

Major Understandings to be taken by Each Government

No	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	to secure of land necessary for the implementation of the Project and to clear the site		•
2	To construct the following facilities		
	1) East Pump House, Pump Facility and Sea Tide Dike	•	
	2) The gates and fences in and around the site		•
	3) The road outside the site		•
3	To provide facilities for distribution of electricity, water supply and drainage and other incidental facilities necessary for the implementation of the Project outside the site		
	1) Electricity		
	a. The distributing power line to the site		•
	b. The drop wiring and internal wiring within the site	•	
	c. The main circuit breaker and transformer	•	
	2) Water Supply		
	a. The city water distribution main to the site		•
	b. The supply system within the site (receiving and elevated tanks)	•	
	3) Drainage		
	a. The city drainage main (for storm sewer and others to the site)		•
	b. The drainage system (for toilet sewer, common waste, storm drainage and others) within the site	•	
	4) Gas Supply		
	a. The city gas main to the site		N/A
	b. The gas supply system within the site	N/A	
	5) Telephone System		
	a. The telephone trunk line to the main distribution frame/panel (MDF) of the building		•
	b. The MDF and the extension after the frame/panel	•	
	6) Furniture and Equipment		
	a. General furniture		•
	b. Project equipment	•	
4	To ensure prompt unloading and customs clearance of the products at ports of disembarkation in the recipient country and to assist internal transportation of the products		
	1) Marine (Air) transportation of the Products from Japan to the recipient country	•	
	2) Tax exemption and custom clearance of the Products at the port of disembarkation		•
	3) Internal transportation from the port of disembarkation to the project site		•
5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the products and the services be exempted		•
6	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		•
7	To ensure that the Facilities and the products be maintained and used properly and effectively for the implementation of the Project		•
8	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project		•
9	To bear the following commissions paid to the Japanese bank for banking services based upon the B/A(*)		
	1) Advising commission of A/P		•
	2) Payment commission		•
10	To give due environmental and social consideration in the implementation of the Project.		•

(B/A : Banking Arrangement, A/P : Authorization to pay)

(*)Payment of Advising and Payment commission are agreed on Exchange of Notes between the GOI and the GOJ

**Concerns on the Design of Temporary East Pump Station
in terms of Safe Construction, Operation and Maintenance**

The following concerns are presented by the team only for consideration of Indonesian side in order to make sure that the Temporary East Pump Station can play expected role without damage until implementation of the Project. Indonesian side can review their design in consideration of these concerns under their own responsibility.

I. Discharge Piping System

1. Stop Logs

Stop logs have been provided to prevent the intrusion of sea water into the dry area in case of emergency. Stop logs shall be considered as Secondary Sea Dike/Wall. For the design of stop log system, the following matters to be considered:

(1) Guides for Stop Logs

Guides for Stop Logs shall be carefully provided so as not to reduce the strength of existing concrete structure. Guides shall be provided for walls and bottom slab.

(2) Stop Logs

Stop Logs shall be of steel with sufficient strength and watertightness against sea water pressure.

2. Sea Dike

In consideration of the nature of rehabilitation works as temporary measure for duration less than two years, water discharge pipes have been installed through Sea Dike made of masonry concrete. However, Sea Dike shall be strong and stable enough against sea water pressure with watertightness. These shall be verified by calculation. Stability of Sea Dike shall be secured by gravity; however, it seems that the shape and weight of present Sea Dike is not sufficient.

3. Measures against Differential Settlement of structure

There is no flexible joint installed in the present discharge pipe system. To prevent from the excessive damage to the pipes and structure due to differential settlement of ground, the following periodical monitoring can be carried out:

(1) Measurement of deformation of pipes

Level gauges can be installed on discharge pipes upon completion of the works. Monitoring of the changes in level gauges will provide indication on deformation or strain of pipes.

(2) Examination of pipe joints

Joints between pipes either welded or flanged can be examined in view of unusual deformation.

(3) Examination of water leakage through Sea Dike

Visual inspection of Sea Dikes on cracks and water leakage can be recommended.

4. Prevention of Backward Flow in Discharge Pipes

Backward flow in discharge pipes at the time of stoppage of pumps can be prevented by flap valve installed at the mouth of outlet discharge pipe; however watertight closure of flap valve may sometimes be blocked by foreign objects. Therefore, it is recommended that the discharge valve will also be closed at the same time.

II. Electrical System

(1) Urgent repair of the existing electrical room for East and Central Pump Stations, which had been damaged by piping at East Pump Station

(2) Necessary maintenance of the emergency generators in the generator room and the substation equipment in the electrical room including repair of meters and indication lamps of panels, repair of room lightings, etc.

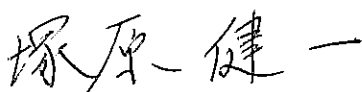
Minutes of Discussions
on
The Preparatory Survey
on
The Project for Urgent Reconstruction of East Pump Station of Pluit
In Jakarta, the Republic of Indonesia
(Explanation on Draft Report)

In response to a request from the Government of the Indonesia (hereinafter referred to as "GOI"), the Government of Japan (hereinafter referred to as "GOJ") decided to conduct a Preparatory Survey on the Project for Urgent Reconstruction of East Pump Station of Pluit in Jakarta, the Republic of Indonesia (hereinafter referred to as "the Project") in the Republic of the Indonesia (hereinafter referred to as "the Indonesia") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to the Indonesia the Preparatory Survey Team (hereinafter referred to as "the Team"), which is headed by Mr. Kenichi Tsukahara, Senior Adviser, JICA and is scheduled to stay in the country from 25th May to 1st June 2010.

The Team held discussions with the concerned GOI officials and conducted a field survey at the study area. In the course of discussions and field survey, both parties confirmed the main items described in the attached sheets.

Jakarta, 31st May, 2010



Mr. Kenichi Tsukahara
Leader,
Preparatory Survey Team,
Japan International Cooperation Agency



Mr. Widagdo
Director of River, Lake and Reservoir,
Directorate General of Water Resources,
Ministry of Public Works (PU)
Republic of Indonesia



Mr. Budi Widiyanto
Director of Public Works Department,
City of Jakarta
(DKI Jakarta)
Republic of Indonesia

ATTACHMENT

I. Components of the Draft Report

The Indonesian side agreed and accepted in principle the components of the Draft Report explained by the Team. The Indonesian side also agreed that the components of the Project will be determined by the Indonesian side and the GOJ based on the result of the survey.

II. Japan's Grant Aid scheme

The Indonesian side understands Japan's Grant Aid Scheme and the necessary measures to be taken by the GOI as shown in Annex-3.

III. Schedule of the Survey

The tentative implementation schedule is shown in Annex-1.

JICA will complete the final report in accordance with the confirmed items and send it to the GOI by August 2010.

V. Confidentiality of the Project

(1) Detailed Specifications

Both sides confirmed all the information related to the Project including detailed specifications of the facilities, equipment and other technical information shall not be released to any other party(ies) before the signing of all the Contract(s) for the Project.

(2) Project Cost Estimate

The Team explained to the Indonesian side the estimated project cost to be borne by the GOJ as attached in Annex -2. Both sides agreed that the Project Cost Estimate should never be duplicated in any form nor disclosed to any other party(ies) before the signing of all the Contract(s) for the Project. This confidentiality of the estimated project cost is necessary to ensure fairness of the tender procedure.

VI. Undertakings of GOI

(1) Access Road for Construction

Indonesian side (DINAS PU DKI Jakarta) agreed to secure the access road to the Project site during implementation of the Project before January 2011.

(2) Provision of Disposal Area of Demolished Construction Debris

Both sides confirmed that the demolishing work of the existing East Pump Station and transportation of construction debris to the designated disposal area will be undertaken by Japanese side.

Indonesian side (DINAS PU DKI Jakarta) agreed to provide the disposal area of demolished construction debris of the existing East Pump Station at own cost before January 2011 and take necessary measures regarding the final disposal and/or appropriate treatment, if necessary, according to the related law.

(3) Relocation of Anchored ships

Indonesian (DINAS PU DKI Jakarta) side agreed to relocate anchored ships by Indonesian side before January 2011.

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(4) Relocation of Marine Police Station and related facilities

Indonesian (DINAS PU DKI Jakarta) side agreed to relocate Marine Police Station and related facilities at the west end of the existing Sea Tide Dike by Indonesian side before January 2011.

(5) Relocation of Power Receiving Facility

Indonesian (DINAS PU DKI Jakarta and PLN) side agreed to relocate PLN power receiving panel in the existing East Pump Station and related power cables to Central Pump Station by Indonesian side before January 2011.

(6) Alternate Drainage Facility during Reconstruction of East Pump Station

Indonesian (DINAS PU DKI Jakarta) side agreed to complete the installation of Duri pumps with drainage capacity of $6\text{m}^3/\text{s}$ before January 2011. Indonesian side (DINAS PU DKI Jakarta) also agreed that in case that Indonesian side can not complete the installation of Duri pumps before the above time limit, Indonesian side shall provide temporary pump units with total capacity of $6\text{m}^3/\text{s}$ instead as the alternate undertakings of the Indonesian side.

(7) Clearance of EIA Requirement

Indonesian (DINAS PU DKI Jakarta) side agreed to submit UKL and UPL to Jakarta Environmental Management Agency (hereinafter referred to as "BPLHD") for approval and to complete the submission of a copy of approval letter from BPLHD to the Team by the end of June 2010.

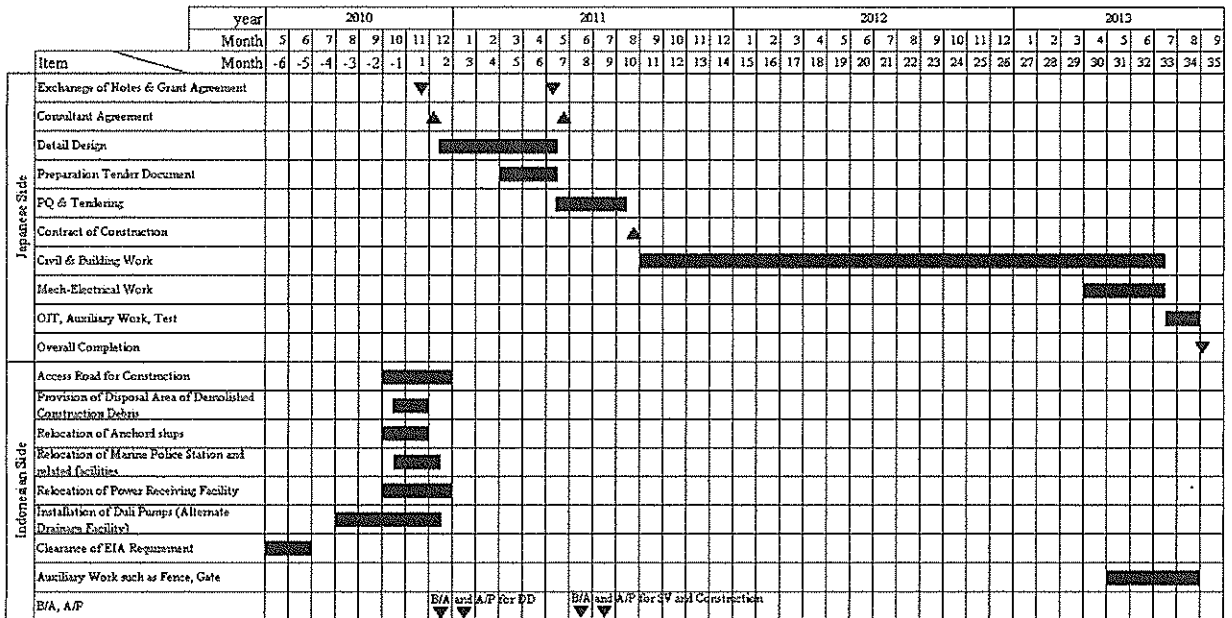
Annex -1 Tentative Implementation Schedule

Annex -2 Project Cost Estimation

Annex -3 Japan's Grant Aid Scheme

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Tentative Implementation Schedule



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Project Cost Estimation

(1) Cost to Be Borne by the Japanese Side


Estimated Project Cost: 2,012 million JPY

		Project Cost (million JPY)	
Facility Construction	Pump Station (Including Demolition of existing facilities)	794	1,847
	Mechanical and Electrical Facilities	628	
	Sea Tide Dike	425	
Detail Design, Construction / Procurement Supervision			165

(2) Cost to Be Borne by the Recipient Side

Estimated Project Cost: 170 million JPY

Organization	Item	Project Cost (million JPY)	
DINAS PU DKI Jakarta	Access Road for Construction	42	169
	Provision of Disposal Area of Demolished Construction Debris	N/A	
	Relocation of Anchord ships	N/A	
	Relocation of Marine Police Station and related facilities	3	
	Relocation of Power Receiving Facility	10	
	Installation of Duri Pumps(Alternate Drainage Facility)	107	
	Clearance of EIA Requirement	3	
	Explanation to Surrounding Residents on Construction	N/A	
	Auxiliary Work such as Fence, Gate	4	
DGWR PU	Commission to a Bank for Banking Arrangement and Authorization to Pay	1	1


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JAPAN'S GRANT AID

The Government of Japan (hereinafter referred to as “the GOJ”) is implementing the organizational reforms to improve the quality of ODA operations, and as a part of this realignment, a new JICA law was entered into effect on October 1, 2008. Based on this law and the decision of the GOJ, JICA has become the executing agency of the Grant Aid for General Projects, for Fisheries and for Cultural Cooperation, etc.

The Grant Aid is non-reimbursable fund provided to a recipient country to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials as such.

1. Grant Aid Procedures

The Japanese Grant Aid is supplied through following procedures :

- Preparatory Survey
 - The Survey conducted by JICA
- Appraisal & Approval
 - Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet
- Authority for Determining Implementation
 - The Notes exchanged between the GOJ and a recipient country
- Grant Agreement (hereinafter referred to as “the G/A”)
 - Agreement concluded between JICA and a recipient country
- Implementation
 - Implementation of the Project on the basis of the G/A

2. Preparatory Survey

(1) Contents of the Survey

The aim of the Preparatory Survey is to provide a basic document necessary for the appraisal of the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the recipient country necessary for the implementation of the Project.
- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of an outline design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant Aid project. The Outline Design of the Project is confirmed based on the guidelines of the Japan's Grant Aid scheme.

JICA requests the Government of the recipient country to take whatever measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization of the recipient country which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA reviews the Report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the appropriateness of the Project.

3. Japan's Grant Aid Scheme

(1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes (hereinafter referred to as "the E/N") will be signed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the recipient country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals".

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(4) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by JICA. This "Verification" is deemed necessary to fulfill accountability to Japanese taxpayers.

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as Annex.

(6) "Proper Use"

The Government of the recipient country is required to maintain and use properly and effectively the facilities constructed and the equipment purchased under the Grant Aid, to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Grant Aid.

(7) "Export and Re-export"

The products purchased under the Grant Aid should not be exported or re-exported from the recipient country.

(8) Banking Arrangements (B/A)

- a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). JICA will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.
- b) The payments will be made when payment requests are presented by the Bank to JICA under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions paid to the Bank.

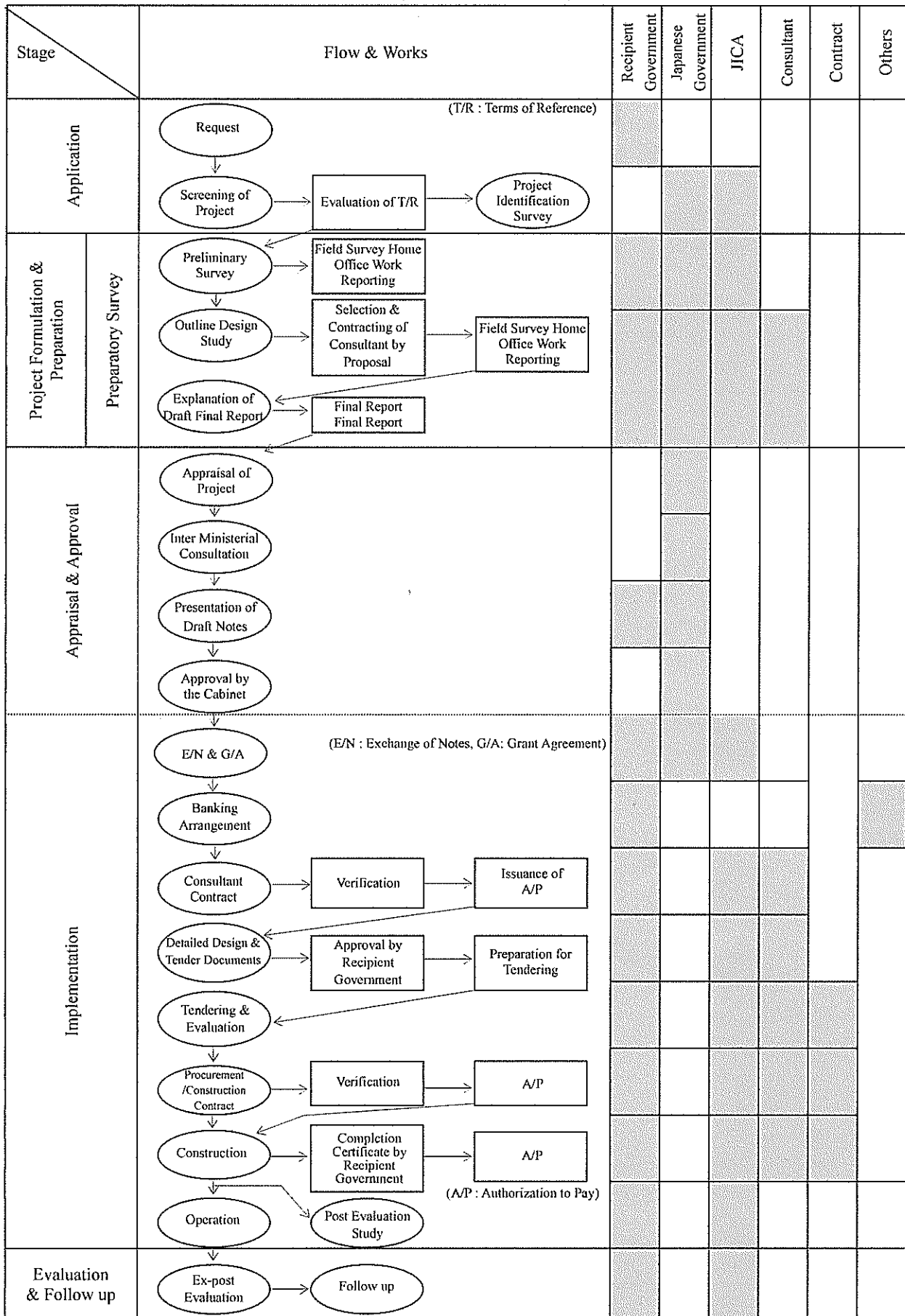
(10) Social and Environmental Considerations

A recipient country must carefully consider social and environmental impacts by the Project and must comply with the environmental regulations of the recipient country and JICA socio-environmental guidelines.

(End)

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FLOW CHART OF JAPAN'S GRANT AID PROCEDURES



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Major Understandings to be taken by Each Government

No	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	to secure of land necessary for the implementation of the Project and to clear the site		•
2	To construct the following facilities		
	1) The building	•	
	2) The gates and fences in and around the site		•
	3) The parking lot	•	
	4) The road within the site	•	
	5) The road outside the site		•
3	To provide facilities for distribution of electricity, water supply and drainage and other incidental facilities necessary for the implementation of the Project outside the site		
	1) Electricity		
	a. The distributing power line to the site		•
	b. The drop wiring and internal wiring within the site	•	
	c. The main circuit breaker and transformer	•	
	2) Water Supply		
	a. The city water distribution main to the site		•
	b. The supply system within the site (receiving and elevated tanks)	•	
	3) Drainage		
	a. The city drainage main (for storm sewer and others to the site)		•
	b. The drainage system (for toilet sewer, common waste, storm drainage and others) within the site	•	
	4) Gas Supply		
	a. The city gas main to the site		N/A
	b. The gas supply system within the site	N/A	
	5) Telephone System		
	a. The telephone trunk line to the main distribution frame/panel (MDF) of the building		•
	b. The MDF and the extension after the frame/panel	•	
	6) Furniture and Equipment		
	a. General furniture		•
	b. Project equipment	•	
4	To ensure prompt unloading and customs clearance of the products at ports of disembarkation in the recipient country and to assist internal transportation of the products		
	1) Marine (Air) transportation of the Products from Japan to the recipient country	•	
	2) Tax exemption and custom clearance of the Products at the port of disembarkation		•
	3) Internal transportation from the port of disembarkation to the project site	•	
5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the products and the services be exempted		•
6	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		•
7	To ensure that the Facilities and the products be maintained and used properly and effectively for the implementation of the Project		•
8	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project		•
9	To bear the following commissions paid to the Japanese bank for banking services based upon the B/A		
	1) Advising commission of A/P		•
	2) Payment commission		•
10	To give due environmental and social consideration in the implementation of the Project.		•

(B/A : Banking Arrangement, A/P : Authorization to pay)

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資料－5 事業事前計画表

事業事前計画表（概略設計時）

1. 案件名
インドネシア共和国プルート排水機場緊急改修計画
2. 要請の背景（協力の必要性・位置付け）
(1) 当該国における防災セクターの開発実績（現状）と課題
<p>インドネシア国（以下「イ」国）のジャカルタ特別州は、低平な扇状地に位置し、そこを南部山岳地帯に源を発する 10 本の河川が貫流するという地形的条件から、長年にわたり洪水被害が繰り返されてきた。また、ジャカルタ首都圏などでは、過度の人口集中と無秩序な住宅密集地の形成、地下水の過剰の汲み上げによる地盤沈下などにより、特に都市内の洪水被害に対する脆弱性が增大している。さらに、地球温暖化の進展に伴い、年間降雨パターンが変化し、乾期における降雨量の低下と期間の長期化、雨期における降雨量の増加と期間の短期化等、気候変動に伴う洪水等の発生頻度が増加・深刻化している。こうした洪水災害は、インフラや家屋等の物質的損失に留まらず、経済活動の停滞や貧困の増加等の経済的・社会的損失を伴うことから、同国の持続可能な開発のリスク要因の一つとなっている。こうした状況下で、1973 年にはインドネシア政府により排水・洪水制御基本計画が策定され、主として排水事業が実施されてきたものの、近年では 1976 年、1996 年、1998 年、2002 年、2007 年に大規模な洪水が発生していることに加え、毎年中小規模の洪水を受けている状況にある。特に 2002 年においては、ジャカルタ特別州の約 13%に相当する 87.1km²を冠水させ、死者 80 人を出し、近年では、2009 年 3 月に、ジャカルタ南西部の保全池のダムが崩壊して、99 名の死者および 1000 棟近い家屋の倒壊を引き起こしているなど、近年の洪水被害による経済的損失は 10 兆 Rupia（約 1000 億円）にも達する莫大なものといわれている。</p> <p>当機構は、1997 年にジャカルタ首都圏地域を対象にした開発調査「ジャボタベック総合水管理計画調査」、2002 年には在外基礎調査「ジャボタベック地域緊急洪水被害調査」を実施し、河川や洪水防御施設の改修、遊水池の整備などの構造物対策を提言し、また、技術協力プロジェクト「ジャカルタ首都圏水害軽減組織強化プロジェクト」を 2007 年 3 月に開始し、水害対策に関連する機関の河川構造物の維持管理、洪水警報、洪水氾濫区域図の設定、流域流出抑制等の非構造物対策による能力強化を行ってきている。しかしながら、ジャカルタの洪水は、気候変動による洪水頻度の増加、既存の排水施設の老朽化、無秩序な宅地開発、人口増加、地盤沈下による雨水浸透区域の現象等に伴い、増加が大きく懸念される状況にあることに加えて、上記の状況により既存の排水マスタープランに沿った排水計画が十分に実施に移せていない状況にある。</p> <p>ジャカルタ中心市街の排水区域約 42.1km²の雨水排水は、3 箇所に分散されて設置されている排水機場（プルート、チデン、メラティ）によって実施されているが、今回対象となるプルート排水機場は約 34km²の区域の排水を受け持つ最も重要な施設であるにもかかわらず、東、中央、西の 3 箇所の排水機場のうち、東排水機場は、建設から 45 年以上経過していることもあり、かなりの老朽化が進み、2008 年の雨季に入ってから、東排水機場に隣接している排水路の側溝壁（防潮壁）が大規模なパイピング¹破壊により海水が東排水機場の底を抜けて排水機場手前に設置された調整（プルート調整池）へ流入する事態となり、調整池が海水で満杯となることによる東排水機場全体の機能停止</p>

が危惧された。パイピングは海から発生したものではなく、東排水機場排水路のコンクリート床板および側壁のひび割れに起因するものであることが判明したため、現在は応急対策として、排水路と海を応急的に遮断し、既存の運転可能なポンプ2台のみでの応急稼働により、排水を行っている状況である。

排水機場全体が機能不全に陥った場合は、対象地域の排水調整機能が止まることになるとともに雨水および海水の流入による、大規模な浸水被害の発生が予想される。その場合の被害予想面積は、人口が極度に密集した北ジャカルタ周辺10km²以上にわたると考えられる。

プルート排水機場の管理者であるジャカルタ特別州は、緊急復旧を行い運転を再開することを目指していたが、緊急調査によると、排水機場建屋の下部の吐出槽の底部にパイピングホールが想定されること、防潮壁のひび割れが大きいこと、また、排水機場自体が耐用年数を上回っていることから全体の建替えが必要と判断された。しかし、排水機場の建設には多額の費用が必要となること、また建設現場が海に面した軟弱地盤地帯で、地盤沈下も激しいことから、技術的にも難しい工事であるため、日本政府への支援を要請したものである。

¹ 浸透力によって土粒子が流出し、地盤内にパイプ状の水みちができる現象。一部でパイピングが発生すると、それに接する土中の動水勾配が増えて浸透力が増大し、さらにパイピングが進行する。埋立地あるいは掘削地盤の破壊の原因となる。

(2) 当該国における防災セクターの開発政策と本事業の位置づけ

インドネシア政府は、中期国家開発計画（RPJM:2004-2009）において、統合的水資源管理を通じた洪水被害の軽減を重要な戦略プログラムの一つとして掲げている。

本事業は、人口が極度に密集し、洪水被害の影響を最も受けやすい北ジャカルタ地域の、雨水・排水制御のためのインフラの緊急改修を行うものであり、対象地域の排水機能の回復と洪水被害の軽減が期待される。以上の観点から、本機構が支援する必要性・妥当性は高い。

(3) 防災セクターに対する我が国及び JICA の援助方針と実績

我が国の対インドネシア国別援助計画（2004年11月）では、重点分野・重点事項として「民主的で公正な社会造り」のための支援を掲げ、「基礎的公共サービスの向上」として、地方の自立発展のため、頻発する洪水等の自然災害対策の支援、「環境保全・防災」として都市住民の居住環境整備（自然災害対策も含む）への支援を行うとしている。これを受けて、本機構は災害対策を協力プログラムの一つとして位置付けており、本事業はその方針に則っている。

これまでの防災セクターでの主な事業実績については、以下の通り。

【有償】

- ・ 災害復興・管理セクター・プログラムローン
- ・ チタルム川上流洪水防御事業（Ⅱ）
- ・ メダン洪水防御事業
- ・ 気象変動対策プログラムローン

【技プロ】

- ・ ジャカルタ首都圏流域水害軽減組織強化プロジェクト

- ・河川流域機関実践的水資源管理能力向上プロジェクト

【開調】

- ・自然災害管理計画調査

【個別専門家】

- ・水資源政策アドバイザー

(4) 他の援助機関の対応

世界銀行は、CPS :Country Partnership Strategy (2009～2012) において、公共機関に対する投資が開発成果発現に必要であり、その中でも「持続的な環境と災害被害の軽減」を5つの主要取組分野の一つに位置づけている。特に、災害分野に関しては、行動計画や災害保障の枠組策定において、国家開発企画庁 (BAPPENAS) 及び国家災害対策庁 (BNPB) の能力強化が重要であるとしている。現在は、「水資源・灌漑セクター管理プログラム」(Water Resources Irrigation Sector Management Program) 等を通じ、治水セクターの維持管理体制の改善 (維持管理機能の水利組合への移管・強化) を支援している。

アジア開発銀行は、Country Strategy and Program Update (2006～2009) において、近年の大規模な洪水被害に鑑み、統合的水資源管理体制の構築を支援していく方針を掲げている。これまで、水資源管理、災害管理機能強化のプロジェクト形成のため、「流域洪水対策事業」(Flood Management in Selected River Basins) や「統合的チタルム流域水資源管理事業」(Integrated Citarum Water Resources Management) といった技術協力を実施している。

3. プロジェクト全体計画概要

※下線部：本無償資金協力に直接関係する成果、活動及び投入

(1) プロジェクト全体計画の目標 (裨益対象の範囲及び規模)

プルート排水機場が受け持つ、ジャカルタ首都中心部の約 34km² の排水区域の雨水および下水の排水調整機能の回復と防潮機能の回復により、プルート排水機場排水区域における雨水排水機能が回復される。

(2) プロジェクト全体計画の成果

- ①東排水機場が整備される
- ②排水機場前面の防潮堤が整備される

(3) プロジェクト全体計画の主要活動

- ①東排水機場および防潮堤を整備する
- ②プロジェクト運営のための人員を配置する
- ③上記施設を使用して運転・保守・維持管理を実施する

(4) 投入 (インプット)

- 1) 日本側 (=本案件) : 無償資金協力 20.33 億円

2) 相手国側

ア) 必要な人員：12名

イ) 整備した施設の運転・保守・維持管理に係る経費（約3,700万円/年）

(5) 実施体制

監督責任機関（主管官庁）：公共事業省水資源総局

実施機関：公共事業省水資源総局およびジャカルタ特別州公共事業局

4. 無償資金協力案件の内容

(1) サイト

ジャカルタ特別州北ジャカルタ地区プルイット排水機場

(2) 概要

1) 東排水機場建屋の建設

（鉄筋コンクリート造（鋼管杭基礎）、3階建、延床面積約400m²）

2) 東排水機場の排水設備の設置

（排水ポンプ設備3基（縦軸斜流形式5.0m³/秒/基）、地上配管方式（口径1500mm）、非常用発電設備1式（1500kVA）、除塵機3台、水平ベルトコンベヤ1台）

3) 防潮堤の改修

（堤防延長約145m、自立式鋼管矢板形式護岸）

(3) 相手国側負担事項

1) 工事用資機材搬入用道路の整備

2) 既存施設撤去後の廃棄物の処分地の準備および廃棄物の管理・処分

3) 電力供給系統の付け替え

4) 東排水機場改修工事期間中の代替排水設備の設置

5) 非正規繫留船舶の移動

6) 海上警察等の施設移設

7) 環境管理計画および環境モニタリング計画の作成、承認取得および実施

(4) 概略事業費

概略事業費 22.03 億円（無償資金協力：20.33 億円、インドネシア国側負担：1.70 億円）

(5) 工期

詳細設計・入札・建設・検査・試運転を含め約34ヶ月（予定）

(6) 貧困、ジェンダー、環境および社会面の配慮

カテゴリ分類はBであり、EIAより簡易な環境管理計画（UKL）と環境モニタリング計画（UPL）

が 2010 年 4 月に承認された。(ジャカルタ市環境局管轄)

5. 外部要因リスク (プロジェクト全体計画の目標の達成に関するもの)

6. 過去の類似案件からの教訓の活用

継続的に維持管理が可能な施設を整備する。
運転・保守・維持管理指導を適切に指導する。

7. プロジェクト全体計画の事後評価に係る提案

(1) プロジェクト全体計画の目標達成を示す成果指標

プルイット排水機場が運転を開始する。(排水能力の回復：現状の $0\text{m}^3/\text{秒}$ → $5\text{m}^3/\text{秒}$ ×2 台= $10\text{m}^3/\text{秒}$ /2 台、降雨確率規模が 1/5 年→1/10 年) また、防潮堤が整備される。

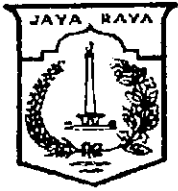
(2) その他の成果指標

特になし

(3) 評価のタイミング

2013 年 9 月以降 (施設稼動開始後)

資料－6 環境社会配慮関連資料



PEMERINTAH PROPINSI DAERAH KHUSUS IBUKOTA JAKARTA

DINAS PEKERJAAN UMUM

JL. Taman Jatibaru No. 1 Telp. 3803302 – 3865546 - 3845266

JAKARTA

Kode Pos 10150

16th December 2009

Number : 11357/1-1.774.137
Characteristic :
Attachment :
Subject : UKL and UPL for the reconstruction of East Pump Station of Pluit in Jakarta

To
Mr. Kenichi TSUKAHARA
Leader of Preparatory Survey Team
Japan International Cooperation Agency (JICA)

Project : The Project for Urgent Reconstruction of East Pump Station of Pluit in Jakarta, Republic Indonesia

Dear Mr. Kenichi TSUKAHARA,

Based on the discussion with BPLHD on 10th December 2009, we, Public Works in the City of Jakarta (DINAS PU DKI Jakarta), would like to notice that AMDAL is not necessary because this Project is reconstruction of the existing facility, referring to Decision of Jakarta City Governor No. 99 Year 2002 on Execution Mechanism of Environmental Impact Assessment (AMDAL) and Environmental Management Plan (UKL) and Environmental Monitoring Plan (UPL) and Decision of Jakarta City Governor No. 190 Year 2002 on Provision of Types of Business and/or Activity Plans for UKL and UPL. However, Environmental Management Plan (Upaya Pengelolaan Lingkungan, hereinafter referred as "UKL) and Environmental Monitoring Plan (Upaya Pemantauan Lingkungan, hereinafter referred as "UPL") need to be prepared and implemented for implementation of this Project.

In order to receive the approval of UKL and UPL by the end of June 2010, we will prepare UKL and UPL from January 2010, and submit them by April 2010 after consultation with North Jakarta office of BPLHD.

Thank you for your kind cooperation and attention.

Head of Public Works Jakarta City
Province of DKI JAKARTA
(Dinas PU DKI Jakarta)



c.c. :

1. Deputy of Public Works Jakarta City Province of DKI Jakarta
2. Head of Secretariat of Public Works Jakarta City Province of DKI Jakarta
3. Head of Maintenance Water Resources of Public Works Jakarta City Province of DKI Jakarta
4. Head of Management Water Resources of Public Works Jakarta City Province of DKI Jakarta



PEMERINTAH PROPINSI DAERAH KHUSUS IBUKOTA JAKARTA

DINAS PEKERJAAN UMUM

JL. Taman Jatibaru No. 1 Telp. 3803302 – 3865546 - 3845266

JAKARTA

Kode Pos 10150

16th December 2009

Number : 11350 / - 1795.2
Characteristic :
Attachment : 4 Pages
Subject : Submission of
Environmental Checklist

To
Mr. Kenichi TSUKAHARA
Leader of Preparatory Survey Team
Japan International Cooperation Agency (JICA)

**Project : The Project for Urgent Reconstruction of East Pump Station of Pluit in Jakarta,
Republic Indonesia**

Dear Mr. Kenichi TSUKAHARA,

In response to a request from Japan International Cooperation Agency (JICA) through the Preparatory Survey Team, we, Public Works in the City of Jakarta (DINAS PU DKI Jakarta), would like to submit the Environmental Checklist as attached for the Project for Urgent Reconstruction of East Pump Station of Pluit in Jakarta in the Republic of Indonesia under the Japan's grant aid.

Thank you for your kind cooperation and attention.

Head of Public Works Jakarta City
Province of DKI JAKARTA
(Dinas PU DKI Jakarta)



c.c. :

1. Deputy of Public Works Jakarta City Province of DKI Jakarta
2. Head of Secretariat of Public Works Jakarta City Province of DKI Jakarta
3. Head of Maintenance Water Resources of Public Works Jakarta City Province of DKI Jakarta
4. Head of Management Water Resources of Public Works Jakarta City Province of DKI Jakarta

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
1 Permits and Explanation	(1) EIA and Environmental Permits	<input type="checkbox"/> Have EIA reports been approved by authorities of the host country's government? <input type="checkbox"/> Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? <input type="checkbox"/> In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government? <input type="checkbox"/> Are contents of the project and the potential impacts adequately explained to the public based on appropriate procedures, including information disclosure? Is understanding obtained from the public? <input type="checkbox"/> Are proper responses made to comments from the public and regulatory authorities?	<p>Based on the discussion with Environment Agency of City of Jakarta (BPLHD) on December 10th, 2009, it was found that the Project needed to submit Environmental Management Plan (UKL) and Environmental Monitoring Plan (UPL) instead of EIA (AMDAL) report. It is expected that and Public Works of City of Jakarta (DINAS PU DKI Jakarta) will prepare UKL/UPL from January 2010 and submit to North Jakarta office of BPLHD by April 2010.</p> <p>North Jakarta office of BPLHD will examine UKL/UPL and notice the result to DINAS PU DKI Jakarta. Notice will be issued by June, 2010.</p> <p>Based on the discussion with BPLHD, UKL/UPL will be approved unconditionally.</p> <p>Since the Project is to reconstruct the existing East Pump Station, there are not any other required environmental permits for the Project</p> <p>Since this Project is not subject for AMDAL, execution of public consultation meeting is not required. However, DINAS PU DKI Jakarta will arrange and conduct the explanation to the residents about the Project, construction schedule and method before the commencement of the Project for the smooth implementation of the Project.</p> <p>In case that DINAS PU DKI Jakarta receives any comments from the public and regulatory authorities, DINAS PU DKI Jakarta is willing to discuss and arrange any necessary procedure to implement the Project appropriately.</p>
	(2) Explanation to the Public	<input type="checkbox"/> Is there a possibility that changes in river flow drawdown (mainly water level drawdown) due to the project will cause areas that do not comply with the country's ambient water quality standards?	<p>Since the Project is to reconstruct the existing East Pump Station, there is no possibility that changes in river flow and water level drawdown due to the Project.</p>
	(3) Subsidence	<input type="checkbox"/> In the case of that large volumes of excavated/dredged materials are generated, are the excavated/dredged materials properly treated and disposed of in accordance with the country's standards? <input type="checkbox"/> Is there a possibility that the excavation of waterways will cause groundwater level drawdown or subsidence? Are adequate measures taken, if necessary?	<p>Solid wastes from the reconstruction will be disposed in the final disposal site complying with the waste management law of Indonesia and regulation of Jakarta City.</p> <p>There is no possibility to cause groundwater level drawdown or subsidence by the Project.</p>
2 Mitigation Measures	(1) Water Quality	<input type="checkbox"/> In the case of that large volumes of excavated/dredged materials are generated, are the excavated/dredged materials properly treated and disposed of in accordance with the country's standards? <input type="checkbox"/> Is there a possibility that the excavation of waterways will cause groundwater level drawdown or subsidence? Are adequate measures taken, if necessary?	<p>Solid wastes from the reconstruction will be disposed in the final disposal site complying with the waste management law of Indonesia and regulation of Jakarta City.</p> <p>There is no possibility to cause groundwater level drawdown or subsidence by the Project.</p>

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
3 Natural Environment	(1) Protected Areas	<input type="checkbox"/> Is the project site located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas? <input type="checkbox"/> Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)?	The planned project site is the same as the existing site of East Pump Station, and the existing site is not located in protected area in the site designated by the Indonesian laws and international treaties and conventions. The planned project site does not encompass primeval forests, tropical rain forests, ecologically valuable habitats.
	(2) Ecosystem	<input type="checkbox"/> Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions? <input type="checkbox"/> If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem? <input type="checkbox"/> Is there a possibility that hydrologic changes, such as reduction of the river flow, and seawater intrusion up the river will adversely affect downstream aquatic organisms, animals, vegetation, and ecosystems?	The planned project site does not encompass the protected habitats of endangered species designated by the Indonesian law and international treaties and conventions Any significant ecological impacts are not anticipated by the Project. Since the Project is to reconstruct the existing East Pump Station, there is no possibility to affect downstream aquatic organisms, animals, vegetation, and ecosystems.
	(3) Hydrology	<input type="checkbox"/> Is there a possibility that the changes in water flows due to the project will adversely affect aquatic environments in the river? Are adequate measures taken to reduce the impacts on aquatic environments, such as aquatic organisms?	Since the Project is to reconstruct the existing East Pump Station, there is no possibility of the changes in water flows.
	(4) Topography and Geology	<input type="checkbox"/> Is there a possibility that hydrologic changes due to the project will adversely affect surface water and groundwater flows? <input type="checkbox"/> Is there a possibility that excavation of rivers and channels will cause a large-scale alteration of the topographic features and geologic structures in the surrounding areas?	Since the Project is to reconstruct the existing East Pump Station, there is no possibility of hydrologic changes due to the Project. Since the Project is to reconstruct the existing East Pump Station, there is no possibility of a large-scale alteration of the topographic features and geologic structures in the surrounding areas.

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
		<input type="checkbox"/> Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement? <input type="checkbox"/> Is adequate explanation on relocation and compensation given to affected persons prior to resettlement? <input type="checkbox"/> Is the resettlement plan, including proper compensation, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement? <input type="checkbox"/> Does the resettlement plan pay particular attention to vulnerable groups or persons, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples? <input type="checkbox"/> Are agreements with the affected persons obtained prior to resettlement? <input type="checkbox"/> Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?	<p>The planned project site is the same as the existing site of East Pump Station, and the existing site is owned by DINAS PU DKI Jakarta. Since there is no dwellings in the site including illegal habitants, any resettlements will not be caused by the Project.</p> <p>Since resettlement will not be caused by the Project, any explanation on relocation to the affected people is not required.</p> <p>Since resettlement will not be caused by the Project, the resettlement plan is not required.</p> <p>Since resettlement will not be caused by the Project, the resettlement plan is not required.</p> <p>Since resettlement will not be caused by the Project, the agreement with the affected persons is not required.</p> <p>Since resettlement will not be caused by the Project, the organization framework is not established to properly implement resettlement.</p>
4 Social Environment	(1) Resettlement	<input type="checkbox"/> Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary? <input type="checkbox"/> Is there a possibility that the amount of water (e.g., surface water, groundwater) used by the project will adversely the downstream fisheries and other water uses? <input type="checkbox"/> Is there a possibility that water-borne or water-related diseases (e.g., schistosomiasis, malaria, filariasis) will be introduced? <input type="checkbox"/> Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage sites? Are adequate measures considered to protect these sites in accordance with the country's laws?	<p>Since the Project is to reconstruct the existing East Pump Station, there is no possibility to adversely affect the living conditions of inhabitants.</p> <p>It is necessary to relocate the anchored ships in front of East Pump Station. DINAS PU DKI Jakarta will be in charge of this relocation before commencement of the construction work by Japanese side (refer to M/D dated on November 18th, 2009). And it is expected that DINAS PU DKI Jakarta will announce and explain for residents and ship owners from January 2011 and complete the relocation by April 2011.</p> <p>Since the Project is to reconstruct the existing East Pump Station, there is no possibility that water-borne or water-related diseases will be introduced.</p> <p>There is no possibility that the Project will damage the local archeological, historical, cultural, and religious heritage sites since there is no such site in and around the planned project site.</p> <p>Since the Project is to reconstruct the existing East Pump Station, there is no possibility that the Project will adversely affect the local landscape.</p> <p>Since the Project is to reconstruct the existing East Pump Station, there is no residence of ethnic minorities and indigenous peoples in and near the planned project site.</p> <p>Since the Project is to reconstruct the existing East Pump Station, there is no residence of ethnic minorities and indigenous peoples in and near the planned project site.</p>
	(2) Living and Livelihood		
	(3) Heritage		
	(4) Landscape		
	(5) Ethnic Minorities and Indigenous Peoples	<input type="checkbox"/> Does the project comply with the country's laws for rights of ethnic minorities and indigenous peoples? <input type="checkbox"/> Are considerations given to reduce the impacts on culture and lifestyle of ethnic minorities and indigenous peoples?	

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
	(1) Impacts during Construction	<input type="checkbox"/> Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)? <input type="checkbox"/> If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts? <input type="checkbox"/> If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?	DINAS PU DKI Jakarta will examine the proper monitoring plan with the Consultant, and supervise the Contractor to conduct the environmental monitoring to reduce and mitigate the environmental impacts during the construction. There is no possibility that the construction activities will adversely affect the natural environment.
5 Others		<input type="checkbox"/> If necessary, is health and safety education (e.g., traffic safety, public health) provided for project personnel, including workers? <input type="checkbox"/> Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts? <input type="checkbox"/> Are the items, methods and frequencies included in the monitoring program judged to be appropriate? <input type="checkbox"/> Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)? <input type="checkbox"/> Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?	DINAS PU DKI Jakarta will examine the proper monitoring plan with the Consultant, and supervise the Contractor to conduct the environmental monitoring to reduce and mitigate the social impacts during the construction. DINAS PU DKI Jakarta will examine the proper safety education program with the Consultant, and supervise the Contractor to conduct it during the construction. DINAS PU DKI Jakarta will examine and prepare the monitoring plan for the environmental items, that are considered to have potential impacts with related authorities and Consultant. After that, DINAS PU DKI Jakarta will supervise the Contractor to conduct the monitoring plan appropriately. DINAS PU DKI Jakarta will examine the necessary items, methods and frequencies included in the monitoring program and prepare the appropriate monitoring plan with the Consultant. DINAS PU DKI Jakarta will be responsible to conduct the monitoring in cooperation with Ministry of Public Works (PU). DINAS PU DKI Jakarta plans to submit the monthly report as a report to PU and other regulatory authorities.
6 Note	Note on Using Environmental Checklist	If necessary, the impacts to transboundary or global issues should be confirmed (e.g., the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	Any transboundary or global issues are not assumed during the construction of the Project.

1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are made, if necessary.

In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).
 2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which it is located.

資料-6-3 環境社会配慮に関する法規制

1. 「イ」国の環境法

「イ」国における環境関連法規の基本は、1997年に策定された法律第23号の環境管理法（Environmental Control Law No. 23, 1997）である。この法律は1982年に制定された旧環境管理法を大幅に改訂したもので、①事業活動による環境規制の強化、環境汚染に対する罰則の強化、③環境紛争処理に関する規定の強化、④国民の環境情報に関する権利等などの内容を盛り込んでいる。本プロジェクトに関連する主な環境法・規則は表6-3-1に、またジャカルタ特別州の環境法・規則は表6-3-2に示す。

表 6-3-1 「イ」国における主な環境法・規則

No.	Category	Law/Regulation/Decree
1	Law	Waste Management Law No. 18 Year 2008
2		Environmental Control Law No. 23 Year 1997
3	Governmental Regulation	Government Regulation No. 38 Year 2007 on Responsibility of Government, Provincial Government, Regency/Municipal Government
4		Government Regulation No. 16 Year 2005 on Development of Drinking Water
5	Governmental Decree	Government Decree No. 82 2001 on Prevention of Water Pollution and Control of Water Quality
6		Government Decree No. 41 Year 1999 on Prevention of Air Pollution
7	Ministerial Regulation	Regulation of Minister for Public Works No. 21/PRT/M Year 2006 on the National Policy and Strategy on the Development of Waste Management System (KSNP-SPP)
8	Ministerial Decree	Decree of State Minister for Environment No. 50 Year 1996 on Offensive Odors Standards
9		Decree of State Minister for Environment No. 49 Year 1996 on Vibration standards
10		Decree of State Minister for Environment No. 48 Year 1996 on Noise Standards
11		Decree of State Minister for Environment No. 51 Year 1995 on Water Effluent Standards for Industrial Activities
12		Decree of State Minister for Environment No. 13 Year 1995 on Water Effluent Standards from Fixed Source

表 6-3-2 ジャカルタ特別州における主な環境法・規則

No.	Category	Law/Regulation/Decree
1	By-Law	By-law of Jakarta City Governor No. 2 Year 2005 on Control of Air Contamination
2	Governor Regulation	Regulation of Jakarta City Governor No. 76 Year 2009 on Management of Hazardous Wastes
3		Regulation of Jakarta City Governor No. 122 Year 2005 on Domestic Waste Management
4	Governor Decree	Decree of Jakarta City Governor No. 670 Year 2000 on Emission Standards
5	Governor Decision	Decision of Jakarta City Governor No. 551 Year 2001 on Standards for Air Quality and Noise
6		Decision of Jakarta City Governor No. 30 Year 1999 on Permission of Liquid Waste Discharge
7	Governor Permission	Permission of Jakarta City Governor No. 2863 Year 2001 on Liquid Waste Discharge from Business and/or Activity Plans Determined by Environmental Impact Assessment (AMDAL)

2. 「イ」国における EIA の手続き

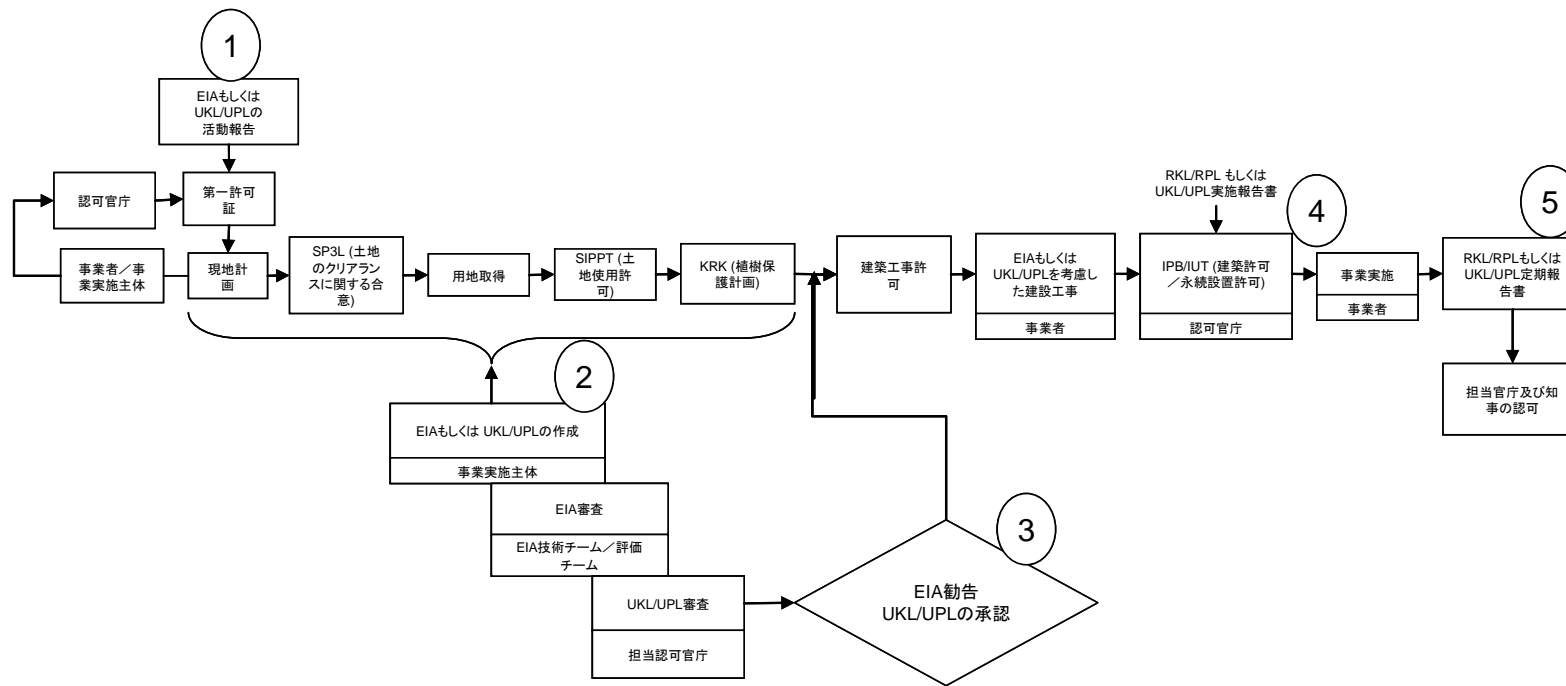
「イ」国の環境影響評価（AMDAL：環境影響評価を意味するインドネシア語の略称。）の手続きについては、1999年政令27号（Government Regulation on Environmental Impact Assessment No. 27, 1999）で規定されており環境影響評価の対象となる事業および活動については、2001年環境大臣令17号（Decree of State Ministry for the Environment on Types of Business and/or Activity Plans No. 17, 2001）で定められている。AMDALに関する主な法・規則は表6-3-3に、またジャカルタ特別州の法・規則は表6-3-4に示す。AMDAL手続きの流れの概略は図6-3-1に示す。図6-3-1からも明らかな通り、AMDALはプロジェクトの規模に基づいて判断されるため、「イ」国におけるEIA手続きはプロジェクトの実施場所と規模が確定した後に開始される。

表 6-3-3 「イ」国における AMDAL に関する法・規則

No.	Category	Law/Regulation/Decree
1	Governmental Decree	Government Decree No. 27 Year 1999 on Environmental Impact Assessment (AMDAL)
2	Ministerial Decree	Decree of State Minister for the Environment No. 17 Year 2001 on Provision of Types of Business and/or Activity Plans for Environmental Impact Assessment (AMDAL)
3		Decree of State Minister for the Environment No. 42 Year 2000 on Form of Members of Assessment Committee and Technical Committee for Environmental Impact Assessment (AMDAL)
4		Decree of State Minister for Environment No. 41 Year 2000 on Guidelines for Local Assessment Committee for Environmental Impact Assessment (ADMAL)
5		Decree of State Minister for Environment No. 40 Year 2000 on Guidelines for System of Assessment Committees for Environmental Impact Assessment (AMDAL)
6		Decree of State Minister for Environment No. 9 2000 on Guidelines for Preparation of Environmental Impact Assessment (AMDAL)
7		Decree of State Minister for Environment No. 8 Year 2000 on Public Involvement and Information Disclosure for Environmental Impact Assessment (AMDAL)
8		Decree of State Minister for Environment No. 2 Year 2000 on Guidelines for Environmental Impact Assessment (AMDAL)

表 6-3-4 ジャカルタ特別州における AMDAL に関する法・規則

No.	Category	Law/Regulation/Decree
1	Governor Decision	Decision of Jakarta City Governor No. 189 Year 2002 on Provision of Types of Business and/or Activity Plans for Environmental Management Plan (UKL) and Environmental Monitoring Plan (UPL)
2		Decision of Jakarta City Governor No. 99 Year 2002 on Execution Mechanism of Environmental Impact Assessment (AMDAL) and Environmental Management Plan (UKL) and Environmental Monitoring Plan (UPL)
3		Decision of Jakarta City Governor No. 76 Year 2001 on Guidance of Public Improvement and Information Disclosure for Environmental Impact Assessment (AMDAL)
4		Decision of Jakarta City Governor No. 57 Year 2001 on Form of Assessment Committee for Environmental Impact Assessment (AMDAL)



備考:

1. 認可官庁は作成すべき環境レポート(EIAもしくはUKL/UPL)の種類を通知する
2. EIAもしくはUKL/UPLの作成
3. 建築工事許可にEIAもしくはUKL/UPLが必要となる
4. EIAもしくはUKL/UPLを考慮した開発工事
5. RKL/RPLもしくはUKL/UPLの実施報告
6. RKL/RPLもしくはUKL/UPLの実施定期報告

出所：Decision of Jakarta City Governor No. 99 Year 2002 on Execution Mechanism of Environmental Impact Assessment (AMDAL) and Environmental Management Plan (UKL) and Environmental Monitoring Plan (UPL)より調査団作成

図 6-3-1 AMDAL 手続きの流れ

(1) AMDAL の対象となる事業

AMDAL が必要とされる事業では、以下の 4 つの書類を作成し、所管官庁の承認を受けなければならない。

- ① 環境影響評価実施計画書
- ② 環境影響評価書
- ③ 環境管理計画書（以下、RKL）
- ④ 環境モニタリング計画書（以下、RPL）

(2) AMDAL の所管官庁

イ国における AMDAL の所管官庁は、原則として地方政府（市、県等）であるが、事業種類や事業実施箇所あるいはその所管官庁が AMDAL を実施可能かどうかにより、州政府、中央政府となるケースもある。AMDAL の所管官庁を表 5 に示す。本プロジェクトの所轄官庁は、地方政府となる。

表 6-3-5 AMDAL の所管官庁

中央政府	州政府	地方政府
1)潜在的に環境負荷を与える事業または安全・国防にかかわる事業 <ul style="list-style-type: none"> ・原子力発電所建設・運営 ・海底掘削 ・人工衛星発射技術 ・遺伝子工学技術 ・石油・ガス開発 ・石油精製所建設 ・放射性鉱物の採掘 ・航空機産業施設建設 ・軍事産業施設建設 ・爆発物産業施設建設 ・輸入廃棄物を原材料とする産業施設建設 <ul style="list-style-type: none"> ・国際空港建設 ・港湾施設建設 ・有害廃棄物処理施設建設 2)2 つ以上の州にまたがる事業 3)他地域の紛争地域に位置する事業 4)海域 12 マイル以上に位置する事業 5)他国との国境にまたがる事業	1)潜在的に環境負荷を与える事業 <ul style="list-style-type: none"> ・パルプ産業施設建設 ・セメント産業施設建設 ・石油化学産業施設建設 ・森林産業施設建設 ・植林事業のための開墾 ・農業・園芸事業のための開墾 ・発電施設建設(水力,蒸気,地熱,ディーゼル発電) ・ダム建設 ・空港建設(国際空港除く) ・港湾施設建設 2) 2 つ以上の市,県にまたがる事業 3)海域 4~12 マイル以上に位置する事業 4)地方政府から委任された事業 (州政府では AMDAL ができない事業については,中央政府の環境影響評価委員会の支援を求めることが可能)	1)すべての事業 (地方政府では AMDAL ができない事業については,その権限を州政府に委任することができる)

出所：Decree of State Minister for Environment No. 40 Year 2000 on Guidelines for System of Assessment Committees for Environmental Impact Assessment (AMDAL)より調査団作成

(3) AMDAL の実施を必要としない事業における環境配慮および手続き

環境に対して重大な影響を生じる可能性のある事業については、AMDAL の実施が義務付けられているが、AMDAL 実施の義務付けのない事業においても環境影響の対策を講ずる必要がある。環境に対してある一定以上の影響を生じる可能性がある事業については、環境管理計画（以下 UKL: Upaya Pengelolaan Lingkungan）及び環境モニタリング計画（以下 UPL: Upaya Pemantauan Lingkungan）の提出が義務付けられている。日本で行われるような技術指導（環境基準を満たしているかなど）は UPL 及び UKL で行われる。UKL 及び UPL の提出が必要かどうかは、各地方政府が事業の種類・規模を定めている。UKL 及び UPL は、AMDAL 手続きの RKL 及び RPL の簡略版である。さらに、UKL 及び UPL の提出を必要としない事業については、SPPL と呼ばれる簡略な書類の提出が必要である。

資料-6-4 スコーピング案

Table 2 Estimated Adverse Environmental and Social Impacts (as of before the preparatory survey)

1. Preparation and Construction Period				
		Item	Rating	Reasons
Social Environment: "Children's Right" may be related to all social environment criteria. *Impacts on "Gender" and	1	Involuntary Resettlement	D	There is no possibility of involuntary resettlement since there are not any residences including illegal residences in the site area.
	2	Local Economy such as Employment and Livelihood, etc.	C	There is a possibility to make some arrangements regarding the utilization rights and relocating illegal anchorage ships and boats since the anchorage area is in front of the sea tide dike. And it might be necessary to make some arrangements for illegal habitants in case that the Project might have an adverse impact to them.
	3	Land Use and Utilization of Local Resources	C	There is a possibility to affect on the living environment since a partial private road is planned to be used as a part of access road.
	4	Social Institutions such as Social Infrastructure and Local Decision - making Institutions	D	There is no possibility since the site is the same place as existing East Pump Station.
	5	Existing Social Infrastructures and Services	D	There is no possibility to affect the passage of local residents since a detour will be provided constructed even though a part of this passage is planned to be used as a part of access road.
	6	The Poor, Indigenous and Ethnic people	D	There is no possibility since the site is the same place as existing East Pump Station.
	7	Misdistribution of Benefit and Damage	D	There is no possibility of misdistribution of benefit and damage since the site is a place of existing East Pump Station and there are no production and commercial activities in the site.
	8	Cultural heritage	D	There are not any cultural heritages in the site.
	9	Local Conflicts of Interest	D	There is no possibility of local conflicts of interest as rehabilitation of East Pump Station.
	10	Water Usage or Water Rights and Communal Rights	D	Ministry of Public Works has a right of ownership for rehabilitation of East Pump Station. There is no possibility of water rights and communal rights.
	11	Sanitation	D	Since the Project will provide a temporal toilet and manage wastes appropriately for the increase of workers, there is no possibility to affect on sanitation.

	12	Hazards (risk) Infectious Diseases such as HIV/AIDS	D	Since the Project is to reconstruct the existing East Pump Station, there is no possibility of hazards and infectious diseases.
Natural Environment	13	Topography and Geographical Features	C	It is necessary to confirm topography and geographical features by topographical and geographical surveys because there is a limited available topography and geographical data about the existing East Pump Station.
	14	Soil Erosion	D	There is no possibility of soil erosion because of rehabilitation of East Pump Station.
	15	Groundwater	D	There is no possibility of impact on groundwater because of rehabilitation of East Pump Station.
	16	Hydrological Situation	D	There is no possibility of impact on hydrological situation because of rehabilitation of East Pump Station.
	17	Coastal zone	D	There is no possibility of impact on coastal zone because of rehabilitation of existing East Pump Station.
	18	Flora, Fauna and Biodiversity	D	There is no possibility of impact on biodiversity because of rehabilitation of East Pump Station.
	19	Meteorology	D	There is no possibility of impact on meteorology because of rehabilitation of East Pump Station.
	20	Landscape	D	There is no possibility of impact on landscape because of rehabilitation of existing East Pump Station.
	21	Global Warming	D	The Project will not affect adversely since the green house gas will be reduced by improving the pump performance and so on.
Pollution	22	Air Pollution	B	Air pollutants can be discharged by vehicles during construction.
	23	Water Pollution	B	The Project will have a possibility of water pollution by construction of sea tide dike and removal of cofferdam.
	24	Soil Contamination	D	Since the Project will not use materials which have any contaminants for soil, there is no possibility of soil contamination.
	25	Waste	B	It is necessary to examine the appropriate treatment method and to investigate the present situation and related regulation for wastes to be generated as a result of demolition of existing facilities.
	26	Noise and Vibration	B	Since the Project will have a possibility of noise and vibration, it is necessary to provide countermeasure against insulation of noise and vibration, to arrange the working hours of heavy equipment and so on.
	27	Ground Subsidence	D	There is no possibility of ground subsidence by the construction.

	28	Offensive Odor	D	There is no possibility of offensive odor because of rehabilitation of East Pump Station.
	29	Bottom Sediment	D	There is no possibility of impact on bottom sediment because of rehabilitation of East Pump Station.
	30	Accidents	B	There is a possibility of traffic accidents by vehicles for construction.
2. Operation Period				
		Item	Rating	Reasons
Social Environment: "Impacts on "Gender" and "Children's Right" may be related to all social environment criteria.	1	Involuntary Resettlement	D	Involuntary resettlement is inconceivable for the use of East Pump Station.
	2	Local Economy such as Employment and Livelihood, etc.	D	Adverse impact is inconceivable since the risk will be reduced by the improvement of the drainage function.
	3	Land Use and Utilization of Local Resources	D	Safety for land use will be increased by improvement of the drainage function.
	4	Social Institutions such as Social Infrastructure and Local Decision - making Institutions	D	There is no possibility of impact on social institutions by the use of East Pump Station.
	5	Existing Social Infrastructures and Services	D	Safety for existing social infrastructures and services will be increased by improvement of the drainage function.
	6	The Poor, Indigenous and Ethnic people	D	There is no possibility of impact on the poor, indigenous and ethnic people by the use of East Pump Station.
	7	Misdistribution of Benefit and Damage	D	There is no possibility of misdistribution of benefit and damage since there are no production and commercial activities in the site.
	8	Cultural heritage	D	There are not any cultural heritages in the site.
	9	Local Conflicts of Interest	D	There is no possibility of local conflicts of interests for the use of East Pump Station.
	10	Water Usage or Water Rights and Communal Rights	D	Since the right of ownership will be transferred from Ministry of Public Works to DKI, there is no possibility of impact on water rights and communal rights
	11	Sanitation	D	Sanitation will be improved by the improvement of the drainage function.
	12	Hazards (risk) Infectious Diseases such as HIV/AIDS	D	There is no possibility of hazards and infectious diseases for the use of East Pump Station.
E n v i r o	13	Topography and Geographical Features	D	There is no possibility of impact on topography and geographical features by the use of East Pump Station.
	14	Soil Erosion	D	There is no possibility of soil erosion by the use of East Pump Station.

	15	Groundwater	D	There is no possibility to affect groundwater by the use of East Pump Station.
	16	Hydrological Situation	D	There is no possibility to affect hydrological situation by the use of East Pump Station.
	17	Coastal zone	D	There is no possibility to affect coastal zone by the use of East Pump Station.
	18	Flora, Fauna and Biodiversity	D	There is no possibility to affect biodiversity for the use of East Pump Station.
	19	Meteorology	D	There is no possibility to affect meteorology by the use of East Pump Station.
	20	Landscape	D	There is no possibility to affect landscape by the use of East Pump Station.
	21	Global Warming	D	Use of East Pump Station will not affect adversely to global warming since the green house gas will be reduced by improving the pump performance and so on.
Pollution	22	Air Pollution	D	There is no possibility of air pollution by the use of East Pump Station.
	23	Water Pollution	D	There is no possibility of water pollution by the use of East Pump Station.
	24	Soil Contamination	D	There is no possibility of soil contamination by the use of East Pump Station.
	25	Waste	D	There is no possibility to generate wastes by the use of East Pump Station.
	26	Noise and Vibration	D	There is no possibility of noise and vibration by the use of East Pump Station.
	27	Ground Subsidence	D	There is no possibility of impact associated with ground subsidence in the East Pump Station.
	28	Offensive Odor	D	There is no possibility to generate offensive odor by the use of East Pump Station.
	29	Bottom Sediment	D	There is no possibility to generate bottom sediment by the use of East Pump Station.
	30	Accidents	D	There is no possibility of accidents by the use of East Pump Station.

Rating:

A: Serious impact is expected, B: Some impact is expected, C: Extent of impact is unknown, D (or No Mark): No impact is expected. IEE/EIA is not necessary.

資料-6-5 環境社会配慮における留意事項

1. 施設配置の検討

ポンプなどの稼働に伴い騒音や振動が懸念される施設については、施設敷地内の中央部に配置することにより、周辺への影響を最小化するよう配慮する。

2. 船舶の移動のための説明方法

DINAS PU DKI Jakarta は通知・説明会を自治会長と協力し、船舶の移動を 2011 年 4 月までに完了させるという計画である。

対象	:	船舶停泊地の移動により影響を受けることが懸念される個人・団体 (船舶所有者、周辺住民、等)
説明方法	:	自治会長と協力して通知・説明会の実施
説明内容	:	本排水機場復旧の目的、工事方法・期間、移動場所・期間、等
説明の時期	:	2011 年 1 月から開始

3. 施工中の周辺住民への影響低減のための対策の立案

施工中に想定される周辺住民への影響については、その回避・緩和策を検討し、適切に実施されなければならない。影響の回避・緩和策については、「2-2-5 (2) プロジェクト実施による環境社会面への影響」にて述べる。

4. 施工計画について周辺住民への説明方法

施工計画についての住民説明について DINAS PU DKI Jakarta に確認したところ、「イ」国において公共事業を実施する際、工事内容や計画について事前に住民に説明する必要はないとのことであった。

また、「イ」国環境法及び EIA ガイドラインによると、AMDAL が必要な事業についてはステークホルダーミーティングが必要であるが、本プロジェクトは EIA が不要であるため、ステークホルダーミーティングなどの住民説明会は不要である。しかしながら、本プロジェクトの円滑な実施を考慮し、施工計画について下記対象・内容について住民説明を行うことを DINAS PU DKI Jakarta と合意した。

対象	:	本排水機場建設時に影響を受けることが懸念される個人・団体 (周辺住民、宗教施設関係者、等)
説明内容	:	本排水機場復旧の目的、工事方法・期間、想定される環境社会影響 と回避策・モニタリング計画、等
説明の時期	:	本排水機場建設工事の開始前

5. プロジェクト実施による環境社会面への影響

(1) 環境社会面への影響に関する準備調査前後の比較

本プロジェクトにおいて最終的に決定した計画に関して、準備調査前に JICA 環境社会配慮ガイドラインに基づいて初期環境調査 (IEE) レベルの環境社会配慮調査を実施した。準備調査前の IEE レベルの環境社会配慮調査結果と準備調査後の調査結果について、表 6-4-1 に比較を示す。

(2) 主な環境影響に対する回避・緩和策とモニタリング計画

本プロジェクト実施における主な環境社会影響に対し、準備調査で検討した環境社会影響項目、回避・緩和策及びモニタリング計画を表 6-4-2 に示す。

表 6-5-1 プロジェクト実施により想定される環境社会面への影響（準備調査実施前後の比較）

1. 工事準備・実施期間						
		準備調査前		準備調査後		
Item (影響項目)		Rating (評定)	Reasons (根拠・理由)	Rating (評定)	Reasons (根拠・理由)	
Social Environment: (社会環境)	1	Involuntary Resettlement (非自発的住民移転)	D	不法な住居を含め計画地には住居は存在しておらず、住民移転は想定されない。	D	不法な住居を含め計画地には住居は存在しておらず、住民移転はない。
	2	Local Economy such as Employment and Livelihood, etc (雇用や生計手段等の地域経済)	C	防潮堤前面に非正規船舶停泊地があり、利用権の取り扱い及び船舶の移動に関する調整が生じる可能性がある。また、近隣に非正規居住者の集落が確認されており、調整が生じる可能性がある。	D	防潮堤前面に非正規船舶停泊地があるが、DINAS PU DKI Jakarta により工事開始前までに移動させることになっている。停泊地は非正規であり、補償等は発生しない。近隣の非正規居住者の集落に関しては、工事前に説明会を実施し、騒音等を配慮した施工計画を立てるため、生活環境に影響はない。
	3	Land Use and Utilization of Local Resources (土地利用や地域資源利用)	C	資材搬入道路に関して一部民間住宅地内の道路の借用により、生活環境に影響がある可能性がある。	D	資材搬入道路は、DINAS PU DKI Jakarta が管理する一般道路を使用するため、影響はない。
	4	Social Institutions such as Social Infrastructure and Local Decision-making Institutions (社会関係資本や地域の意思決定機関等の社会組織)	D	計画地は既存の排水機場がある場所であり、影響はないものと想定される。	D	計画地は既存の排水機場がある場所であり、社会関係資本や地域の社会組織への影響はない。
	5	Existing Social Infrastructures and Services (既存の社会インフラや社会サービス)	D	資材搬入道路に関して、防潮堤上の生活道路を利用するが、迂回路を建設するため交通への影響は想定されない。	D	資材搬入道路に関しては排水機場東側の一般道路を使用するため、交通への影響は想定されない。防潮堤上の生活道路について、迂回路が必要になる場合は DINAS DKI Jakarta が迂回路を建設する。
	6	The Poor, Indigenous and Ethnic people (貧困層・先住民族・少数民族)	D	計画地は既存の排水機場がある場所であり、影響はないものと想定される。	D	計画地は既存の排水機場がある場所であり、貧困層・先住民族・少数民族への影響はない。

*Impacts on "Gender" and "Children's Right" may be related to all social environment criteria.	7	Misdistribution of Benefit and Damage (被害と便宜の偏在)	D	計画地は既存の排水機場がある場所であり、生産活動や商店の営業活動は行われていないため、排水機場の改修に伴う裨益不均衡発生の可能性はない。	D	計画地は既存の排水機場がある場所であり、経済活動は行われていないため、裨益不均衡は発生しない。
	8	Cultural heritage (文化遺産)	D	計画地には、遺跡・文化財は存在しない。	D	計画地には、遺跡・文化財は存在しない。
	9	Local Conflicts of Interest (地域内の利害対立)	D	排水機場の改修に伴う利害の対立が発生する可能性は想定されない。	D	既存の排水機場の改修であるため、利害の対立は発生しない。
	10	Water Usage or Water Rights and Communal Rights (水利用、水利権、入会権)	D	排水機場の所有権はPUにあり、利権に関する影響は想定されない。	D	準備調査にて施工中の排水機場の所有権はPUにあることを確認した。
	11	Sanitation (公衆衛生)	D	工事のための従業員の増加に伴い、仮設トイレの設置や適切な廃棄物処理を実施するため公衆衛生への影響は想定されない。	D	工事のための従業員の増加に伴い、仮設トイレの設置や適切な廃棄物処理を実施するため、公衆衛生への影響はない。
	12	Hazards (risk) Infectious Diseases such as HIV/AIDS (災害、HIV/AIDSのような感染症)	D	既存排水機場の改修であるため、災害や感染症が発生する可能性は想定されない。	D	既存排水機場の改修であるため、災害や感染症が発生する可能性はない。
Natural Environment (自然環境)	13	Topography and Geographical Features (地形・地質)	C	既存排水機場の地質資料が少ないため、ボーリング調査によって確認する必要がある。	D	地形に関しては、既存の排水機場の復旧であるため、影響はない。地質に関してはボーリング調査の結果、地表から約40m下がったところに強度の大きい砂礫層があり、その層に基礎杭で指示させるため、地質への影響はない。
	14	Soil Erosion (土壌浸食)	D	排水機場の改修に伴う土壌浸食の影響は想定されない。	D	排水機場の改修による表土の流出等の土壌浸食の影響はない。
	15	Groundwater (地下水)	D	排水機場の改修に伴う地下水への影響は想定されない。	D	排水機場の改修に伴う地下水への影響はない。
	16	Hydrological Situation(湖沼・河川状況)	D	排水機場の改修に伴う河川への影響は想定されない。	D	既存の排水機場の改修であるため、流量の変化等の河川への影響はない。
	17	Coastal zone (海岸・海域)	D	既存の防潮堤を改修するため、海域への影響は想定されない。	D	既存の防潮堤の改修であるため、海域への影響はない。
	18	Flora, Fauna and Biodiversity (動植物、生物多様性)	D	排水機場の改修に伴う動植物への影響は想定されない。	D	既存の排水機場の改修であるため、動植物や生物多様性への影響はない。

	19	Meteorology (気象)	D	排水機場の改修に伴う気象への影響は想定されない。	D	改修する排水機場は高層の建物ではないため、風向の変化等の気象への影響は想定ない。
	20	Landscape (景観)	D	既存排水機場の改修のため、景観への影響の可能性は想定されない。	D	既存排水機場の改修のため、景観への影響はない。
	21	Global Warming (地球温暖化)	D	排水機場の改修によってポンプ性能が向上するなどの温暖化ガスの削減といった影響が想定され、温暖化への負の影響は想定されない。	D	排水機場の改修によってポンプ性能が向上するなどの温暖化ガスの削減といった影響が想定され、温暖化への負の影響はない。
Pollution (汚染)	22	Air Pollution (大気汚染)	B	工事用車両の稼働に伴い、大気汚染物質の発生が想定される。	B	工事用車両の稼働に伴い、廃棄ガスの排出量が増加する。
	23	Water Pollution (水質汚濁)	B	護岸工事および吐き出し水槽の埋め戻し工事による水質汚濁の可能性が考えられる。	B	護岸工事および吐き出し水槽の埋め戻し工事からの濁水による水質汚濁の可能性が考えられる。
	24	Soil Contamination (土壌汚染)	D	施工中に汚染物質を含む材料は使用されないため、土壌汚染の可能性は想定されない。	D	土壌汚染物質を含む材料は使用されないため、土壌汚染の可能性はない。
	25	Waste (廃棄物)	B	既存施設の撤去により発生する廃棄物の処理については関連法令および処理の現況を調査し、適切な処分方法の検討が必要である。	B	既存施設の撤去により建設廃棄物が発生する。ただし、この処理については、DINAS PU DKI Jakarta の所有する仮置き場まで運搬し、その後 DINAS PU DKI Jakarta の責任の下で処分場に運搬されるため、不法投棄等の不適切な処理・処分の可能性はない。
	26	Noise and Vibration (騒音・振動)	B	工事期間中は騒音・振動が想定されることから、影響を緩和するための資機材の搬入および工事实施の時間帯等について考慮する必要がある。	B	工事期間中は工事車両の稼働に伴い騒音・振動が発生する。ただし、影響を緩和するための資機材や施設配置、工事实施の時間帯等について考慮した施工計画とする。
	27	Ground Subsidence (地盤沈下)	D	工事による地盤沈下は発生しないと想定される。	D	本プロジェクト対象地域は、広域地盤沈下が起きている地域であるが、ボーリング調査の結果、地表から約 40m 下がったところに強度の大きい砂礫層があり、その層に基礎杭で支持させるため、本プロジェクトによる地盤沈下については生じない。
	28	Offensive Odor (悪臭)	D	排水機場の改修に伴う悪臭の発生の可能性は想定されない。	D	排水機場の改修に伴う悪臭の発生はない。

	29	Bottom Sediment (沈殿物)	D	排水機場の改修に伴う沈殿物の発生の可能性は想定されない。	D	排水機場の改修に伴う沈殿物の発生はない。
	30	Accidents (事故)	B	工事車両の稼働により交通事故が発生する可能性が想定される。	B	工事車両の稼働により交通事故が発生する可能性が想定される。
	30	Accidents (事故)	D	排水機場の供用に伴う事故の発生の可能性は想定されない。	D	排水機場の供用に伴う事故の発生の可能性はない。
2. 供用期間						
			準備調査前		準備調査後	
Item (影響項目)			Rating (評定)	Reasons (根拠・理由)	Rating (評定)	Reasons (根拠・理由)
Social Environment: (社会環境)	1	Involuntary Resettlement (非自発的住民移転)	D	排水機場の供用に伴う住民移転は想定されない。	D	不法な住居を含め計画地には住居は存在しておらず、住民移転はない。
	2	Local Economy such as Employment and Livelihood, etc (雇用や生計手段等の地域経済)	D	排水機能向上によりリスクが軽減されるため経済活動や生活への負の影響は想定されない。	D	排水機能向上によりリスクが軽減されるため経済活動や生活への負の影響はない。
	3	Land Use and Utilization of Local Resources (土地利用や地域資源利用)	D	排水機能が向上することにより、安全性が改善される。	D	排水機能が向上することにより、安全性が改善される。
	4	Social Institutions such as Social Infrastructure and Local Decision-making Institutions (社会関係資本や地域の意思決定機関等の社会組織)	D	排水機場の供用に伴う影響はないものと想定される。	D	排水機場の供用に伴う社会関係資本や地域の社会組織への影響はない。
	5	Existing Social Infrastructures and Services (既存の社会インフラや社会サービス)	D	排水機能が向上することにより、安全性が改善される。	D	排水機能が向上することにより、安全性が改善される。
	6	The Poor, Indigenous and Ethnic people (貧困層・先住民・少数民族)	D	排水機場の供用に伴う影響は想定されない。	D	排水機場の供用による貧困層・先住民・少数民族への影響はない。

*Impacts on "Gender" and "Children's Right" may be related to all social environment criteria.	7	Misdistribution of Benefit and Damage (被害と便宜の偏在)	D	生産活動や商店の営業活動は行われないため、排水機場の改修に伴う裨益不均衡発生の可能性はない。	D	排水機場では経済活動は行われていないため、排水機場の供用に伴う裨益不均衡は発生しない。
	8	Cultural heritage (文化遺産)	D	対象地には、遺跡・文化財は存在しない。	D	対象地には、遺跡・文化財は存在しない。
	9	Local Conflicts of Interest (地域内の利害対立)	D	排水機場の供用に伴う利害の対立が発生する可能性は想定されない。	D	排水機場の供用による利害の対立は発生しない。
	10	Water Usage or Water Rights and Communal Rights (水利用、水利権、入会権)	D	排水機場の所有権はPUからDKIに移譲され、利権に関する影響は想定されない。	D	準備調査により供用後の排水機場の所有権はPUからDKIに移譲されることを確認した。
	11	Sanitation (公衆衛生)	D	排水機能が向上することにより、保健衛生状態が改善される。	D	排水機能が向上することにより、保健衛生状態が改善される。
	12	Hazards (risk) Infectious Diseases such as HIV/AIDS (災害、HIV/AIDSのような感染症)	D	既存排水機場の改修であるため、災害や感染症が発生する可能性は想定されない。	D	既存排水機場の改修であるため、災害や感染症が発生する可能性はない。
Natural Environment	13	Topography and Geographical Features (地形・地質)	D	排水機場の供用に伴う影響は想定されない。	D	排水機場の供用に伴う地形・地質への影響はない。
	14	Soil Erosion (土壌浸食)	D	排水機場の供用に伴う土壌浸食の影響は想定されない。	D	排水機場の供用による表土の流出等の土壌浸食の影響はない。
	15	Groundwater (地下水)	D	排水機場の供用に伴う地下水への影響は想定されない。	D	排水機場の供用に伴う地下水への影響は想定されない。
	16	Hydrological Situation (湖沼・河川状況)	D	排水機場の供用に伴う河川への影響は想定されない。	D	排水機場の供用に伴う流量の変化等の河川への影響は想定されない。
(自然環境)	17	Coastal zone (海岸・海域)	D	排水機場の供用に伴う海域への影響は想定されない。	D	排水機場の供用に伴う海域への影響はない。
	18	Flora, Fauna and Biodiversity (動植物、生物多様性)	D	排水機場の供用に伴う動植物への影響は想定されない。	D	排水機場の供用に伴う動植物への影響はない。
	19	Meteorology (気象)	D	排水機場の供用に伴う気象への影響は想定されない。	D	排水機場の供用による気象への影響はない。
	20	Landscape (景観)	D	排水機場の供用に伴う景観への影響は想定されない。	D	排水機場の供用に伴う景観への影響は想定されない。

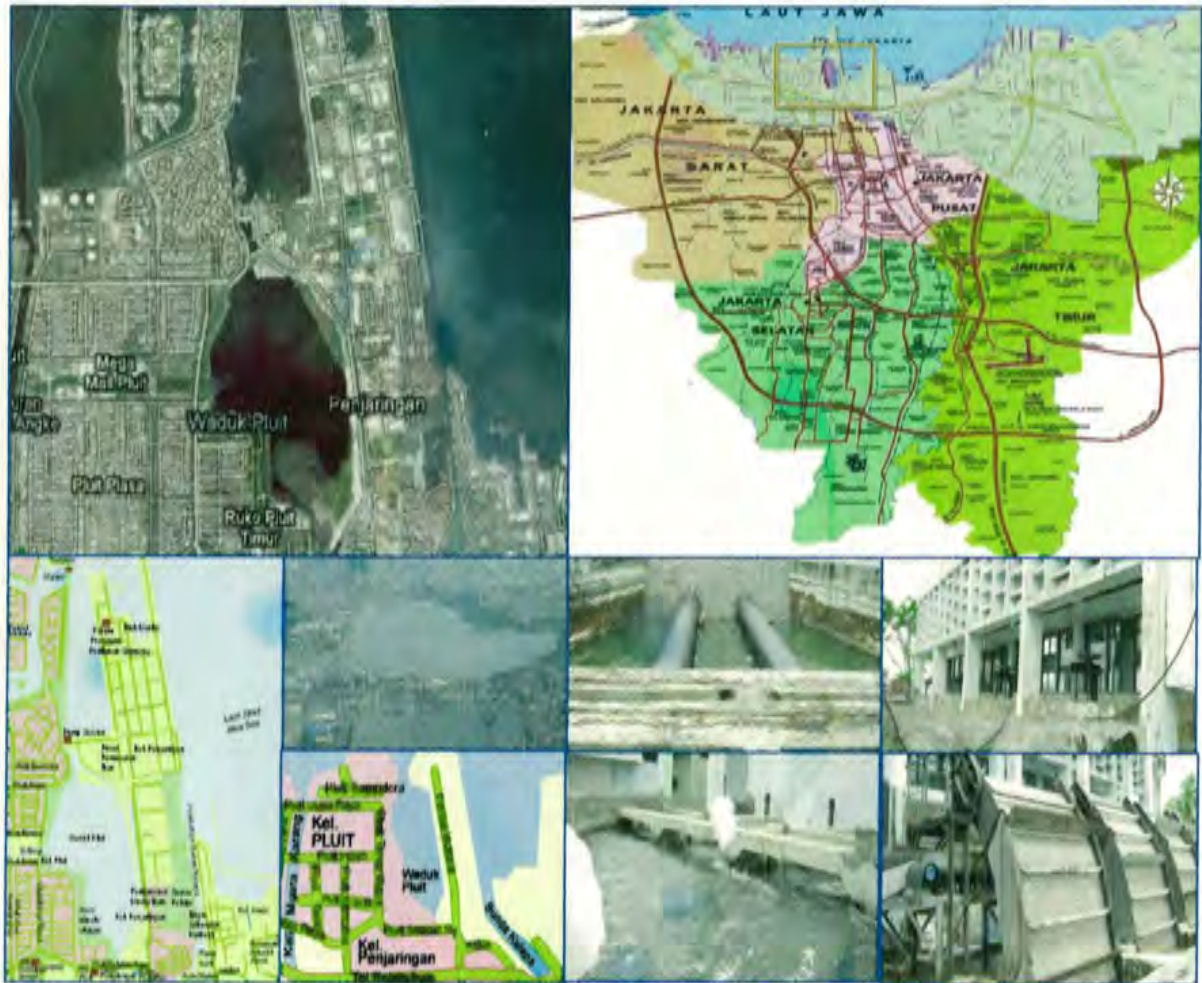
21	Global Warming (地球温暖化)	D	排水機場の改修によってポンプ性能が向上するなどの温暖化ガスの削減といった影響が想定され、温暖化への負の影響は想定されない。	D	排水機場の改修によってポンプ性能が向上するなどの温暖化ガスの削減といった影響が想定され、温暖化への負の影響はない。
22	Air Pollution (大気汚染)	D	排水機場の供用に伴う大気汚染の可能性は想定されない。	D	排水機場の供用に伴う大気汚染の可能性はない。
23	Water Pollution (水質汚濁)	D	排水機場の供用に伴う水質汚染の可能性は想定されない。	D	排水機場の供用に伴う水質汚染の可能性はない。
24	Soil Contamination (土壌汚染)	D	排水機場の供用に伴う土壌汚染の影響は想定されない。	D	排水機場の供用に伴う土壌汚染の影響はない。
25	Waste (廃棄物)	D	排水機場の供用に伴う廃棄物の発生は想定されない。	D	排水機場の供用に伴う廃棄物の発生はない。
26	Noise and Vibration (騒音・振動)	D	排水機場の供用に伴う騒音・振動の影響は想定されない。	D	排水機場の供用に伴う騒音・振動の影響はない。
27	Ground Subsidence (地盤沈下)	D	排水機場の供用に伴う地盤沈下の発生は想定されない。	D	排水機場の供用に伴う地盤沈下の発生はない。
28	Offensive Odor (悪臭)	D	排水機場の供用に伴う悪臭の発生の可能性は想定されない。	D	排水機場の供用に伴う悪臭の発生の可能性はない。
29	Bottom Sediment (沈殿物)	D	排水機場の供用に伴う沈殿物の発生の可能性は想定されない。	D	排水機場の供用に伴う沈殿物の発生の可能性はない。
30	Accidents (事故)	D	排水機場の供用に伴う事故の発生の可能性は想定されない。	D	排水機場の供用に伴う事故の発生の可能性はない。

表 6-5-2 主な環境社会影響・回避緩和策・モニタリング計画

項目	懸念されるマイナス面の影響	準備調査で想定した対応策		モニタリング方法	実施体制
		計画段階	施工中		
大気汚染	施工中の工事車両稼動に伴う大気汚染	<ul style="list-style-type: none"> ➤ 工事用車両による排気ガス発生を低減させるため、適切な工事計画及び稼動計画を立案する 	<ul style="list-style-type: none"> ➤ 工事用車両を含む施工機器の整備・点検を定期的に行う ➤ 適切な施工法を施工業者に徹底する 	<ul style="list-style-type: none"> ➤ 住民との協議／情報交換 ➤ 定期的に DINAS PU DKI Jakarta、施工業者、コンサルタントで協議・点検を行い、適宜指導・改善する 	<ul style="list-style-type: none"> ➤ DINAS PU DKI Jakarta ➤ 施工業者 ➤ コンサルタント
水質汚濁	護岸工事及び吐き出し水槽の埋め戻し工事による濁水	<ul style="list-style-type: none"> ➤ 濁水が流出しないよう、施工計画に適切な排水設備を含める 	<ul style="list-style-type: none"> ➤ 濁水が流出しないよう、適切な排水処理を施工業者に徹底させる 	<ul style="list-style-type: none"> ➤ 住民との協議／情報交換 ➤ 定期的に DINAS PU DKI Jakarta、施工業者、コンサルタントで協議・点検を行い、適宜指導・改善する 	<ul style="list-style-type: none"> ➤ DINAS PU DKI Jakarta ➤ 施工業者 ➤ コンサルタント
廃棄物	既存施設の撤去により発生する廃棄物		<ul style="list-style-type: none"> ➤ 撤去時に発生する廃棄物については、指定の場所に運搬・処分する ➤ 運搬中は周辺に飛散しないよう、施工業者に徹底させ、適切に運搬する 	<ul style="list-style-type: none"> ➤ 住民との協議／情報交換 ➤ 定期的に DINAS PU DKI Jakarta、施工業者、コンサルタントで協議・点検を行い、適宜指導・改善する 	<ul style="list-style-type: none"> ➤ DINAS PU DKI Jakarta ➤ 施工業者 ➤ コンサルタント
騒音・振動	施工中の工事車両稼動に伴う騒音・振動の発生	<ul style="list-style-type: none"> ➤ 非常用自家発電機は、防音型装置や振動緩和防振装置への設置等、騒音・振動緩和策を検討する ➤ 送配水ポンプ及び原水ポンプに係る騒音・振動は、室内設置や堅牢な基礎上への設置などによる騒音・振動緩和を検討する ➤ 施工に伴う騒音・振動について、騒音・振動緩和を考慮した適切な施工計画の立案を図る 	<ul style="list-style-type: none"> ➤ 周辺住民に対して工事計画を周知する適切な工事スケジュールを組む ➤ 工事用車両を含む施工機器の整備・点検を定期的に行う ➤ 適切な施工法を施工業者に徹底する ➤ 適切な交通整理を行う 	<ul style="list-style-type: none"> ➤ 住民との協議／情報交換 ➤ 定期的に DINAS PU DKI Jakarta、施工業者、コンサルタントで協議・点検を行い、適宜指導・改善する 	<ul style="list-style-type: none"> ➤ DINAS PU DKI Jakarta ➤ 施工業者 ➤ コンサルタント

交通事故	施工中の工事車両稼動による交通事故の発生	<ul style="list-style-type: none"> ➤ 工事用車両の運行ルートについて、交通事故を最小化するような最適ルートを検討する ➤ 交通量の多い時間帯を考慮した工事スケジュールを検討する 	<ul style="list-style-type: none"> ➤ 適切な工事スケジュールを組む ➤ 工事用車両を含む施工機器の整備・点検を定期的に行う ➤ 適切な施工法を施工業者に徹底する ➤ 適切な交通整理を行う 	<ul style="list-style-type: none"> ➤ 住民との協議／情報交換 ➤ 定期的に DINAS PU DKI Jakarta、施工業者、コンサルタントで協議・点検を行い、適宜指導・改善する 	<ul style="list-style-type: none"> ➤ DINAS PU DKI Jakarta ➤ 施工業者 ➤ コンサルタント
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UKL- UPL POMPA PLUIT



DINAS PEKERJAAN UMUM PROVINSI DKI JAKARTA
Jl. Taman Jati Baru No. 1 Jakarta Pusat Telp. (021) 3848510, Faks 3848510

2010

UPLにおける環境管理計画（英訳）

Table 6.1. Matrix of Environmental Management Efforts (UKL)

Impact Source	Kind of Impact	Parameter	Purpose/Aim	Environmental Management Efforts			Implementing Environmental Management		
				Management Method	Location	Period	Implementer	Supervisor	Reporting
Pre construction									
<ul style="list-style-type: none"> Socialization 	Public fretfulness	<ul style="list-style-type: none"> Number of complaint reports from surrounding communities Issue and perception non society 	To prevent the public fretfulness	<ul style="list-style-type: none"> Explain the plan of activity in carefully and taking care the norms on communities Always put forward the discussion and community sidedness with best solution 	Penjaringan District	Before construction activity	Initiator	<ul style="list-style-type: none"> Environment agency of North Jakarta Social Agency of North Jakarta 	<ul style="list-style-type: none"> Environment agency of North Jakarta Social Agency of North Jakarta
Construction									
<ul style="list-style-type: none"> Acceptance of Labor 	Employment and business opportunity	<ul style="list-style-type: none"> Numbers of workers from surrounding community Suitability of level income to minimum wage in city 	To have a role in creating job opportunity for surrounding communities	<ul style="list-style-type: none"> Giving priority to the surrounding residents to be construction worker as qualification needed Giving priority to the material supplier on surrounding location as qualification needed 	Penjaringan district	Prior construction activity	Contractor	<ul style="list-style-type: none"> Environment agency of North Jakarta Labor and transmigration agency of North Jakarta 	<ul style="list-style-type: none"> Environment agency of North Jakarta Labor and transmigration agency of North Jakarta
<ul style="list-style-type: none"> Mobilization of construction material and equipment 	Traffic disruption	<ul style="list-style-type: none"> Road jammed which passed by material construction vehicle 	To prevent the traffic jammed and disturbing due to increase of the traffic	<ul style="list-style-type: none"> Fix the damaged road as the impact of material transportation activity or heavy equipment The material transport vehicle must be completed with good tarpaulin for cover Arrange the schedule of material transport, not on rush hour 	Roads which is passed by material construction activity	Prior construction activity	Contractor	<ul style="list-style-type: none"> Environment Agency of North Jakarta Transportation Agency of North Jakarta 	<ul style="list-style-type: none"> Environment Agency of North Jakarta Transportation Agency of North Jakarta

Impact Source	Kind of Impact	Parameter	Purpose/Aim	Environmental Management Efforts			Implementing Environmental Management		
				Management Method	Location	Period	Implementer	Supervisor	Reporting
<ul style="list-style-type: none"> • Mobilization of construction equipment and material • Base camp construction • Construction of retaining building tide • Construction of pump house building • Construction of pump and electrical facilities • Demobilization of equipment 	Air quality degradation	CO, H2S, SO2, NO2 Dust and Pb based on Decree Letter of DKI Jakarta Governor No. 551/2001	To prevent the air quality degradation	<ul style="list-style-type: none"> • Bounding project area with covered fence made from iron (iron sheeting) • Using vehicle for material transportation in good condition • Watering the activity area in routine, especially the road which pass by construction/material vehicle • The transport vehicle must be completed with good tarpaulin for cover • Slowed down the speed of vehicle on the road near settlement 	Project place	prior construction activities	Constructor	- Environment Agency of North Jakarta	- Environment Agency of North Jakarta
<ul style="list-style-type: none"> • Mobilization of construction equipment and material • Base camp construction • Construction of retaining building tide • Construction of pump and electrical facilities • Demobilization of equipment 	Increasing of noise	Noise level based on decree letter of DKI Jakarta governor, No. 551/2001	To prevent and minimized the noise level on project location and surrounding, so it will not disturb the comfort and hearing the labor and surrounding communities	<ul style="list-style-type: none"> • Limitation the speed of vehicle • Construct the fence bounding project area • The vehicle must be in good condition 	Project place	Prior Construction activity	Contractor	•Environment Agency of North Jakarta	•Environment Agency of North Jakarta

Impact Source	Kind of Impact	Parameter	Purpose/Aim	Environmental Management Efforts			Implementing Environmental Management		
				Management Method	Location	Period	Implementer	Supervisor	Reporting
<ul style="list-style-type: none"> • Base camp construction • Construction of retaining building tide • Construction of pump and electrical facilities 	Increasing of waste	Whether there is a waste that accumulating and scattered on project area	To prevent the increase of waste which can caused the degradation of sea water quality	<ul style="list-style-type: none"> • Install the security net to prevent the falling of material to the reservoir and sea • Provide the temporary facility for waste • Use tarpaulin to cover the opened container of the material transportation vehicle, so the sand will not scattered on the road • Prepare the dumping site 	Project Are and around	Every day prior construction activity	Contractor	<ul style="list-style-type: none"> •Environment Agency of North Jakarta •Cleaning Agency of North Jakarta 	<ul style="list-style-type: none"> •Environment Agency of North Jakarta •Cleaning Agency of North Jakarta
<ul style="list-style-type: none"> • Construction of retaining building tide • Construction of pump house building • Construction of pump and electrical facilities 	Degradation of sea water quality	BOD, COD, TSS, pH, etc, based on Decree Letter of DKI Jakarta Governor No. 582, 1995	To prevent the degradation of sea water quality	<ul style="list-style-type: none"> • Provide the toilet facilities (public bathing and washing) for construction labor • Prevent the scattered of the material to the sea • Install the security net to prevent the falling material to the sea 	Project place	Prior construction activity	Contractor	<ul style="list-style-type: none"> •Environment Agency of North Jakarta •Public Works Agency of North Jakarta 	<ul style="list-style-type: none"> •Environment Agency of North Jakarta •Public Works Agency of North Jakarta
<ul style="list-style-type: none"> • Base camp construction • Construction of retaining building tide • Construction of pump and electrical facilities 	Working accident	Numbers of work accident	To avoid the accident and keep safety of the labor	<ul style="list-style-type: none"> • Giving advise to use the safety facilities such as project helmet 	Project place	Prior construction activity	Contractor	<ul style="list-style-type: none"> •Environment Agency of North Jakarta •Labor and Transmigration Agency of North Jakarta 	<ul style="list-style-type: none"> •Environment Agency of North Jakarta •Labor and Transmigration Agency of North Jakarta

Impact Source	Kind of Impact	Parameter	Purpose/Aim	Environmental Management Efforts			Implementing Environmental Management		
				Management Method	Location	Period	Implementer	Supervisor	Reporting
Operation									
<ul style="list-style-type: none"> • Operation of East Pluit Pump Station • Waste handling 	Air quality degradation	CO, H2S, SO2, NO2, and Pb, based on Decree Letter of DKI Jakarta Governor No. 551/2001	To prevent the degradation of air quality	<ul style="list-style-type: none"> • Make smokestack for electric generator • Maintain the pump and genset (backup electricity) equipment in periodically 	<ul style="list-style-type: none"> • Pump room • Genset Room 	Prior operation activity	Initiator and contractor	<ul style="list-style-type: none"> • Environment Agency of North Jakarta 	<ul style="list-style-type: none"> • Environment Agency of North Jakarta
<ul style="list-style-type: none"> • Operation of East Pluit Pump 	Sea water quality degradation	BOD, COD, TSS, pH, etc, based on Decree letter of DKI Jakarta Governor No. 582 year 1995	To prevent the degradation of sea water quality	<ul style="list-style-type: none"> • Install the screen on inlet and outlet of the water pipe • Clean the pump area and water drainage system in periodically • Control the water temperature of Genset's chiller before its throw away • Install the aerator to increase the level of soluble oxygen 	<ul style="list-style-type: none"> • Inlet and outlet of water drainage pipe • Area around East Pluit pump • Genset room 	Prior operation activity	Initiator and contractor	<ul style="list-style-type: none"> • Environment Agency of North Jakarta 	<ul style="list-style-type: none"> • Environment Agency of North Jakarta • Public works Agency of North Jakarta
<ul style="list-style-type: none"> • Operation of East Pluit pump station 	Increasing of waste	Weather there is waste that accumulating and scattered at East Pluit Pump station and around Bar screen pump	To prevent the degradation of the estetic and sea water quality caused by waste	<ul style="list-style-type: none"> • Provide temporary place for waste in the form of two containers • Daily cleaning on pump area and water drainage system • Transport the waste from temporary place to the final place of waste, regularly • Prohibit the waste burning activity • Transport the waste from surrounding Bar screen of east Pluit Pump, regularly 	<ul style="list-style-type: none"> • Waste accumulating area • Area around barscreen of east Pluit pump 	Prior operation activity	Initiator and contractor	<ul style="list-style-type: none"> • Environment Agency of North Jakarta • Cleaning Agency of North Jakarta 	<ul style="list-style-type: none"> • Environment Agency of North Jakarta • Cleaning Agency of North Jakarta

Impact Source	Kind of Impact	Parameter	Purpose/Aim	Environmental Management Efforts			Implementing Environmental Management		
				Management Method	Location	Period	Implementer	Supervisor	Reporting
<ul style="list-style-type: none"> • Operation of east Pluit pump station • Pump station maintenance • Electricity use 	Increasing of oil and lubricant waste	Whether there is oil and used lubricant	To prevent the pollution of sea water quality	<ul style="list-style-type: none"> • Retain the residue oil of genset and pump machine on the covered drum, then put it in the special area/room for oil before giving to institution/third party which have license to transport and manage it furthermore • The channel on the genset completed with oiltrap 	<ul style="list-style-type: none"> • Genset room and East Pluit pump room 	Prior operation activity	Initiator and contractor	<ul style="list-style-type: none"> • Environment Agency of North Jakarta 	<ul style="list-style-type: none"> • Environment Agency of North Jakarta
<ul style="list-style-type: none"> • Operation of east Pluit pump station • East Pluit pump maintenance 	Working accident	Number of working accident	To avoid the working accident and keeping labor safe	<ul style="list-style-type: none"> • Give advice to use safety facilities such as project helmet • Prohibit the person who has no importance to enter the working area 	<ul style="list-style-type: none"> • East Pluit pump station 	Prior operation activity	Initiator and contractor	<ul style="list-style-type: none"> • Environment Agency of North Jakarta • Labor and transmigration Agency of North Jakarta 	<ul style="list-style-type: none"> • Environment Agency of North Jakarta • Labor and transmigration Agency of North Jakarta
<ul style="list-style-type: none"> • Waste handling 	Public health	Number of disease incidence	To avoid the waste accumulating that can caused disease	<ul style="list-style-type: none"> • Give advice for cleaning maintenance • Transport the waste from temporary place to the final place of waste • Prohibit the waste burning activity • Transport the waste from surrounding area of Bar screen of East Pluit pum, regularly 	<ul style="list-style-type: none"> • Waste accumulating place • Around bar screen of East Pluit pump 	Prior operation activity	Initiator and contractor	<ul style="list-style-type: none"> • Environment Agency of North Jakarta • Cleaning Agency of North Jakarta 	<ul style="list-style-type: none"> • Environment Agency of North Jakarta • Cleaning Agency of North Jakarta

UPLにおける環境モニタリング計画（英訳）

Table 6.2. Matrix of Environmental Monitoring Efforts (UPL)

Impact Source	Kind of Impact	Parameter	Environmental Monitoring Efforts			Implementing Environmental Monitoring		
			Method	Location	Monitoring Period	Implementer	Supervisor	Reporting
PRE CONSTRUCTION								
<ul style="list-style-type: none"> Socialization 	Public Fretfulness	<ul style="list-style-type: none"> Number of Complaint reports from surrounding communities Issue and perception on society 	<ul style="list-style-type: none"> Interview with residents, village party, and community leader Report to the central information and to village party and district 	Penjaringan District	Prior construction activity	Initiator	<ul style="list-style-type: none"> Environment Agency of North Jakarta Social Agency of North Jakarta 	<ul style="list-style-type: none"> Environment Agency of North Jakarta Social Agency of North Jakarta
CONSTRUCTION								
<ul style="list-style-type: none"> Acceptance of labor 	Employment and business opportunity	<ul style="list-style-type: none"> number of workers from the surrounding community suitability of lever income with minimum wage 	<ul style="list-style-type: none"> Interview with residents, village party, and community leader Population age data and clarify the age of the population around that still productive 	Penjaringan District	Once in 6 months during construction activities	Initiator	<ul style="list-style-type: none"> Environment Agency of North Jakarta Labor Agency and Transmigration of North Jakarta 	<ul style="list-style-type: none"> Environment Agency of North Jakarta Social Agency and Transmigration of North Jakarta
<ul style="list-style-type: none"> Mobilization of construction equipment and material Demobilization of equipment 	Traffic disruption	Road jammed which is passed by material construction vehicle	<ul style="list-style-type: none"> Direct observation (LHR survey and community per- seption) 	Road which is passed by material construction vehicle	Once in 6 months during construction activities	Initiator	<ul style="list-style-type: none"> Environment Agency of North Jakarta Transportation Agency of North Jakarta 	<ul style="list-style-type: none"> Environment Agency of North Jakarta Transportation Agency of North Jakarta

Impact Source	Kind of Impact	Parameter	Environmental Monitoring Efforts			Implementing Environmental Monitoring		
			Method	Location	Monitoring Period	Implementer	Supervisor	Reporting
<ul style="list-style-type: none"> • Mobilization of construction equipment and material • Base camp construction • Construction of retaining building tide • Construction of pump house building • Construction of pump and electrical facilities • Demobilization of equipment 	Air quality degradation	CO, H2S, SO2, NO2 Dust and Pb based on Decree Letter of DKI Jakarta Governoor No. 551/2001	- Sampling - Laboratory analysis	Project place	Once in 6 months during construction activities	Initiator	- Environment Agency of North Jakarta	- Environment Agency of North Jakarta
<ul style="list-style-type: none"> • Mobilization of construction equipment and material • Base camp construction • Construction of retaining building tide • Construction of pump house building • Construction of pump and electrical facilities • Demobilization of equipment 	Increasing of noise	Noise level based on Decree Letter of DKI Jakarta Governoor No. 551/2001	Measurement with sound level meter	Project place	Once in 6 months during construction activities	Initiator	- Environment Agency of North Jakarta	- Environment Agency of North Jakarta

Impact Source	Kind of Impact	Parameter	Environmental Monitoring Efforts			Implementing Environmental Monitoring		
			Method	Location	Monitoring Period	Implementer	Supervisor	Reporting
<ul style="list-style-type: none"> • Base camp construction • Construction of retaining building tide • Construction of pump and electrical facilities 	Increasing of waste	Whether there is a waste that is accumulating and scattered on project place	<ul style="list-style-type: none"> - Self Monitoring - Direct visual observation 	Project place and around	Every 6 months during construction activities	Initiator	<ul style="list-style-type: none"> - Environment Agency of North Jakarta - Cleaning Agency of North Jakarta 	<ul style="list-style-type: none"> - Environment Agency of North Jakarta - Cleaning Agency of North Jakarta
<ul style="list-style-type: none"> • Construction of retaining building tide • Construction of pump house building • Construction of pump and electrical facilities 	Sea water quality degradation	BOD, COD, TSS, pH etc based on Decree Letter of DKI Jakarta Governor No. 582, 1995	<ul style="list-style-type: none"> - Sampling - Laboratory analysis 	Project place	<ul style="list-style-type: none"> Once in 3 months samping Every 6 month during construction activities 	Initiator	<ul style="list-style-type: none"> - Environment Agency of North Jakarta - Public Work Agency of North Jakarta 	<ul style="list-style-type: none"> - Environment Agency of North Jakarta - Public Work Agency of North Jakarta
<ul style="list-style-type: none"> • Base camp construction • Construction of retaining building tide • Construction of pump house building • Construction of pump and electrical facilities 	Working accident	Numbers of work accident	<ul style="list-style-type: none"> - Interview with labor construction - Examination of accident data from construction contractor 	Project place	Once in 6 months during construction activities	Initiator	<ul style="list-style-type: none"> - Environment Agency of North Jakarta - Labor Agency and Transmigration of North Jakarta 	<ul style="list-style-type: none"> - Environment Agency of North Jakarta - Labor Agency and Transmigration of North Jakarta

Impact Source	Kind of Impact	Parameter	Environmental Monitoring Efforts			Implementing Environmental Monitoring		
			Method	Location	Monitoring Period	Implementer	Supervisor	Reporting
OPERATION								
<ul style="list-style-type: none"> • Operation of East Pluit pump station • Waste handling 	Air quality degradation	CO, H2S, SO2, NO2, and Pb based on Decree Letter of DKI Jakarta Governoor No. 551/2001	<ul style="list-style-type: none"> - Sampling - Laboratory analysis 	- pump room and genset room of East Pluit pump	Once in 6 months during the operation	Initiator	- Environment Agency of North Jakarta	- Environment Agency of North Jakarta
<ul style="list-style-type: none"> • Operation of East Pluit pump station 	Sea water quality degradation	BOD, COD, TSS, ph, etc based on Decree Letter of DKI Jakarta Governoor No. 582 Year 1995	<ul style="list-style-type: none"> - Sampling once in 3 months - Laboratory Analysis once in 3 months 	<ol style="list-style-type: none"> 1. Inner and outer of water pipe 2. Area around East Pluit Pump 	Once in 6 months during the operation	Initiator	<ul style="list-style-type: none"> - Environment Agency of North Jakarta - Public Work Agency of North Jakarta 	<ul style="list-style-type: none"> - Environment Agency of North Jakarta - Public Work Agency of North Jakarta
<ul style="list-style-type: none"> • Operation of East Pluit pump station 	Increasing of waste	Whether there is a waste that is accumulating and scattered at East Pluit Pump station and around barscreen pump.	<ul style="list-style-type: none"> - Self Monitoring - Direct visual observation 	<ul style="list-style-type: none"> - Waste Accumulating Area - Area around barscreen of East Pluit pump. 	Once in 6 months during the operation	Initiator	<ul style="list-style-type: none"> - Environment Agency of North Jakarta - Cleaning Agency of North Jakarta 	<ul style="list-style-type: none"> - Environment Agency of North Jakarta - Cleaning Agency of North Jakarta
<ul style="list-style-type: none"> • Operation of East Pluit pump station • Pump Station Maintenance • Electricity Use 	Increasing of waste oil and lubricant	Whether there is oil and used lubricant	<ul style="list-style-type: none"> - Direct visualization - Waste concrete shipping manifest examination 	- Genset room and East Pluit pump room	Once in 6 months during the operation	Initiator	- Environment Agency of North Jakarta	- Environment Agency of North Jakarta
<ul style="list-style-type: none"> • Operation of East Pluit pump station • Pump Station Maintenance at East Pluit 	Working accident	Number of working accident	<ul style="list-style-type: none"> - Interview with labor about operation or during construction - Examination of accident data from construction contractor 	East Pluit pump station	Once in 6 months during the operation	Initiator	<ul style="list-style-type: none"> - Environment Agency of North Jakarta - Labor Agency and Transmigration of North Jakarta 	<ul style="list-style-type: none"> - Environment Agency of North Jakarta - Labor Agency and Transmigration of North Jakarta
<ul style="list-style-type: none"> • Waste handling • Operation of East Pluit pump station 	Public Health	Disease incidence	List of patient and type of diseases at health center in at health center in	<ul style="list-style-type: none"> - Health Centre in Penjaringan district - Area around East Pluit pump 	Once in 6 months during the operation	Initiator	<ul style="list-style-type: none"> - Environment Agency of North Jakarta - Health Agency of North Jakarta 	<ul style="list-style-type: none"> - Environment Agency of North Jakarta - Health Agency of North Jakarta



PEMERINTAH PROVINSI DAERAH KHUSUS IBUKOTA JAKARTA
KANTOR LINGKUNGAN HIDUP (KLH)
KOTA ADMINISTRASI JAKARTA UTARA

JL. Laksda. Yos Sudarso No. 27-29 Blok P Lt. 8 Telepon/Fax : (021) 4358794

Nomor : 025/1.774.151
Sifat : Penting
Lampiran : 1 (satu) berkas
Hal : Rekomendasi Dokumen Upaya
Pengelolaan Lingkungan dan
Upaya Pemantauan Lingkungan
Pompa Pluit

16 April 2010

Kepada
Yth. Kepala Dinas Pekerjaan Umum
Jalan Taman Jatibaru No. 1

di

Jakarta

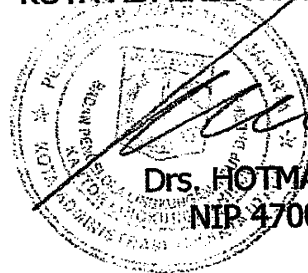
Sehubungan dengan surat Saudara tertanggal 30 Maret 2010 Nomor 2147/-1.774.151 perihal Surat Pengantar Permohonan Jadwal Sidang UKL/UPL Pompa Pluit serta hasil pembahasan Dokumen UKL-UPL yang telah dilaksanakan pada tanggal 8 April 2010, dapat disampaikan hal-hal sebagai berikut:

1. Bahwa sesuai Keputusan Menteri Negara Lingkungan Hidup Nomor 86 Tahun 2002 tentang Pedoman Pelaksanaan Upaya Pengelolaan Lingkungan dan Upaya Pemantauan Lingkungan dan Keputusan Gubernur Propinsi DKI Jakarta Nomor 189 Tahun 2002 tentang Jenis Usaha/Kegiatan yang wajib dilengkapi dengan Upaya Pengelolaan Lingkungan (UKL) dan Upaya pemantauan Lingkungan (UPL) di Propinsi DKI Jakarta, sebagaimana dinyatakan didalam dokumen dimaksud merupakan persyaratan bagi penerbitan perizinan Daerah, yang wajib disusun dan dilaksanakan sesuai ketentuan yang berlaku;
2. Bahwa rencana usaha atau kegiatan sebagaimana dipaparkan didalam dokumen UKL dan UPL tergolong kegiatan yang tidak berdampak penting dan atau secara teknologi sudah dapat dikelola dampak pentingnya;
3. Sebagaimana Berita Acara dan notulen hasil pembahasan Tim Penilaian Dokumen UKL- UPL Walikota Jakarta Utara Nomor 024/UKL-UPL/IV/2010 pada hari Kamis tanggal 8 April 2010 tentang penilaian dokumen Upaya Pengelolaan Lingkungan (UKL) dan Upaya Pemantauan Lingkungan (UKL) Perbaikan Pompa Pluit Sisi Timur cq. Dinas Pekerjaan Umum Provinsi DKI Jakarta lokasi kegiatan beralamat di Jalan Pluit Selatan Kelurahan Penjaringan Kecamatan Penjaringan Kota Administrasi Jakarta Utara maka dokumen UKL/UPL dapat disetujui;

4. Bahwa pemrakarsa usaha atau kegiatan terikat untuk melaksanakan seluruh materi kegiatan pengelolaan dan pemantauan lingkungan sebagaimana ketentuan peraturan perundangan yang berlaku, apabila dikemudian hari ternyata ditemukan kondisi atau hal-hal yang tidak sesuai dengan materi dokumen UKL- UPL dimaksud maka hasil penilaian dokumen UKL- UPL ini gugur dengan sendirinya, dan kepada pemrakarsa kegiatan dapat dikenakan sanksi sesuai dengan ketentuan hukum dan peraturan perundang-undangan yang berlaku;
5. Bahwa pemrakarsa usaha atau kegiatan wajib menyampaikan laporan implementasi UKL – UPL sesuai dengan jadwal pemantauan yang dinyatakan didalam dokumen UKL – UPL (setiap 6 bulan) kepada Badan Pengelola Lingkungan Hidup Daerah Provinsi Daerah Khusus Ibukota Jakarta cq. Kantor Lingkungan Hidup Jakarta Utara, instansi pemberi izin dan instansi pembina lainnya.

Demikian, atas perhatian dan kerjasamanya diucapkan terima kasih.

KEPALA KANTOR LINGKUNGAN HIDUP
KOTA ADMINISTRASI JAKARTA UTARA



Drs. HOTMAN SILAEN
NIP. 470032457

UKL/UPL 承認レターの翻訳

No : 025/1.774.151 April, 16 2010
Classified : Important
Appendix : 1 (one) file
Subject : Document To
Recomendation UKL/ Head of Dinas Pekerjaan Umum
UPL Pluit Pump Taman Jatibaru Street No. 1
in Jakarta

According to your letter dated March 30, 2010 No. 2147/-1.774.151 about request for meeting schedule of UKL/ UPL Pump Pluit and the results of the meeting that held on April 8, 2010, can be informed as follow :

1. According to Keputusan Menteri Negara Lingkungan Hidup No. 86 Year 2002 about Guidelines for the Implementation of Upaya Pengelolaan Lingkungan (UKL) & Upaya pemantauan Lingkungan (UPL) and Keputusan Gubernur Province DKI Jakarta No. 189 Year 2002 about Type of Activities shall be furnished with UKL/ UPL Document in Province DKI Jakarta. This UKL/ UPL Document is required to get Region Permit in accordance with applicable Regulation.
2. Activity Plan as described in the UKL/ UPL Document is classified as activity that does not have essential impact on environment and/ or the essential impact can be managed technically.
3. As the minutes of meeting of the Assessment Team UKL/ UPL Document Mayor of North Jakarta No. 024/UKL-UPL/IV/2010 on Thursday, April 8, 2010 about assessment of the UKL/ UPL Document of East Pluit Pump Reconstruction att. Dinas Pekerjaan Umum Province DKI Jakarta, project site located in Kelurahan Penjaringan Kecamatan Penjaringan, North Jakarta City Administration, the UKL/ UPL Document is approved.

4. Project proponent shall comply with UKL/ UPL Document, if in the implementation stage there are some conditions that do not comply with the UKL/ UPL Document, the assessment result of UKL/ UPL Document is aborted, and the project proponent can be punished in accordance with applicable Regulations and Legislation.

5. Project proponent shall report the implementation of the UKL/ UPL Document based on the monitoring schedule as stated in the UKL/ UPL Document (in every six months) to the Badan Pengelola Lingkungan Hidup Daerah Province DKI Jakarta (BPLHD DKI Jakarta) att. Kantor Lingkungan Hidup Jakarta Utara (KLH Jakarta Utara).

Thank you for your attention and cooperation.

Sign

(Head of Kantor Lingkungan
Hidup North Jakarta City
Administration)

資料－ 7 想定被害額の概算結果

資料—7 想定被害額の概算結果

1. 東排水機場機能損失に付随する想定被害規模の検討

1-1 検討方針

プルイット東排水機場のパイピングにより内水区域への海水進入防御、内水区域の内水排除能力が同時に失われた。東排水場の機能が停止することにより、2008年2月洪水と同等の洪水が発生した場合、貯水池の水位は実績最高水位(2008年2月：-0.36mPP)より1m以上上昇することとなる。さらに、パイピングによる海水の進入及び高潮等を考慮すれば、ほぼ海水面まで内水区域の浸水位は上昇すると想定される。

想定浸水エリアは東排水機場が停止することによって上昇する水位以下及び、パイピングによる海水の浸入を想定した、朔望平均満潮位以下のエリアとして検討を行った。

想定被害額について、「ジャボデタベック地域緊急洪水被害調査,2002（以下、「既往調査」と称す）」でまとめられている被害想定の方法に、物価上昇による補正を加えて実施した。

(1)既往調査における被害算定方法

既往調査における2002年の想定被害額は、浸水被害のあった31地区を以下に示すA、B、Cの3地域に分類し、3地域の単位ヘクタール（ha）当たりの平均想定被害額（表-1）に各自治体の浸水面積を乗じることによって算定されている。

また、被害額は、「建設コストを中程度に見積もった場合」で算定されている。

- A. 都市部の人口密度150人/ha以上の浸水地区
- B. 都市部の人口密度150人/ha未満の浸水地区
- C. 地方部の浸水地区

既往調査の想定被害額

- ・ 想定被害額＝浸水面積（ha）×単位面積当たりの平均想定被害額（百万ルピア/ha）

表—1 都市部と地方部の単位ha当たりの平均想定被害額（単位：百万ルピア/ha）

場所	建設コスト：中程度
A. 都市部（人口密集地）（150人/ha以上）	794.2
B. 都市部（人口密集地）（150人/ha以下）	543.6
C. 地方部	34.0

出典：「ジャボデタベック地域緊急洪水被害調査,2002」

注）2002年評価額

(2)物価上昇に伴う補正

物価上昇に伴う補正率は、ジャカルタ特別州地区の域内国内総生産 GRDP (Gross Regional Domestic Product) の 2003 年から 2008 年の 5 年間における上昇率から設定する。

・物価上昇に伴う補正率=2008 年 GRDP/2003 年 GRDP =677411.1/334331.3=2.026

表-3 ジャカルタ特別州における域内国内総生産

年	ジャカルタ特別州域内国内総生産 (十億ルピア)	2003 年比
2003	334,331.3	1.000
2004	375,561.5	1.123
2005	433,860.3	1.298
2006	501,771.7	1.501
2007*	566,449.4	1.694
2008*	677,411.1	2.026

出典：Statistical Yearbook of Indonesia by Bandon Pusat Statistik

*：速報値

(3)被害算定方法

被害額の算定は、既往調査でまとめられている被害額に、物価上昇による補正を加えて実施する。

なお、単位 ha 当たりの想定被害額は、プルート近傍のプンジャリンガン地区の値（表-2）を使用した。

・想定被害額=浸水面積 (ha) ×プンジャリンガン地区の単位面積当たりの
想定被害額 (百万ルピア/ha) ×物価上昇による補正

1.2 想定浸水区域

(1) 東排水機場停止による内水浸水区域

東排水機上停止により想定される浸水区域は、図-1 に示すとおりであり、各地区浸水面積は表-4 に示すとおりである。

表-4 各地区の内水想定浸水面積(ha)

地域	浸水面積 (ha)
北ジャカルタ	889.3
西ジャカルタ	230.1
中央ジャカルタ	0.2
合計	1,119.6

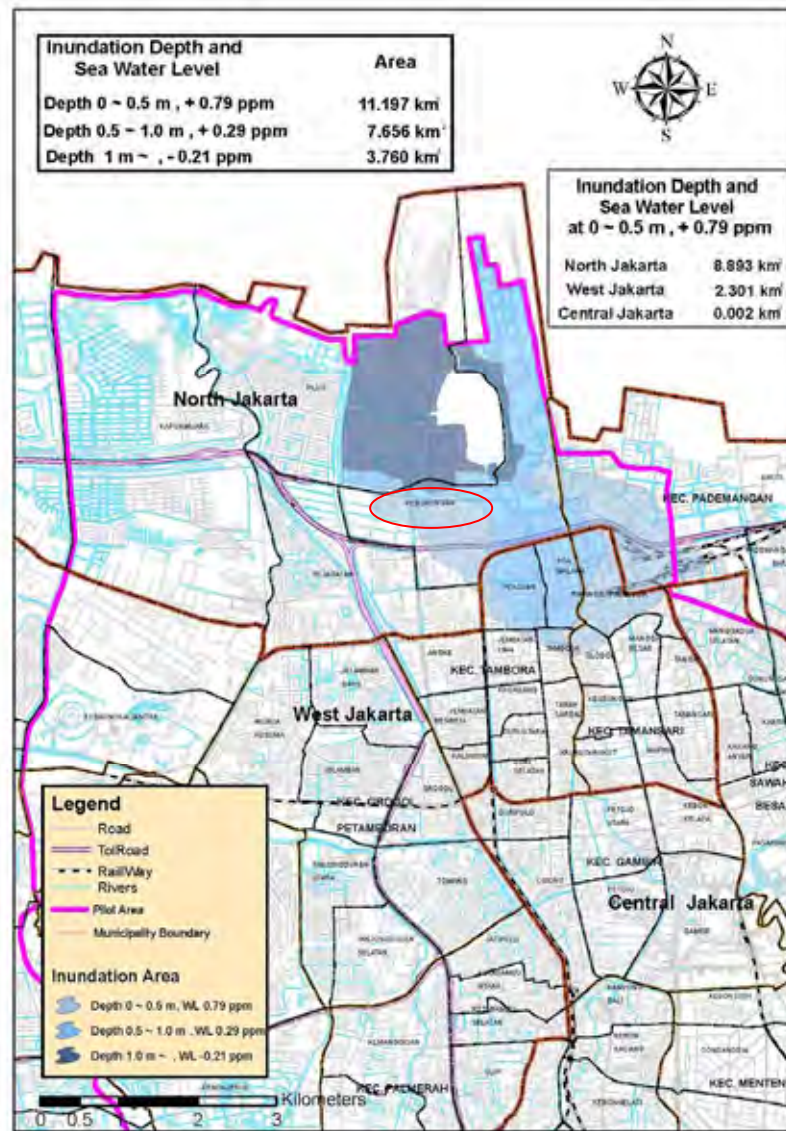


図-1 内水時の浸水面積

(2) 朔望平均満潮位

朔望平均満潮位に想定される浸水区域は、図-2 に示すとおりであり、各地区浸水面積は表-5 に示すとおりである。

表-5 各地区の高潮潮位時の想定浸水面積(ha)

地域	浸水面積 (ha)
北ジャカルタ	1,100.6
西ジャカルタ	411.5
中央ジャカルタ	29.9
合計	1,542.0

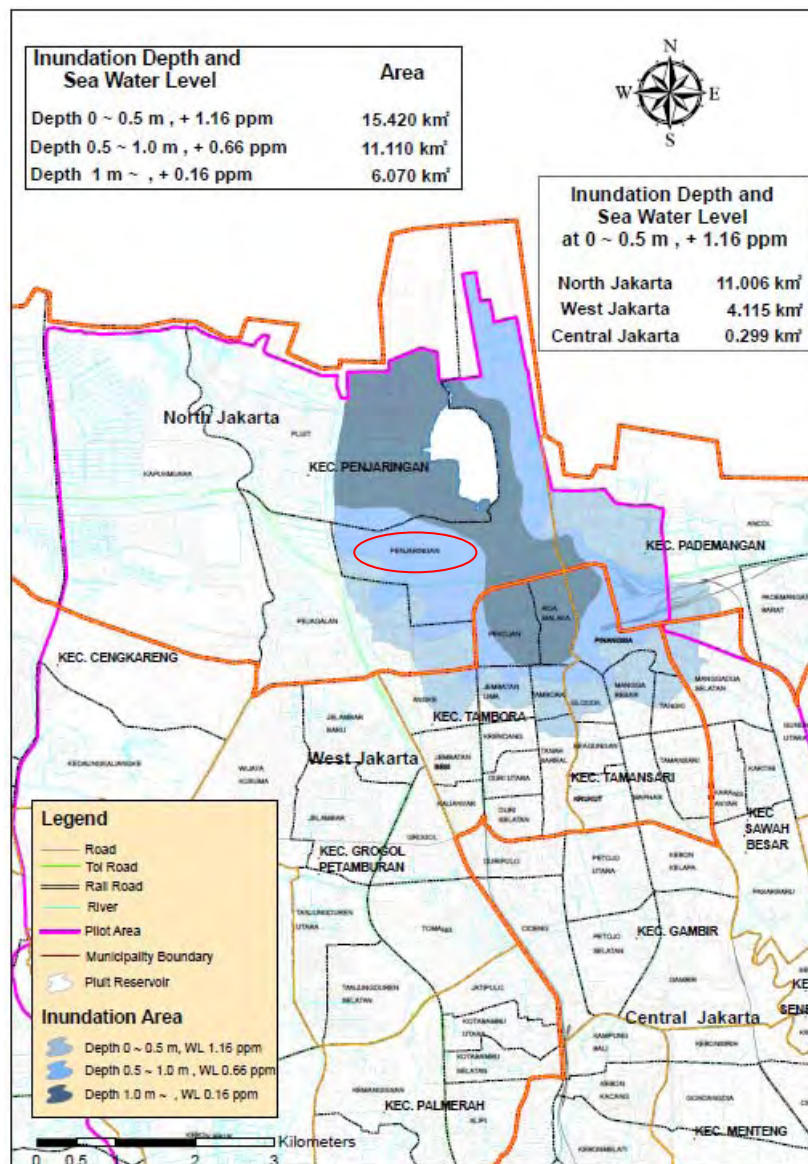


図-2 高潮時の浸水面積

1.3 想定被害額

想定被害額は、被害を受ける施設の復旧のために必要となる建設コストを中程度に見積もった場合を対象とし、各自治体の浸水面積に各地域の単位 ha 当たりの想定被害額と物価上昇による補正率を乗じて算定した。

想定被害額の算定結果は、表-6～7に示すとおりである。

表-6 内水氾濫時の想定被害額

地域	浸水面積(ha)	平均被害額 (百万ルピア/ha)	物価補正率	想定被害額 (億ルピア)	想定被害額 (億円)
北ジャカルタ	899.3	543.60	2.026	9,794.16	93.28
西ジャカルタ	230.1	794.20	2.026	3,702.42	35.26
中央ジャカルタ	0.2	794.20	2.026	3.22	0.03
合計	1,119.6			13,499.80	128.57

表-7 高潮潮位時の想定被害額

地域	浸水面積(ha)	平均被害額 (百万ルピア/ha)	物価補正率	想定被害額 (億ルピア)	想定被害額 (億円)
北ジャカルタ	1,100.6	543.60	2.026	12,121.28	115.44
西ジャカルタ	411.5	794.20	2.026	6,621.24	63.06
中央ジャカルタ	29.9	794.20	2.026	481.11	4.58
合計	1,542.0			19,223.63	183.08

資料－8 地質調查結果

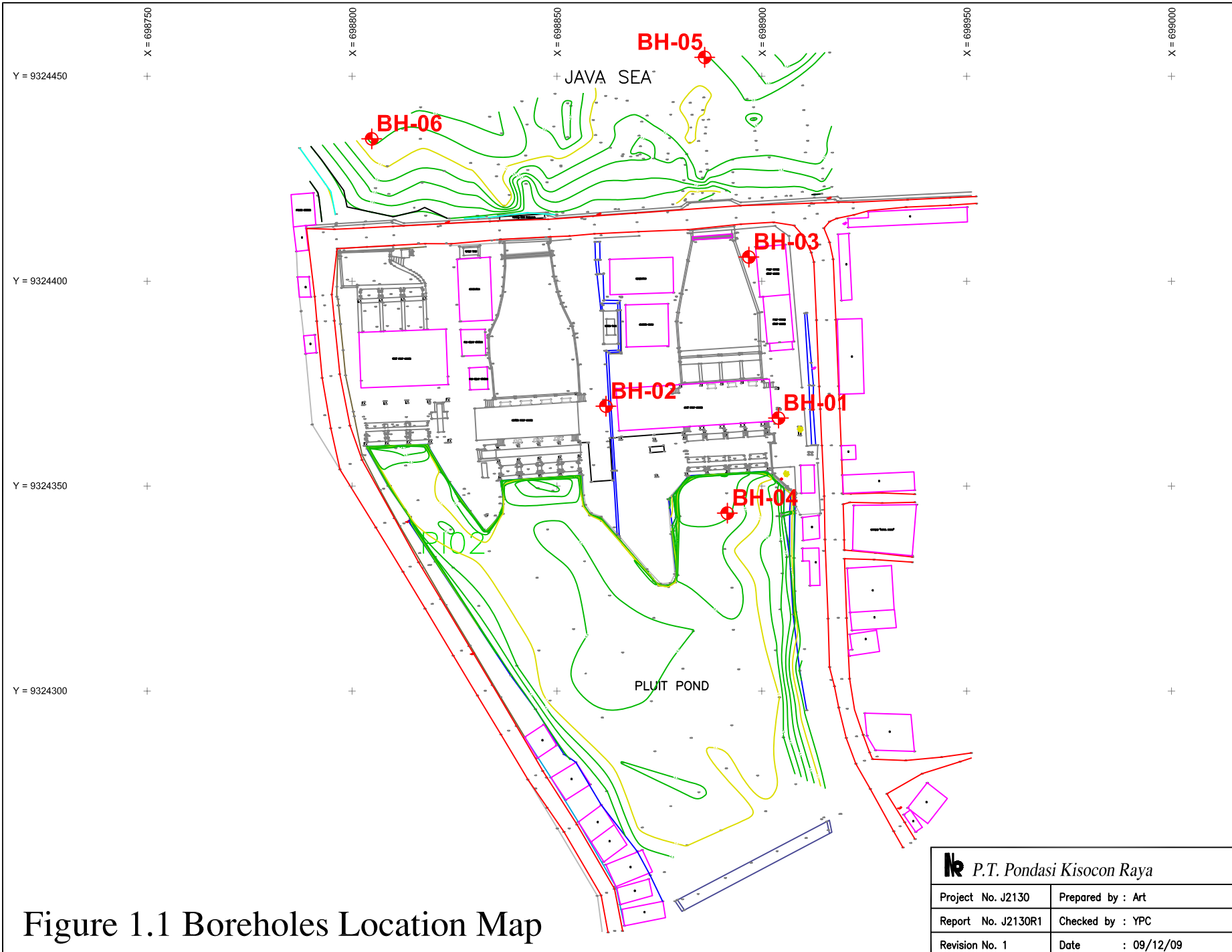


Figure 1.1 Boreholes Location Map


 P.T. Pondasi Kisocon Raya	
Project No. J2130	Prepared by : Art
Report No. J2130R1	Checked by : YPC
Revision No. 1	Date : 09/12/09

TABLE 2.2(a) SUMMARY OF LABORATORY SOIL TEST

Project : Geotechnical Investigation For Pluit Pump House

Standard: ASTM

Borehole No.		BH-01	BH-01	BH-01	BH-01	BH-01	BH-01	BH-01	BH-01	BH-02
Sample No.		UDS-2	UDS-3	P-13	P-15	UDS-4	P-26	P-40	P-47	UDS-1
Sample Depth (m)	From To	8.50 9.20	13.50 14.00	20.50 20.87	23.50 23.95	29.00 29.50	40.50 40.90	60.50 60.95	68.50 68.95	2.50 3.00
Condition of Sample		UD	UD	D	D	UD	D	D	D	UD
Natural water content (ω_n), %		103	75	78	38	82	37	31	28	45
Specific Gravity (G_s)		2.580	2.550	2.740	2.710	2.680	2.640	2.850	2.690	2.680
Wet density (γ_t), kN/m ³		14.1	15.1	-	-	15.0	-	-	-	17.2
Dry density (γ_d), kN/m ³		6.9	8.6	-	-	8.2	-	-	-	11.9
Natural void ratio (e_o)		2.64	1.89	-	-	2.19	-	-	-	1.21
Degree of saturation (S_r), %		100	100	-	-	100	-	-	-	99
Atterberg Limit	Liquid Limit (LL), %	100	77	-	NP	89	-	NP	44	74
	Plastic Limit (PL), %	35	32	-	NP	34	-	NP	28	31
	Plasticity Index (PI), %	65	45	-	NP	55	-	NP	16	43
Grain Size Distribution	Gravel, %	6	0	0	2	0	0	0	0	4
	Sand, %	12	1	10	72	1	13	58	18	16
	Silt, %	33	75	69	16	81	81	33	59	38
	Clay, %	49	24	21	10	18	6	9	23	42
	Max. diameter, mm	4.75	0.25	2.00	4.75	0.43	2.00	2.00	2.00	12.70
	Diam. at 60%, mm	0.011	0.034	0.027	0.345	0.015	0.026	0.158	0.037	0.017
	Diam. at 10%, mm	-	-	-	0.004	-	0.013	0.007	-	-
Visual soil description		Silty Clay	Clayey Silt	Clayey Silt	Silty Sand	Clayey Silt	Sandy Silt	Silty Sand	Clayey Silt	Silty Clay
ASTM Soil Classification		CH	CH	-	SM	CH	-	SM	ML	CH
Unconfined Compression Test	Undisturbed Strength (q_u), kN/m ²	-	-	-	-	-	-	-	-	-
	Remoulded Strength (q_r), kN/m ²	-	-	-	-	-	-	-	-	-
	Sensitivity Ratio	-	-	-	-	-	-	-	-	-
	Strain at failure (ϵ), %	-	-	-	-	-	-	-	-	-
Triaxial Compression Test	Friction Angle (ϕ), degree	24	19	-	-	18	-	-	-	24
	Cohesion Intercept (c), kPa	34	38	-	-	54	-	-	-	24
	Drainage condition	CU	CU	-	-	UU	-	-	-	CU
Consolidation Test	Preconsolidation Press. (p'_c), kPa	50	196	-	-	461	-	-	-	157
	Compression Index, C_c	1.42	0.92	-	-	2.48	-	-	-	0.42
	Coef. of Consol., c_v , m ² /year	6	6	-	-	5	-	-	-	7
Chemical Test	pH value	-	-	-	-	-	-	-	-	-
	Total sulphate content, %	-	-	-	-	-	-	-	-	-
	Chloride content, %	-	-	-	-	-	-	-	-	-
Remark :	NP: Non Plastic									

G:\Proj\J2130_Pluit_S\SSST (G)\[SST-2009 Corrected with piston friction.xls]Table

TABLE 2.2(b) SUMMARY OF LABORATORY SOIL TEST

Project : Geotechnical Investigation For Pluit Pump House

Standard: ASTM

Borehole No.		BH-02	BH-02	BH-02	BH-02	BH-02	BH-03	BH-03	BH-03	BH-03
Sample No.		UDP-2	P-11	P-16	UDS-2	P-27	UDS-1	P-13	P-15	UDS-3
Sample Depth (m)	From	9.00	20.50	26.00	33.50	42.00	2.50	21.50	24.50	30.50
	To	9.90	20.95	26.45	34.00	42.42	3.00	21.79	24.89	31.00
Condition of Sample		UD	D	D	UD	D	UD	D	D	UD
Natural water content (ω_n), %		93	57	50	46	38	47	46	33	21
Specific Gravity (G_s)		2.490	2.770	2.740	2.710	2.770	2.480	2.690	2.770	2.710
Wet density (γ_t), kN/m ³		14.0	-	-	15.9	-	15.9	-	-	17.3
Dry density (γ_d), kN/m ³		7.2	-	-	10.9	-	10.8	-	-	14.3
Natural void ratio (e_o)		2.37	-	-	1.44	-	1.25	-	-	0.85
Degree of saturation (S_r), %		98	-	-	87	-	94	-	-	66
Atterberg Limit	Liquid Limit (LL), %	113	22	41	73	-	58	44	NP	53
	Plastic Limit (PL), %	43	17	26	31	-	31	28	NP	30
	Plasticity Index (PI), %	70	5	15	42	-	27	16	NP	23
Grain Size Distribution	Gravel, %	4	0	8	0	2	1	1	1	0
	Sand, %	12	23	21	1	25	36	40	75	1
	Silt, %	34	65	58	63	68	31	48	17	71
	Clay, %	50	12	13	36	5	32	11	7	28
	Max. diameter, mm	9.53	2.00	12.70	0.25	9.53	4.75	4.75	4.75	0.43
	Diam. at 60%, mm	0.008	0.037	0.054	0.028	0.051	0.054	0.083	0.272	0.022
	Diam. at 10%, mm	-	0.003	0.003	-	0.025	-	0.004	0.012	-
Visual soil description		Silty Clay	Sandy Silt	Sandy Silt	Clayey Silt	Sandy Silt	Clayey Sand	Sandy Silt	Silty Sand	Clayey Silt
ASTM Soil Classification		CH	CL	ML	CH	-	MH	ML	SM	MH
Unconfined Compression Test	Undisturbed Strength (q_u), kN/m ²	-	-	-	-	-	-	-	-	-
	Remoulded Strength (q_r), kN/m ²	-	-	-	-	-	-	-	-	-
	Sensitivity Ratio	-	-	-	-	-	-	-	-	-
	Strain at failure (ϵ), %	-	-	-	-	-	-	-	-	-
Triaxial Compression Test	Friction Angle (ϕ), degree	0	-	-	17	-	40	-	-	13
	Cohesion Intercept (c), kPa	17	-	-	29	-	4	-	-	38
	Drainage condition	UU	-	-	UU	-	CU	-	-	UU
Consolidation Test	Preconsolidation Press. (p'_c), kPa	49	-	-	294	-	72	-	-	304
	Compression Index, C_c	1.10	-	-	0.43	-	0.42	-	-	0.29
	Coef. of Consol., c_v , m ² /year	8	-	-	5	-	8	-	-	9
Chemical Test	pH value	-	-	-	-	-	-	-	-	-
	Total sulphate content, %	-	-	-	-	-	-	-	-	-
	Chloride content, %	-	-	-	-	-	-	-	-	-
Remark :	NP: Non Plastic									

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TABLE 2.2(c) SUMMARY OF LABORATORY SOIL TEST

Project : Geotechnical Investigation For Pluit Pump House

Standard: ASTM

Borehole No.		BH-03	BH-03	BH-04	BH-04	BH-04	BH-04	BH-04	BH-05	BH-05
Sample No.		P-28	UDS-4	UDP-1	P-10	P-12	UDS-1	P-33	UDP-1	P-11
Sample Depth (m)	From	45.00	47.50	4.00	16.50	19.00	30.50	45.50	6.50	19.00
	To	45.36	48.00	4.90	16.95	19.40	31.00	45.95	7.40	19.39
Condition of Sample		D	UD	UD	D	D	UD	D	UD	D
Natural water content (ω_n), %		22	72	119	37	32	37	36	114	61
Specific Gravity (G_s)		2.660	2.470	2.550	2.770	2.680	2.680	2.580	2.600	2.620
Wet density (γ_t), kN/m ³		-	15.0	13.6	-	-	17.8	-	14.0	-
Dry density (γ_d), kN/m ³		-	8.7	6.2	-	-	13.0	-	6.5	-
Natural void ratio (e_o)		-	1.78	3.02	-	-	1.02	-	2.89	-
Degree of saturation (S_r), %		-	100	100	-	-	97	-	100	-
Atterberg Limit	Liquid Limit (LL), %	45	84	94	NP	NP	96	NP	88	45
	Plastic Limit (PL), %	32	34	34	NP	NP	36	NP	35	30
	Plasticity Index (PI), %	13	50	60	NP	NP	60	NP	53	15
Grain Size Distribution	Gravel, %	1	0	1	0	0	0	1	0	2
	Sand, %	47	1	5	75	70	1	75	1	15
	Silt, %	38	86	45	16	21	66	12	44	63
	Clay, %	14	13	49	9	9	33	12	55	20
	Max. diameter, mm	4.75	0.43	4.75	4.75	2.00	0.43	4.75	0.25	9.53
	Diam. at 60%, mm	0.556	0.016	0.008	0.280	0.217	0.023	0.339	0.007	0.051
	Diam. at 10%, mm	-	0.003	-	0.005	0.006	-	0.003	-	-
Visual soil description		Silty Sand	Clayey Silt	Silty Clay	Silty Sand	Silty Sand	Clayey Silt	Silty Sand	Silty Clay	Clayey Silt
ASTM Soil Classification		ML	CH	CH	SM	SM	CH	SM	CH	ML
Unconfined Compression Test	Undisturbed Strength (q_u), kN/m ²	-	-	-	-	-	-	-	-	-
	Remoulded Strength (q_r), kN/m ²	-	-	-	-	-	-	-	-	-
	Sensitivity Ratio	-	-	-	-	-	-	-	-	-
	Strain at failure (ϵ), %	-	-	-	-	-	-	-	-	-
Triaxial Compression Test	Friction Angle (ϕ), degree	-	-	25	-	-	0	-	0	-
	Cohesion Intercept (c), kPa	-	-	10	-	-	114	-	17	-
	Drainage condition	-	-	CU	-	-	UU	-	UU	-
Consolidation Test	Preconsolidation Press. (p'_c), kPa	-	500	39	-	-	284	-	39	-
	Compression Index, C_c	-	1.29	1.45	-	-	0.40	-	1.28	-
	Coef. of Consol., c_v , m ² /year	-	10	5	-	-	10	-	6	-
Chemical Test	pH value	-	-	-	-	-	-	-	-	-
	Total sulphate content, %	-	-	-	-	-	-	-	-	-
	Chloride content, %	-	-	-	-	-	-	-	-	-
Remark :	NP: Non Plastic									

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TABLE 2.2(d) SUMMARY OF LABORATORY SOIL TEST

Project : Geotechnical Investigation For Pluit Pump House

Standard: ASTM

Borehole No.		BH-05	BH-05	BH-05	BH-06	BH-06	BH-06	BH-06	BH-06	BH-06
Sample No.		P-16	UDS-3	P-23	UDP-1	UDS-1	P-12	UDS-2	P-33	P-38
Sample Depth (m)	From	24.50	30.00	35.50	4.00	13.50	19.00	26.50	44.50	50.00
	To	24.95	30.40	35.95	4.90	14.00	19.35	27.00	44.95	50.45
Condition of Sample		D	UD	D	UD	UD	D	UD	D	D
Natural water content (ω_n), %		31	48	40	92	63	29	69	16	36
Specific Gravity (G_s)		2.720	2.590	2.620	2.630	2.500	2.660	2.690	2.720	2.590
Wet density (γ_t), kN/m ³		-	17.3	-	15.0	15.8	-	14.9	-	-
Dry density (γ_d), kN/m ³		-	11.7	-	7.8	9.7	-	8.8	-	-
Natural void ratio (e_o)		-	1.17	-	2.30	1.53	-	1.99	-	-
Degree of saturation (S_r), %		-	100	-	100	100	-	93	-	-
Atterberg Limit	Liquid Limit (LL), %	NP	75	47	82	75	NP	105	NP	32
	Plastic Limit (PL), %	NP	30	28	30	30	NP	40	NP	24
	Plasticity Index (PI), %	NP	45	19	52	45	NP	65	NP	8
Grain Size Distribution	Gravel, %	0	0	0	0	0	1	0	1	0
	Sand, %	78	1	17	1	1	79	11	74	3
	Silt, %	10	84	66	40	58	12	70	17	88
	Clay, %	12	15	17	59	41	8	19	8	9
	Max. diameter, mm	2.00	0.43	2.00	0.43	0.25	4.75	2.00	4.75	2.00
	Diam. at 60%, mm	0.357	0.024	0.036	0.005	0.018	0.334	0.018	0.611	0.028
	Diam. at 10%, mm	0.003	-	-	-	-	0.006	-	0.009	0.008
Visual soil description		Silty Sand	Clayey Silt	Clayey Silt	Silty Clay	Clayey Silt	Silty Sand	Clayey Silt	Silty Sand	Clayey Silt
ASTM Soil Classification		SC	CH	ML	CH	CH	SM	CH	SM	ML
Unconfined Compression Test	Undisturbed Strength (q_u), kN/m ²	-	-	-	-	-	-	-	-	-
	Remoulded Strength (q_r), kN/m ²	-	-	-	-	-	-	-	-	-
	Sensitivity Ratio	-	-	-	-	-	-	-	-	-
	Strain at failure (ϵ), %	-	-	-	-	-	-	-	-	-
Triaxial Compression Test	Friction Angle (ϕ), degree	-	16	-	0	19	-	15	-	-
	Cohesion Intercept (c), kPa	-	90	-	14	6	-	37	-	-
	Drainage condition	-	UU	-	UU	UU	-	UU	-	-
Consolidation Test	Preconsolidation Press. (p'_c), kPa	-	540	-	22	167	-	598	-	-
	Compression Index, C_c	-	0.37	-	1.08	0.40	-	1.48	-	-
	Coef. of Consol., c_v , m ² /year	-	9	-	15	16	-	6	-	-
Chemical Test	pH value	-	-	-	-	-	-	-	-	-
	Total sulphate content, %	-	-	-	-	-	-	-	-	-
	Chloride content, %	-	-	-	-	-	-	-	-	-
Remark :	NP: Non Plastic									

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