakarta. Excessive groundwater abstraction in the northern part of the DKI Jakarta and its surrounding area has caused the environmental impacts such as land subsidence, while groundwater is still exploitable in the southern part of the DKI Jakarta and its surrounding area, where groundwater abstraction has not yet given remarkably physical and environmental problems, but groundwater abstraction in the southern area, which will be arisen by the steadily and strongly increasing water demand, will encounter same problems as those in the northern part in near future.

Under such situation and conditions, proper management of groundwater is essential for development and conservation. The Study recommends that further development of groundwater in the northern part of the DKI Jakarta is stopped immediately. The present abstraction conditions are maintained and amount of groundwater abstraction should immediately decreases by the permissive yield in 2005, when new water sources and supply systems is expected to be completed. Further development is allowed in the southern part till 2004 and thereafter amount of abstraction should gradually decrease by the permissive yield till 2015.

5.1.3 Immediate Action

The following actions are immediately necessary to proceed with the immediate and short- term measures :

(1) Engineering works of upgrading of West Tarum Canal for financing arrangement

As shown in Figure-511.1, requirement of the upgrading of the West Tarum Canal, Phase I-I, for the DKI Jakarta water supply system will be in 2002 after five (5) years from the beginning of 1997 and that for Phase I-II will be in 2006 after further four (4) years. Under such time schedule, necessary procedure for preparation of detailed design for financing arrangement should immediately commence to avoid delay of the completion of the scheme.

(2) Detailed environmental impact investigation and study

The SRCCIWR has made the preliminary environmental analysis and recommended to take the following immediate action :

1) Establishment of environmental monitoring and management unit (EMMU) consisting of environmental unit (EU) and environmental monitoring and management committee (EMMCC) to successfully execute the resettlement of local residents in the affected area by the proposed scheme.

2) Necessary procedures for commencement of environmental impact assessment.

(3) Establishment of comprehensive coordination and management committee of water sources and supply

As previously stated, it is suggested to take necessary action on establishing a comprehensive coordination and management committee on water sources and supply as soon as possible.

(4) Establishment of law and regulation on groundwater conservation and management

The Study preliminarily proposed the management and control plan on abstraction of groundwater in the DKI Jakarta as mentioned in **Section 3.6.4.** However, as implementation of the management and control plan needs national and local law and regulation, action on its procedures is recommended to be taken as soon as possible.

5.2 WATER SUPPLY FACILITIES

Master plan of water supply facility development is described in the previous **Section 3.7.** To implement the system development conforming to the implementation schedule as shown in **Section 3.12,** following actions are recommended to be executed immediately.

5.2.1 Immediate Actions Required

(1) Completion of Cisadane System

Cisadane System includes Cisadane Water Treatment Plant, treated water transmission pipe to Distribution Center R5, and Distribution Center R4. Construction works of the treatment plant and R5 have been completed except the treated water transmission pipeline. It is recommended to expedite the installation works of the transmission pipeline in order to receive water from the Cisadane Treatment Plant.

(2) Implementation of PJSIP II Project

To reduce NRW and to improve distribution system, Phase II of PJSIP Project (PJSIP II) is recommended to be implement as scheduled from 1996. According to the information from the PAM JAYA, construction works of Distribution Center R4 and treated water transmission pipeline from Tangerang to the R4 are included in the PJSIP II.

It should be noted that, in this study, the results of PJSIP II Project, such as reduction of NRW, addition of service mains, expansion of service area, treated water transmission pipeline to R4, and Distribution Center R4 are considered as existing system of the Jakarta Water Supply System. Unless the PJSIP II Project is implemented as schedule, the basis of the Master Plan becomes different.

(3) Arrangement for Acquisition of Land Space Required

Land space required for facilities included in the 2nd Phase of the Second Stage is recommended to be arranged and acquired. Facilities required newly or additional land space are listed below in the order of priority.

Immediatly Required

- ☐ Buaran III Treatment Plant, for expansion (Addition), 15ha
- ☐ Distribution Center R6 (New), 6ha
- ☐ Cipayung Treatment Plant (New), 45ha
- ☐ Distribution Center R4, for expansion (Addition), 7ha

Required in future (for Third Stage)

- ☐ Cisadane Treatment Plant (Addition), 30ha
- ☐ Distribution Center R3, (New), 3ha

(4) Arrangement for Electric Power Allocation

New facilities or expanded facilities required electric power. PAM JAYA is recommended to discuss with authorities concerned to allocate additional power to water supply facilities.

(5) Engineering Service for Detailed Design

Construction works for the Part 1 of the 2nd Phase of the 2nd Stage should be started from the beginning of 1999. Prior to the construction works, engineering services on detailed design works for expansion of Buaran Treatment Plant (Buaran III), Distribution Center R1 and R6, treated water transmission pipeline, and expansion of distribution system are required This engineering service should be conducted from 1997.

(6) Budgetary Arrangement

Budgetary arrangement for recommended actions listed above is immediately required for both foreign currency portion and local currency portion.

5.3 INSTITUTIONAL FRAMEWORK

Section 3.13 studies the framework of the development of Jakarta Water Supply in cooperation with the private section. This section intends to review some key words in the course of the discussion there.

1. The *strong leadership of the government* to guide and regulate the private-driven operation and development of the Jakarta Water Supply System.

2. Preparation of *fundamental water law* to establish and announce the state principles of water supply service to support the execution of the government leadership.

3. Review of *administrative and organizational structure*, and *role sharing* among the agencies involved to guide the water supply system to work smoothly in line with the basic guidelines set forth in the fundamental water law.

4. *Review of legal systems* for water supply operation and development to regulate the water supply system into sound operation in line with the guidelines set forth in the fundamental water law.

5. *Stronger involvement of BAPPENAS* in the preparation of private participation in national infrastructure development and to check and supervise those programs in terms of contents and progress, and guide them to be consistent with or not to hinder smooth implementation of the national development plan.

5.4 ORGANIZATION, MANAGEMENT, AND FINANCE OF WATER ENTERPRISE

5.4.1 Organization and Management

In Section 4.11, new organization structure is designed in order for PAM JAYA to perform regulatory roles. However, the following additional steps should be taken to be able to achieve efficient and effective organizational performance:

1) Work analysis such as allocation of duties and responsibilities among sections and bureaus and between individuals are performed by management consultants.

2) Based on the analysis above, detailed job description of each staff should be prepared and required staff should be assigned in accordance with his/her skills and expertise.

As mentioned in the preceding section, regulatory roles of PAM JAYA will necessitate further strengthening its managerial capabilities as well as staff skills. Strengthening skills and abilities of all levels of personnel in the organization should be done through effective training.

5.4.2 Finance

As most likely agreed between PAM JAYA and the private consortia, the fees to be charged by the consortia will be linked to an index of the cost elements of the consortia and will be adjusted semi-annually. However, considering the present tariff approval process of PAM JAYA, which generally takes more than one year, PAM JAYA water tariff would be unable to be revised as frequently as fees of the consortia. If the tariff remains unchanged for three years (as the current practice), it is probable that the semiannually increasing fee would result in PAM JAYA's insufficient cash flow to meet its requirement such as debt service, operating expenses and contribution to PEMDA DKI. This may cause PAM JAYA to borrow additional loans and/or to ask the government for subsidies. In order to avert the unfavorable circumstance, if the indexed fee significantly increases to such an extent that PAM JAYA cannot cover its requirements, fee should be reviewed by taking into account financial projection of both PAM JAYA and the consortia. On the other hand, PAM JAYA should use more open and transparent procedures and calculation methods in determining tariff as recommended in the JICA Master Plan.

CHAPTER 6

ENVIRONMENTAL IMPACT ASSESSMENT

CHAPTER 6 ENVIRONMENTAL IMPACT ASSESSMENT

6.1 INITIAL ENVIRONMENTAL EXAMINATION (IEE)

6.1.1 Background

According to the results of Master Plan and Feasibility Study, it has proposed : (a) an expansion of water treatment plant (WTP) Buaran of about 5,000 l/s, (b) to built a WTP in Cipayung which has a capacity about 5,000 l/s, (c) to expand and to build distribution centers both in south and north Jakarta.

Those plans are expected to bring either positive or negative environmental impacts, hence since the environmental impact assessment (EIA) should be executed to describe the environmental consequences of proposed implementation. Based on Government Regulation 51/1993, an EIA is mandatory to be carried out.

The report of Initial Environmental Examination (IEE) is included in **Annex-61.**

6.1.2 Purpose of the Study

The purpose of the Study is as follows;

1. To identify components form all activities in both WTPs, distribution centers and distribution networks that have significant impacts into the environment.
2. To describe the environmental setting in which the proposed implementation is to take place.
3. To predict and assess the impacts associated with proposed implementation and prediction of anticipated change.
4. To predict and evaluate major impacts from the transmission and distribution pipes installation and determination of the magnitude of the particular change from the proposed action.

This study is written in accordance with the government regulation 51/1993 that is a EIA terms of

reference for the study of expansion of WTP Buaran, WTP Cipayung, distribution centers and networks of Jakarta. This terms of reference is expected to be a guidance for the responsible body (the owner of the project) how to conduct the EIA study and what should be done in order this study accepted as a legal document by the government.

6.1.3 Environmental component to be Studied

(1) Physical and Chemical Components

Physical and chemical components will cover climate, air quality and noise (mainly in Cipayung WTP), water quality from West Tarum Canal, land use and spatial planning, physiograph, hydrology and public utilities nearby area.

(2) Biologycal Component

Major impacts from many actions sometimes occur on floral and faunal spaces that are components of the biological environment within and adjacent to project areas. Fortunately, based on data available on the project area indicated that the biological impact is considered minor and not necessarily studied in detail. However, as needed by a standard operating procedure in an environmental impact assessment study a brief discussion on biologycal impact will be shown.

(3) Social-Economy and Cultural Components

Many major impacts associated with certain proposed actions are evidenced by changes in socioeconomic factors in the project area and surrounding region. Socio economic changes may be beneficial or detrimental. The socio economic environment will be studies are as follows :

6.1.4 Methodology

This study consider three analytical functions associated with environmental impact assessment : identification, prediction, and evaluation. Methods for identification of environmental impacts can assist in specifying the range of impact that may occur, including their spatial dimensions and time period. Generally, identification methods answer questions concerning the components of the project and what elements of the environment may be concerning the components of the project and what elements of the environment may be affected by these components.

Identification include : identification of environmental modification that may be significant, forecasting of the quantity and / or spatial dimensions of change in environment identified, and estimation of the probability that the impact will occur.

Evaluation include determination of the incidence of costs and benefits to user groups and population affected by the project, and specification and comparison of the trade off between various alternatives.

(1) Method of Impact Identification

Impact identification will be conducted by the use of matrixed that show the interaction among components in accordance with EIA Matrix from the Department of Public Works.

(2) Method of Impact Prediction

Impact prediction will be conducted in order to know the quantitative impact by the use of mathematical formula from some references and based on researches or other expert opinions / suggestions. However, method of impact prediction in this study will be focused on Cost Benefit Analysis Method.

(3) Impact Evaluation Method

The evaluation of major impact which carried out holistically and based on causative is expected to understand major impacts and followed by deciding the handling priority based on Government Regulation No.51/1993 on EIA and the Head of Bapedal Decree No.056/1994 on Major Impact Guidelines.

The major impact form an activity is depended on :

1. The quantity of human being impacted
2. The area influenced
3. The longer of impact
4. The impact intensity
5. The amount of other environmental component exposed
6. The cumulative of impact
7. The reversibility or non reversibility of impacts

From those guidelines then the government will be able to control and monitor the impact and how to mitigate the impact itself. The alternative to be elected is depend on the feasibility on the application in the field.

6.1.5 Environmental Management and Monitoring Plan

(1) Environmental Management Plan

Environmental management plan consist of five basic point specified by the government regulation PP51/1993 :

1. Goal and benefit of environmental management.
2. Sources and various major impact need to be managed.
3. Reasons for the use of management system from the technological, economical and institutional aspect.
4. Method and equipment to be used and time schedule for the environmental management plan.
5. Application of environmental management include of whose responsible for the management, inspection, control mechanism and financial.

(2) Environmental Monitoring Plan

Environmental monitoring plan include five basic point as guided by the government regulation 51/93 as follows :

1. Goal and benefit of environmental monitoring plan.
2. Sources and various major impact need to be managed.
3. Reasons for the use of monitoring system from the technological, economical and institutional aspect.
4. Method and equipment to be used and time schedule for the environmental monitoring plan.
5. Application of environmental monitoring include of whose responsible for the management, inspection, control mechanism and financial..

6.2 ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

6.2.1 Introduction

According to the Indonesian regulation, Law No. 4 - 1982 regarding Basic Definition for Environmental Management, and the Government Regulation No. 51 - 1993 regarding Environmental Impact Assessment (EIA), EIA should be executed before implementation of the certain project which will cause some environmental impacts as a result of the project implementation. In the water supply sector, it is defined that a project which will use raw water from the lake, river, spring or others in amount of more than 2 m3/sec, should not be implemented without execution of the EIA.

For the Jakarta Water Supply Development Project, it is apparent that EIA is required to be conducted before the project implementation, because an amount of raw water required for the project will exceed the amount which is defined in the regulation mentioned above.

This EIA was conducted by the Indonesian Consultants as a sub-contracting works of the JICA Study Team.

Following sections are a summary of the Draft Final Report of Environmental Impact Assessment which was prepared by the Indonesian Consultants and submitted in March 1997. The Draft Final Report is attached as Annex-62 of this report.

The Draft Final Report of EIA will be finalized through discussions between the Indonesian Agencies concerned and the Indonesian Consultants under the responsibility of the Indonesian side as mutually agreed between Indonesian side and JICA during the Inception Meeting held in July 1995.

The finalized Report will have approval procedure for the implementation of the Project.

6.2.2 Purpose of the EIA

Purposes of EIA are as follows:

- To identify project component which will be the object of the assessment
- To identify present environmental condition before the project implementation
- To predict environmental impacts which will be caused by the project implementation
- To evaluate magnitude and importance of the predicted environmental impacts
- To formulate Environmental Management and Monitoring Plan

EIA was conducted based on the Terms of Reference (TOR) which had been prepared under the Initial Environmental Examination (IEE). The TOR for the EIA had been approved by the Indonesian agencies concerned prior to the execution of the EIA.

6.2.3 Environmental Components

Environmental Components which were assessed under the EIA are as follows

Physical Component

- Climate
- Air quality and noise
- Water quality
- Physiography
- Hydrology
- Land use

- Road and traffic facilities

Biological components

Socio-economic and Socio-cultural Components

- Population
- Socio-economy
- Socio-culture
- Community health condition

Public Utilities

6.2.4 Results and Evaluation of Environmental Impact Assessment

Scope of the project which are the object of the environmental impact assessment are

- Buaran III Water Treatment Plant (WTP),
- Cipayung WTP,
- Distribution Centers (R1, R4, R5 and R6), and
- Transmission Mains and Distribution Mains

As a result of the assessment, following four points were evaluated as important impacts among other various impacts. Evaluation of each impact are also described as follows.

(1) Resettlement of people those who are living in the planned treatment plant location

There is a local village adjacent to the existing Buaran I & II water treatment plant where is planned to be constructed new Buaran III treatment plant. The village is not so densely developed but some of houses are required to be removed for the plant construction. It is recommended that the PAM JAYA should explain the construction plan of the new plants to the people in the village and start discussion with them on resettlement compensation as soon as possible to avoid delay of commencement of the construction works.

(2) Air pollution and noise problem during construction stage and operation stage after construction works

Air pollution and noise problem may occur during the construction period which will from heavy construction vehicle including pile driving works. These significant impacts will occur only during the construction period and will be able to reduce these impacts with suitable construction planning. During the operation period after construction, these impacts will also occur but these impacts can be minimized by adequate maintenance works on equipment in the plants.

(3) Traffic disturbance during construction stage

This impact will be able to minimize by close coordination with traffic police department and by suitable construction planning. Heavy traffic jam will be able to reduce its seriousness by securing adequate detour and installation of necessary sign boards.

(4) Sludge discharge from the treatment plants

The amount of sludge can be minimize by introducing adequate sludge treatment facilities.

In the feasibility study, several sludge treatment methods were introduced for Buaran WTP and sludge drying bed method was proposed for the Cipayung WTP.

Based on the results of environmental impact assessment as summarized above, no fatal flaw has been found that renders the proposed project non-viable from an environmental impact point of view.

In summary, the construction of treatment plants, pipelines and related infrastructure will not cause substantial disturbance. The environmental consequences associated with these impacts are not considered to be significant if managed during and after construction as stipulated in the environmental management plan.