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PROJECT COMPLETION REPORT

INDONESIA

JAKARTA SEWERAGE AND SANITATION PROJECT

(LOAN 2236-IND)

JUNE 30, 1993

MICROGRAPHICS

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**Infrastructure Operations Division
Country Department III
East Asia and Pacific Regional Office**

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CURRENCY EQUIVALENTS

(As of March, 1992)

Currency Unit = Indonesian Rupiah (Rp)

US\$1 = Rp 2,000

Rp 1 million = US\$500

FISCAL YEAR

Government of Indonesia: April 1 - March 31

Local Governments: April 1 - March 31

PRINCIPAL ABBREVIATIONS AND ACRONYMS USED

ADB	-	Asian Development Bank
BPAL	-	Interim Entity
CK	-	Directorate General of Human Settlements
DKI-Jakarta	-	Jakarta Special Capital Province
GOI	-	Government of Indonesia
ICB	-	International Competitive Bidding
ISU	-	Interim Sewerage Unit
JSSP	-	Jakarta Sewerage and Sanitation Project
JUDP	-	Jabotabek Urban Development Project
KIP	-	Kampung Improvement Project
MA	-	Memorandum of Agreement
MCK	-	Public Facility
MPW	-	Ministry of Public Works
O&M	-	Operation and Maintenance
PDAM	-	Water company
PDPAL	-	Sewerage Entity
PIU	-	Project Implementation Unit
PLP	-	Directorate of Sanitary Engineering
PMU	-	Project Management Unit
UNDP	-	United Nation's Development Program

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Office of Director-General
Operations Evaluation

MEMORANDUM TO THE EXECUTIVE DIRECTORS AND THE PRESIDENT

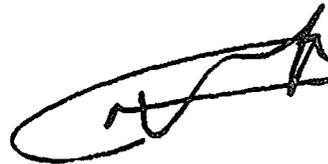
SUBJECT: Project Completion Report on Indonesia
Jakarta Sewerage and Sanitation Project (Loan 2236-IND)

Attached is the "Project Completion Report on Indonesia - Jakarta Sewerage and Sanitation Project (Loan 2236-IND)," prepared by the East Asia and Pacific Regional Office with Part II contributed by the borrower.

The project resulted from an alternative design approach to the prohibitively expensive master plan proposals for the sewerage of Jakarta. It proposed a mixed sewerage and low cost waste disposal solution, appropriate to specific areas, and the testing of these alternatives in a small pilot project.

The physical, environmental and public health objectives of the project were not achieved due to inappropriate design, poor implementation and procurement problems. An autonomous sewerage entity has been established but it is short of staff, has weak management and is financially insecure. Accordingly the outcome of the project is rated as unsatisfactory and the sustainability of its limited achievements as unlikely. The achievement of the institutional development objectives was partial.

The Project Completion Report is of mediocre quality but the lack of technical and financial information is due to the paucity of project data. The better prepared Part II emphasizes the inadequate preparation of the project. An audit of the project is planned.



PROJECT COMPLETION REPORTINDONESIAJAKARTA SEWERAGE AND SANITATION PROJECT
(Loan No. 2236-IND)Table of Contents

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PROJECT COMPLETION REPORT

INDONESIA

JAKARTA SEWERAGE AND SANITATION PROJECT

Preface

This document presents a Project Completion Report (PCR) for the Jakarta Sewerage and Sanitation Project (JSSP). Basic descriptive data for the project includes:

Loan No.	2236-IND
Loan Amount	US\$22,400,000
Board Approval Date	February 8, 1983
Loan Completion Date	March 31, 1991
Completion Delay	60%
Percentage of Loan Disbursed	98%
Final Disbursement Date	August 14, 1991

The PCR was prepared by the Infrastructure Division of Department 3 (EA3IN), East Asia and Pacific Region, and the Borrower represented by the Directorate General of Human Settlements commonly known as Cipta Karya, of the Ministry of Public Works. The Borrower has reviewed Part I and III of this PCR and its comments have been incorporated.

Preparation of this PCR was discussed with GOI representatives during the supervision mission of March 1991, and a brief visit to the Project Management in October 1991. GOI staff and Project Management with the help of consultants initiated preparation of the Borrower's Evaluation (Part II) during the second half of 1991, and submitted their report in January 1992.

This report is based, inter alia, on the Staff Appraisal Report, Loan Agreement, supervision reports, consultant outputs, correspondence between the Bank and the Borrower, and the internal Bank memoranda.

PROJECT COMPLETION REPORT

INDONESIA

JAKARTA SEWERAGE AND SANITATION PROJECT

Evaluation Summary

The operation reviewed in this PCR was the first step in recognizing the lack of attention in the past to sewerage and sanitation in Indonesia in general and in Jakarta in particular, and the obvious need for developing what was called nonconventional but appropriate solutions in a relatively new urban sector. The prime objective of the project was the improvement and safeguarding of public health by improving the urban environment (para. 1.8). The long-term objective of the project was the establishment of appropriate institutions to become responsible for sewerage and sanitation services.

Implementation experience has been disappointing (para. 1.12). Serious problems, ranging from tardy procurement procedures, shortage of counterpart funds, weak implementation organization, to institutional issues emerged early in the start-up phase and persisted throughout the implementation period. As a result the Bank and the Borrower came to the realization that a practical way to complete the project was to reduce its scope by deferring several components which were assessed as requiring more time and making them candidates for inclusion in the next generation of Jakarta Urban Projects. Subsequently the Bank and GOI agreed to reformulate the project to allow completion of certain schemes whose implementation was relatively advanced. Several of the schemes postponed were later incorporated as components of the Jabotabek Urban Development Projects (JUDP) II and III which were approved by the Board in 1990.

The results of the operation were mixed, and in general fell short of both physical targets and main objectives (para. 1.18). The institutional objective of establishing a financially autonomous sewerage entity in Jakarta within acceptable regulatory framework has been achieved substantially. An entity of DKI Jakarta now exists charged with the responsibility and requisite authority for managing sewerage services in Jakarta. PDPAL Jaya, the newly established sewerage entity, will be responsible for future operations and maintenance of the sewerage system. The financing for operations and maintenance of the sewerage system will be provided from the user charges PDPAL Jaya will levy on all its customers. The sewerage tariff rate and structure has been designed to provide full cost recovery in the medium to long term (para. 1.19). Under JUDP II Loan, the Borrower made an undertaking for achievement of a cash break-even point for the sewerage operation. This condition has already been met and PDPAL is expected to self-finance its operating budget fully effective April 1992. But it remains a weak organization which continues to rely on technical assistance currently being provided under the JUDP-II project.

A small sewerage system has been completed connecting many of Jakarta's high-rise and commercial buildings in the main business area along the Jalan Sudirman/Rasuna Said road axis. The remaining sewerage schemes representing about 48% of the total sewerage treatment capacity will be completed under the on-going JUDP II Project. A maximum of about 175,000 population equivalent will be served by the sewerage system after it is built to currently available treatment capacity (paras. 2.2-2.5).

The results of the sanitation program were not encouraging, as the program was beset with a combination of obstacles which significantly reduced the potential for this program as a viable option for disposal of human waste in Jakarta in an environmentally safe way. Various surveys conducted during the implementation proved that leaching pits and septic tanks were already in use in most areas where population densities were moderate or low and the sanitation conditions were generally adequate. However, the same surveys also found out that leaching pits were unsuitable in the target areas characterized as kampungs with acute sanitation needs typically located where population densities are high. Key obstacles which rendered much of the target area unsuitable included shallow groundwater level, low soil permeability, high flooding frequency, dependence on an unsuitable credit program for applicant households and non-availability of space for the environmentally safe twin-pit system of leaching pits (paras. 2.20-2.26). The efforts made in this component in involving the community through their organizations and through the participation of local non-governmental organizations were very successful in community interest in the program but helped little to change the results of the program.

Surveys carried out on the drainage program indicated that most of the drainage problems in the project area, and by extension in Jakarta as a whole are man-made. They were generally built undersize, and their functioning is often hampered by encroachment from real estate developers. There is a lack of effective enforcement of drainage regulations. The problems of drains, however, are limited in the tertiary system which accounts for 85% of the total length. More serious problems are found in the secondary and primary drains. The drains are generally hydraulically deficient and many require maintenance and cleaning. Meaningful improvement will require land acquisition in already developed areas which will inevitably involve the time consuming and sensitive problems of resettlement and compensation. In any case, future programs to improve drainage in Jakarta will have to focus on the drains with catchment areas greater than a hectare (paras. 2.30-2.32).

The findings and lessons learned from this operation are numerous all pointing to the fact that the challenges facing the provision of environmentally safe human waste disposal systems in Jakarta are enormous. The various approaches which were being tested under this project faced severe limitations leaving the project with little or no impact for the most part.

Sewerage which was new to Jakarta proved to be generally acceptable to the target group in the project area (para. 1.40). Further work will be needed to establish to what extent its coverage can be extended. On-site sanitation program proved to be impractical where soil conditions were unsuitable, and population densities were high. The community sanitation

facilities (MCK's) had low level of acceptability at the community. In addition due to lack of space, they could not be built where sanitation needs were most acute (para. 1.41). The drainage problems in Jakarta are largely manmade, mostly having been built undersize and often rendered ineffective by encroachment. Appropriate regulations and their enforcement will be needed to bring about improvements in the drainage systems.

The pilot nature of this operation in a city as large as Jakarta calls for caution in the way the conclusions are to be interpreted. In Particular the lessons learned should be treated as tentative in providing generalised solutions particularly for the on-site sanitation issues. Further work would be necessary to confirm or prove otherwise any of the major lessons learned in this operation.

PROJECT COMPLETION REPORT

INDONESIA

JAKARTA SEWERAGE AND SANITATION PROJECT

I. PROJECT REVIEW FROM BANK'S PERSPECTIVE

1. Project Identity

Project Name:	Jakarta Sewerage and Sanitation Project
Loan No.:	2236-IND
RVP Unit:	Asia
Country:	Indonesia
Sector:	Urban
Subsector:	Sewerage/Sanitation
Project City:	Jakarta
Loan Amount:	US\$22.4 million
Disbursed:	US\$21.95 million
Canceled:	US\$.45 million

2. Project Background

1.1 As measured by standard indices health conditions in Indonesia lay behind those in other countries at a similar stage of economic development. At the end of the 1970s, life expectancy in Indonesia was 54 years, compared with the average for other low- and middle-income countries of 59 and 61 years respectively. The average infant mortality rate was estimated at about 101 per 1,000 births compared to about 49 in the Philippines and Thailand, and 29 in Malaysia. Infant mortality as high as 200 per 1,000 births have been reported in some areas. Endemic diseases, caused principally by a lack of safe drinking water and adequate sewerage and sanitation were major factors behind these statistics. Diarrheal diseases are a principal cause of morbidity and infant mortality.

1.2 It was estimated that 40% of the urban population had access to some form of reticulated water supply in 1981. Most of the water supply suffered from contamination, low pressure and intermittent supply. A considerable portion of the urban population does not have access to public water supply, and is dependent on water from vendors, wells, streams or rivers at considerable health risks. Only about 20% of the urban population has satisfactory sanitation facilities. Jakarta, the national capital and the most popular city in Indonesia, had a population of about 6.5 million and growing at an annual rate approaching 4.5%. Only 50% of Jakarta's population had direct access to reticulated water provided by Pam Jaya, a semi-autonomous public water supply utility of DKI-Jakarta. The remainder of the population, mostly low income groups, buy water from vendors, often at a cost in excess of

10% of household income, or obtain it from polluted rivers, springs or private wells.

1.3 In 1972, Government of Indonesia (GOI) made a decision to prepare a master plan for sewerage disposal in Jakarta which was to take into account the entire relationships between sewerage, water supply, drainage and solid waste disposal. A UNDP funded study was carried out by Nihon Suido of Japan which completed the master plan in 1977.

1.4 The master plan recommended a phased construction of a conventional water borne sewerage system, discharging untreated sewage into the Java sea. The total cost was estimated at US\$500 million (1976 prices), which was later considered understated. The first phase to serve about 900,000 people in the Setia Budi and Gambir areas in Jakarta was estimated at US\$100 million. The plan was considered extraordinarily costly and apparently lacked justification for the construction of a water-borne sewerage system and was eventually not implemented.

1.5 In 1979, GOI and the Bank agreed to a different approach which would include lower cost solutions in those areas where such options appeared feasible. It was agreed that the approach would be a combination of sewerage, drainage and sanitation works including on-site facilities with emphasis on low-cost measures. In addition, initially a small pilot project testing these options would be undertaken to gain experience which would later be replicated elsewhere in Jakarta. GOI selected the Setia Budi area for the pilot project and the consulting firm of Alpinconsult of Switzerland was selected to carry out feasibility and engineering studies to prepare the project. The consultants, financed from a Technical Assistance Loan (898-IND) and Urban III Loan (Loan No. 1653-IND), completed preparation of the project in June 1982 and the Bank appraised the project later in the same year.

3. Project Objectives and Description

Project Objectives

1.6 During the formulation of Bank-financed KIP projects in Jakarta which preceded this project, it was recognized that the provision of the basic infrastructure in the most needy areas, which these projects were to serve, would provide a first and minimum level of improvement in environmental conditions. It was envisaged that a second level of improvement providing better standards in water supply, waste disposal and sanitation would follow. Thus the objectives of this project were clearly defined by the desire to meet the public health safety and environmental improvement of a higher level of services through a combination of conventional as well as nonconventional sanitation options, providing better standards than those of preceding operations under the KIP.

1.7 The main project strategies focussed on including the existing and projected concentration of large commercial and industrial properties in the project area for sewerage so as to increase the level of cost recovery of the sewerage system and the direct involvement of the affected communities in the selections of on-site facilities both for individual as well as communal use.

As sewerage was going to be a new service, the need to make appropriate institutional arrangements for future operation and maintenance, and for financial administration and accounting was well considered at the conceptual phase.

1.8 The principal objectives of the project were therefore defined as follows:

- (a) improve the environmental and public health conditions in the project area to serve an estimated population of about 4,000,000;
- (b) establish appropriate institutional arrangements for the operation and maintenance, and eventual augmentation of the sewerage system;
- (c) demonstrate the practical feasibility of low-cost and appropriate technologies for improved sanitation; and
- (d) contribute to the improvement of the technical operations and management of Jakarta's water supply system.

1.9 The broader objective of the project lay in its catalytic role as a pilot whereby its successful experimentation in sewage disposal and sanitation would be replicated in Jakarta.

Project Description

1.10 There was no water-borne sewerage system in Jakarta as early initiatives on sanitation improvements included in the GOI Kampung Improvement Program (KIP), consisted of public facilities (mCKs) which provide washing facilities, toilets, public water taps, private septic tanks, leaching pits, and solid waste disposal projects. At the time, sewerage projects were only being initiated on a pilot scale in Bandung and Medan with assistance from the Asian Development Bank (ADB).

1.11 The sewerage and sanitation project for Jakarta included the construction of a sewerage system, drainage works, sanitation components, training and consultants services covering engineering, institutional, technical and financial aspects.

- (a) The Sewerage System. The sewerage system development included interceptors of about 7 km and related secondary and tertiary sewers of about 50 km covering the area believed to include most existing and projected commercial and industrial sites with large offices and high rise buildings, mostly along major roads in and around the Setia Budi ponds. The development also included construction of primary sewers of about 12 km in Manggarai, and conversion of the Setia Budi and Melati flood control ponds into combined sewerage treatment and flood control ponds.
- (b) Drainage System Improvement was intended to cover macro-drainage works of about 4 km of canal and riverbeds, and the construction of a new culvert under the Manggarai rail yard to relieve the flood

prone area of Tebet from monsoon flows from the Kali Bata (Bata river). The component was also intended to include micro-drainage improvements covering about 177 km of drains, and the construction of 24 km of new drains.

(c) The Sanitation Component. This component was intended to include:

- (i) construction of about 3,000 leaching pits in predominantly low income areas with population densities higher than the average for Jakarta;
- (ii) provision of desludging facilities and sludge transportation equipment, construction of sludge thickening station, acquisition and preparation of sludge disposal area;
- (iii) the construction of about 30 new public washing and toilet facilities, i.e., MCK's, together with connections to water supply and provision for sewerage and other liquid waste disposal; and
- (iv) the rehabilitation and provision of about 100 public water taps, including the laying of about 12 km of pipes to connect existing and new water taps to a water source.

(d) Studies for Institution Development and Design and Supervision of Works

- (i) Institutional development studies for the sewerage system, including the establishment of technical, (O&M administrative) and financial management systems and procedures, cost recovery mechanism, appropriate sewerage entity and drafting of appropriate regulations governing the use of the sewerage system;
- (ii) studies of the administrative structure and procedures, and technical and financial operations of PAM Jaya and other agencies which may operate the sewerage system;
- (iii) preparation of future water supply, sewerage and sanitation projects; and
- (iv) studies of matters relating to Jakarta's water supply system, including, but not limited to the supply of raw water, its transmission, treatment, and distribution, bulk and individual metering, and the extent of illegal connections and detection of water losses, and the preparation of feasibility studies for future projects.

4. Project Design and Implementation Organization

Project Design

1.12 The basic concept in designing this project was to promote comprehensive environmental improvements in one area of Jakarta through investments in sewerage and sanitation. Emphasis was placed on the importance of taking an integrated approach to reflect adequately the close interrelationships among water supply, sewerage, sanitation, drainage, flood control and solid waste management. But the Bank perceived from the outset that the extent to which sanitation could be included in the project was limited by a variety of reasons: (a) apparent lack of conviction by the department of sanitary engineering (PLP) in Cipta Karya in the workability of the sanitation program; (b) inadequate work of consultants who did not get adequate guidance from CK; and (c) as was encountered in the KIP projects, nonavailability of space/land in the Kampung, to include additional public water kiosks and public and private toilets (MCKs and leaching pits).

1.13 The sewerage system - conventional water-borne interceptors and related secondary and tertiary sewers, was selected in order to serve a maximum number of customer connections with a minimum development of the reticulation network. All effluents from the project area which flow into the Banjir Canal which is a source of raw water intake to one of Pam Jaya's water treatment plants at the time would be discharged to the two Setia Budi Ponds. The ponds which were serving a flood control function would be equipped with electrically operated aerators so that they could serve a dual function by operating as sewerage treatment facilities as well. The effluents from the ponds would be diverted to the Kali (river) Cideng, which discharges into the Jakarta bay. The size of the sewerage system in the area was therefore limited by the capacity of the treatment ponds determined to be 395 lps. The project was designed as an interim sewerage solution for Jakarta and a pilot to permit testing a number of human waste disposal theories and using the experience to be gained for replication to other parts of Jakarta as well as other cities in Indonesia.

Implementation and Organization

1.14 Implementation of the project commenced soon after the Loan became effective on June 17, 1983, four months from the date of signing. However, before long, unforeseen difficulties which hampered implementation emerged quite rapidly, (para. 1.30) and after considerable delays the Bank became seriously concerned about the progress. It soon became clear to the Bank and GOI that the project implementation could not be returned to the original schedule under the conditions prevailing then due largely to a serious deterioration in physical progress and that as many months had passed without noticeable progress, considerable reformulation of the project was necessary in order to achieve at least some of the principal project objectives. By August 1985, 26 months out of the scheduled 45 months of implementation period had passed, but overall physical progress had achieved no more than 7% compared with 50% appraisal estimate. A revised scheme consisting of three phases of the project was devised by the GOI/CK as an attempt to overcome the

implementation obstacles and lead to an attractive package of (a) an operational sewerage and sanitation system, (b) a viable, competent, operating sewerage authority; and (c) a plan for future expansion. With the new implementation proposal in mind, the GOI requested a three year extension of the loan closing date to permit the completion of the revised scheme from the Bank. The Bank granted a three year extension after a satisfactory review of the Borrower's plan of actions, and the project's loan closing was thus extended from March 31, 1988 to March 31, 1991 in annual increments.

1.15 To understand the difficulties that plagued the progress of the project, it is imperative to examine how project responsibilities were organized or shared between the key project implementing agencies - namely DKI Jakarta, and D.G. Cipta Karya of the Ministry of Public Works.

1.16 In accordance with GOI's declared policy for decentralization of central government responsibilities, both the Bank and GOI agreed that the project's implementation responsibilities would be shared between Cipta Karya and the DKI Jakarta provincial government in a manner which was prescribed in a Memorandum of Agreement (MA) executed by both agencies, specifying their respective responsibilities (para. 1.30). The MA called for CK to delegate responsibilities to DKI while primarily remaining responsible for coordination, overall control of the project, and reporting progress. In response to this policy, CK set up a Project Management Unit (PMU) headed by a project manager whose appointment was designed to be a joint decision of both CK and DKI. In practice, however, evidence is scarce to suggest any process depicting a joint effort between DKI Jakarta and CK as the PMU head was responsible only to the latter. The day-to-day implementation activities were assigned to a Project Implementation Unit (PIU) in the Public Works Department (DPU) of DKI headed by a project director who was also head of the DKI's sanitation division. The PMU was supported by staff seconded from CK's directorate of sanitary engineering (PLP), who reported to the PMU project manager, and by foreign and local consultants for detailed design, construction supervision, preparation of tender documents, bid evaluation, and reporting and monitoring, also reporting to PLP. Several staff from DKI's KIP Unit which was perceived to have had considerable experience in the implementation of previous Bank-assisted KIP projects, were seconded to the PIU too. But because of their other commitments, the project director as well as seconded staff were unable to devote full time attention to the project. In addition many difficulties were encountered in harmonizing the activities between the PMU which was mostly controlled by Cipta Karya and the PIU which was under the overall purview of DKI Jakarta.

5. Project Results

1.17 Measured against the stated objectives, the project results are at best described as mixed. The institutional building objectives have substantially been achieved. The project achievements in other areas are not so apparent; on the contrary the shortcomings that were encountered during the implementation have pointed to the enormous difficulties which surround the prospect of replicating any features of this project in Indonesian urban areas.

1.18 Because of the pilot nature of the project no attempt was made in the SAR to quantify the economic benefits that would accrue from a sewage collection and disposal system. However, qualitative benefits such as possible reduction in the incidence of water-borne diseases, infant mortality, enhancement in the quality of life, and prospect for greater economic activity were seen as important factors. As a proxy for an ERR the SAR determined that the computed 5.4% financial rate of return (para. 2.4) of the sewerage operation combined with other qualitative benefits were considered to be satisfactory. The PCR made no attempt to quantify any economic benefits as no meaningful data were available for an analysis of this kind. Furthermore, it has not been possible, largely due to delays encountered in the on-site sanitation program as well as in the sewerage component, to positively identify any social and public health benefits which could have accrued to the community as envisaged in the SAR. Although the sewerage system has been able to achieve a financial break-even point, its limited coverage precludes it from achieving any benefits beyond its current levels.

Institutional Objectives

1.19 A financially autonomous sewerage entity has been established under the governor of DKI Jakarta. The sewerage entity code named PDPAL Jaya, headed by a manager, is organized into three main functional divisions, namely, maintenance, supervision and monitoring, and finance and administration (Appendix A). The management and staff of the entity are appointed by the governor of DKI in conjunction with the ministry of Home Affairs. The entity's obligations are still evolving, but initially they include responsibilities for operations and maintenance of current and future sewerage services in the Jakarta area. The powers and responsibilities of PDPAL Jaya are embodied in detail in a local government ordinance governing sewerage and waste water disposal in the DKI Jakarta area. The tariff structure (Table 6(b)) whose details are in the ordinance embodies a mechanism for a full cost recovery in the longterm and fosters the financial viability of the sewerage entity. The tariff mechanism which features notable cross-subsidy among categories of customers is subject to periodic reviews and so far has met no apparent resistance from the major customers. Under the JUDP II project, the Borrower made an undertaking in the Loan Agreement that called for the sewerage operation to achieve at least a break-even point on a cash basis in the short run, and to contribute significantly towards future investments in the long run. The sewerage entity has so far achieved its short-term objective of a cash break-even point. At the completion of the project, the newly established sewerage entity, PD PAL Jaya, was being readied to take over the sewerage assets created under the project from Cipta Karya, the implementing agency, and become responsible for the management of the sewerage system, including customer connections, billing and operations and maintenance. During the transition period preceding the establishment of the PDPAL Jaya, an interim sewerage entity was established under Cipta Karya by a Minister's decree. The interim entity, code named BPAL, continued to be responsible for managing customer connections and administrative functions of the newly created sewerage assets until the estimated handing over date of April 1, 1992 to the PDPAL Jaya. PDPAL Jaya is in its formative stage; it therefore remains weak requiring proper staffing and training of new staff. It will, in the meantime, continue to be supported through technical assistance which is currently being provided under the JUDP II loan.

Sewerage Component

1.20 After observing long and persistent delays in the project implementation, the Bank and the Borrower re-evaluated the project; they came to the conclusion that yielded the decision to scale down the scope of the project to achieve a reasonable completion, and in early 1988 an agreement was reached on a reformulated project consisting of two stages. Stage 1 of the reformulated project was determined on the basis of GOI's capability to complete a reduced but fully functional sewerage system which would have no worse than neutral environmental impact in the area. As a result of the project reformulation, several schemes were deferred and a selected group of these schemes were earmarked for assessment with a view to including them in the next generation of similar projects. Stage 2 of the project consisted of such components from the original project scope which were identified and appraised as components of the on-going JUDP II Project, which was under preparation at the time. The size of Stage 2 of the sewerage system, which became components of JUDP II project, was determined so as to increase the sewerage service area of Stage 1 to fully utilize the capacity of the two sewage treatment ponds at Setia Budi and to enhance the financial viability of PDPAL-Jaya by focusing on the service area where commercial properties are concentrated. Although the original physical targets for construction were not achieved in practically all components due to the problems which resulted in the reformulation of the project scope, the somewhat limited objective of completing a fully functional sewerage system with no worse than neutral environmental impact, albeit small, was achieved.

Sanitation Component

1.21 This component which consisted of constructing leaching pits, communal sanitary facilities (MCKs) and public water taps through extensive community participation was to be the key project instruments for providing low-cost human waste disposal solutions to high-density and low income Kampung. As table 3(a) shows this program failed far short of its physical targets and subsequently was assessed to have made no noticeable improvements in the sanitary conditions of the area. The extensive involvement of the community which was brought in at some stage of the implementation did little to change the fundamental problems associated with this component particularly in the high population density areas to which the program was especially focussed. Despite this unsatisfactory experience, the on-site sanitation program has been carried forward into JUDP III project, making it one of its center piece program for community participation. The community participation effort under this component focussed on health education campaign and organizing communities into Sanitation Action groups. Local non-governmental organizations were extensively used to inform the community about the project and its benefits. The community participation will have to be carried out in more innovative ways than has been done under this project if the sanitation program under JUDP III project is to achieve better results. A number of prominent problems present themselves as being responsible for the unsatisfactory results which could also impact adversely on the implementation

of these schemes under the JUDP III project. During the implementation it became clear that a combination of obstacles which were not adequately evaluated forced the project management to reduce the applications of on-site sanitation technology in these areas to a fraction of previously determined assessed sanitation needs (para. 2.20). Early surveys showed that leaching pits were unsuitable in areas where population densities are high, ground water level is shallow, soil permeability is below a specific standard, and space for a twin pit system is not available. Other difficulties were encountered in providing the small credit scheme under the project. The success of the on-site sanitation program heavily depended on the willingness of the households to apply for such credits offered through the Project Implementation Unit. Under the credit scheme, households who applied for the loan received the loan in either a completed facility constructed by the project or construction materials paid for by the project on behalf of the household. Many households who preferred cash loans did not build the on-site facility on their property because the project agency was unable to provide cash credits due to government regulations prohibiting transfer of cash to individuals. To other households it was a question of affordability. The average cost of a twin-pit latrine was in the Rupiah 350,000 to 450,000 range payable over a five year period, which many households perceived as unaffordable. As a result, far fewer than planned households applied for the credit. The issue of a credit delivery system remains unresolved today even as JUDP III project has entered the full implementation phase. Inevitably implementation of this component will be adversely affected if this issue is not resolved soon. In addition, even in the areas where such facilities as MCKs were built the usage by community was so low that the impact of such units on public health safety in such areas remains questionable. To the extent that some 700 leaching pits out of the 3000 originally planned were constructed some of which with unacceptable design specifications, little evidence has been documented to demonstrate any degree of success in achieving project objectives under this scheme.

Drainage Component

1.22 The results of a drainage inventory and flood survey conducted during the project implementation pointed to the fact that the problems with flooding in the area are caused principally by undersized and poorly maintained primary and secondary drains. The tertiary drains which comprise 85% of the total length of drains in the site were found to have only minor problems associated with clean up of solid wastes but frequently lack adequate outlets for discharge. The solutions to the microdrains which are generally characterized by too narrow call for construction of hydraulically adequate channels and access for their maintenance, which inevitably involve difficult problems associated with land acquisition and resettlement of people. In view of the problems involved combined with cost escalations, the scope of the drainage program was scaled down, and the required improvements in the revised scheme which was constructed resulted in significantly reduced flooding in the area. Many of the secondary and primary drainage programs, which were deferred during the project reformulation, were considered good candidates under the JUDP III project.

6. Project Sustainability

1.23 The key issue about project sustainability centers on the management of future operations and maintenance of the project facilities. One of the achievements of this project is the establishment of a semi-autonomous sewerage entity under DKI Jakarta. IDPAL which is just coming out of its formative phase will be responsible for satisfactorily operating the sewerage system (sewers, pumping stations, and stabilization ponds) using the authority vested in it including the authority to charge and collect revenues under the laws of DKI Jakarta. The management of PDPAL is being strengthened under the on-going JUDP II project, sewerage extension components. The sustainability of the sewerage system is therefore dependent on how effectively PDPAL will function in delivering sewerage service in the area.

1.24 The sanitation schemes built on private property are presumed to be maintained adequately by the owners. However, in the long run desludging and sludge disposal remain a city-wide problem. The MCKs were found to be well maintained and clean, but appeared to be generally unpopular with the communities with utilization as low as 30%. Often times the MCKs are managed by the head of a kampung (RT/RW) who charges tariffs for use which are generally not affordable by the community. Future application of MCKs as a sanitation solution is becoming increasingly questionable in terms not only of its high construction costs and unaffordable tariffs, but also in terms of the impact on public health condition of the community. Often times discharges from the septic tanks to which MCK effluents discharge, flow into the open drains which most households in the neighborhoods use for human waste disposal.

7. Environmental Aspects.

1.25 An important project objective at appraisal was to improve environmental conditions and public health in the area. Sewage treatment plants have always been associated with some adverse impacts on the nearby surroundings namely odour, aerosols and noise. The treated sewage either has a positive or negative impact on receiving water bodies depending on the original level of pollution. The partial treatment of sewage in the Setia Budi ponds, through oxidation using floating surface aerators provide safeguards against foaming. However there may be occasional problems associated with operations and maintenance of the treatment ponds occasioned by the quality and quantity of the sewage which can result in some odour and foaming. Such problems are not expected to exceed acceptable levels. The water of the Kali (river) Cideng into which the waste water from the ponds is pumped is usually heavily polluted and the improvement of the water quality is therefore negligible considering that the sewage is only partially treated.

8. Bank Performance

1.26 The Bank had recognized early that historically little attention had been given to safeguarding and improvement of public health in Indonesian cities. The government had chosen Jakarta as the location where the Bank's

initial efforts for appropriate sanitation/public health solutions were being sought. The Bank took direct interest by recommending to GOI and supporting the preparation of a master plan that would emphasize the inter-related problems of drainage, solid waste disposal and sewerage in Jakarta.

1.27 The master plan recommended the construction of a conventional waterborne sewerage system, serving part of Jakarta's population, with large interceptors and several pumping stations, and discharging all sewerage untreated, in the Java sea through sea outfalls. The total cost was estimated at US\$500 million (1976 prices) to be phased out in three stages.

1.28 The Bank did not accept the major conclusions of the master plan which emphasized a conventional waterborne sewerage on the grounds of non-affordability, inadequate water supply in the area and the local habits which were already adapted to the use of septic tanks and pit privies. The Bank considered the master plan proposal was also highly costly for many areas where it was perceived that lower cost nonconventional solutions appeared to be feasible. The Bank and GOI chose a coordinated approach that would test feasibility of appropriate sanitation technologies including non-conventional sewerage, and on-site facilities to be followed by a major water supply project. Against this background the project scope outlined in the SAR was adopted as the basis for detailed preparation of the project.

1.29 The Bank appraised the project and deemed it the first modest step in improving Jakarta's environmental conditions and public health of a population of upto 700,000 in the area. However, it was later found out that, this assumption of level of coverage used in the financial projections was not supported technically and overlooked the hydraulic capacity limitation of the Setia Budi ponds which can serve a population equivalent of only about 175,000. This discrepancy which was discovered during the project implementation later forced the revision of the financial projection of the sewerage service. Thus the sewerage schemes being constructed under JUDP II project is expected to provide for full utilization of the pond capacity after completion of works, and the cost recovery level will be far lower than was projected at appraisal due to the reduced size of population to be served.

1.30 In the 9 years covering the implementation period the Bank carried out supervisions of about 19 staffweeks per year on average. This supervision level is significantly higher than the recent staffweek allocations on similar projects. But despite these modest supervision resources delays caused by a variety of reasons continued to plague the project almost throughout the implementation period (para. 1.32). In the course of the missions, for instance, it was not uncommon for the Bank missions to leave differences of views between them and project management unresolved which only exacerbated implementation delays. In several instances aides-memoire left behind by missions highlighted lack of progress on various aspects of the project, and often suggested or recommended actions which the Borrower often found difficult to interpret. For instance, in the case of the sanitation component the Borrower expressed dissatisfaction with mission's decision to blame delays on what it called project managements's conservative selection criteria for sanitation sites and high rejection rate of credit applicants. The implementing agency believed that the credit system criteria which it applied

were consistent with those provided in the guidelines for national strategy plan for human waste and waste water disposal and could therefore not be considered conservative. The differences between the views of the Bank mission and those of the project management were often left unresolved for considerable time after the issue of the aide-memoire. The project management at one time was openly reluctant to following advice from the Bank which it believed to be contrary to science, sound economics or Indonesian law; as a result several single pit privies were built inside the homes in direct conflict with established minimum design requirement of a twin-pit system with an inspection chamber outside the house. It is clear that the Bank performance in communicating its views with the Borrower about important implementation issues has not been as effective as should have been.

9. Borrower Performance

1.31 Both the Borrower and the Bank were deeply involved in the preparation phase of the project and recognized the complexity of Jakarta's human and solid waste disposal. But there were differences in the preferred approaches to addressing these issues. The Bank had viewed that even though the main focus of the project was on sewerage/sanitation improvements, the water supply situation was critical in terms of overall shortage and the dangerous water quality. However, in keeping its regional distribution policy and social equity considerations, the government priorities did not include a substantial water project for Jakarta at the time. The project scope, size, and location were in keeping with the government's overall development objectives for Jakarta.

1.32 Performance of GOI agencies during implementation was characterized by persistent delays during the start-up phases which affected practically every facet of the project, resulting in a substantial reduction of the project and a completion lag of nearly 60%. Performance improved in the latter part of the implementation period following the reformulation of the project. The following issues ranging from project specific problems to the broad country ones were in varying degrees responsible for the lion's share of the delays.

(a) GOI Procurement Procedures:

GOI performance in processing tenders and issue of requisite permits to contractors, particularly for sewer construction works was less than satisfactory. The average period between bid opening and award of contract was as high as sixteen months in the beginning; it tapered down slightly to as low as fourteen months which was still in excess of GOI's target of eight months for the processing of ICB construction contracts. These delays were further compounded by often unsatisfactory contractors performance attributable to inexperience of contractor personnel, insufficient or inappropriate equipment, and inadequate cashflow. Too often instructions to contractors were conflicting causing revisions to works which could have been avoided. Borrower's procurement procedures could benefit immensely by improving contractor prequalification procedures in order to exclude contractors who do

not have the right experience, capability and financial standing. In addition, proper construction supervision would be necessary to minimize unnecessary revisions of works which add to the project cost.

(b) Shortage of Counterpart Funds

Since 1985 the government experienced severe rupiah budget constraints which affected all on-going donor financed projects in the country. Often times payments to contractors for either completed works or contracts mobilization were delayed which tended to aggravate the tenuous cashflow situations of many contractors. The shortage of counterpart funds forced the government and the Bank to increase the Bank's share of financing for certain expenditures to enable the Borrower to take the project out of the implementation impasse.

(c) Weak Implementation Organization

The responsible implementing agencies of the Borrower, namely DKI Jakarta, and Cipta Karya were assigned to collaborate and share responsibilities, but this proved to be more difficult than had been expected. The arrangements for sharing responsibilities called for Cipta Karya and DKI Jakarta to cooperate, but the key decision making powers regarding contracting of works which carried great spending influence rested with Cipta Karya effectively leaving DKI Jakarta with little incentive in the project. DKI Jakarta's commitment to the project wavered as it felt left out in the important decisions causing the project management to suffer from inadequate personnel for most of the period. The role of DKI Jakarta personnel in the implementation team was particularly important for the sanitation component since DKI staff were believed to have had previous experience with such schemes under the implemented KIP programs in Jakarta. The sewerage and the drainage program were mostly handled with the help of consultants who had adequate experience in such schemes but limited experience with the on-site low-cost sanitation solutions.

(d) Institution Building Problems

The borrower's decision making process regarding the establishment of an appropriate sewerage entity took much longer than had been expected, largely because it was intricately diffused involving Ministries of Public Works and Finance and the government of Jakarta. In the effort to comply with a loan condition, Cipta Karya (MPW) established an Interim Sewerage Unit (ISU), code named BPAL, under the Project Management Unit (PMU) which would take over the sewerage facilities as their construction was completed. However, the BPAL was without powers to make customer connections, charge for sewerage services, or collect and retain revenues for use in operations and maintenance of the sewerage system. DKI Jakarta which is responsible for granting the BPAL powers to charge

and collect revenue from customers had not made the decision because the BPAL was not yet an entity under its jurisdiction; the Ministry of Finance was reluctant to permit BPAL to retain its revenues because it was treated as part of an on-going project under Cipta Karya and like other operating facilities while construction is in progress, revenues generated by it are turned over to the Ministry of Finance; and the Ministry of Public Works was reluctant to provide operating funds for the BPAL once the construction was completed at which time funding become DKI Jakarta's responsibility. Considerable time was spent in attempting to resolve these differences of view about the establishment of the sewerage entity. In 1989, when the Borrower submitted a request for a loan closing date extension, the Bank made the closing date extension conditional upon the Borrower's decision being satisfactory to the Bank for equipping the BPAL with the requisite powers and on a definitive form of the sewerage enterprise. The GOI complied with this condition, as an appropriate institutional framework with the requisite powers was agreed. The Bank granted a loan closing date as requested. The delays encountered in the establishment of an appropriate sewerage entity for Jakarta underpin the inherent difficulties projects with local institution building as an objective face. Often times three ministries are involved in addition to a beneficiary local government of the project. Much preparation is needed in coordinating respective roles of these ministries during the planning, implementation, and handover of the project assets to the local government to minimize problems at the implementation phase.

10. Project Coordination

1.33 Relationship between the Bank and key government agencies, particularly the Ministries of Public Works and Finance and the government of the special province of Jakarta (DKI Jakarta) were generally normal throughout the course of the project. Under this project the Bank, Ministry of Public Works and DKI Jakarta have been engaged in forward looking constructive dialogue which not only generally guided project implementation but complemented the efforts which were directed to the development of the next generation of urban projects in the Jakarta metropolitan area. The preparations of both JUDP II and III projects (on-going) especially benefitted from the technical assistance provided under the JSSP.

1.34 At the implementation level the relationships between Bank missions and the project management were not in harmony on several issues (para. 1.28). The Bank missions continued falling back on an earlier perception formed during the project preparation that the consultants to the project management team had not been adequately encouraged by Cipta Karya to recognize the appropriate emphasis on the on-site sanitation, in favor of the conventional sewerage. On the other hand, the project management tended to view Bank missions as overlooking the practical problems facing the implementation of the on-site sanitation program and sometimes left aide-memoires which were confusing. Overall communications effort between the Bank and the Borrowers

on this subject, in particular, and on the project as a whole were not as effective as should have been.

1.35 Relationship between Cipta Karya and DKI Jakarta did not establish the right environment for sharing responsibilities. The Project Management Unit (PMU), responsible to Cipta Karya and the Project Implementation Unit (PIU), responsible to DKI Jakarta were generally unable to coordinate work between them; eventually as pressure to improve implementation was mounting both from the Borrower and the Bank, the PMU assumed the bulk of the implementation work except for the customer connection which was carried out by the PIU. As the eventual owner of the sewerage system DKI staff should have been given substantial responsibilities for contracting and supervision of the construction, which was for practical purposes carried out by Cipta Karya appointed staff and Cipta Karya appointed consultants. DKI's lack of interest in the sewerage system was probably responsible for part of the project delays which were attributable to issue of construction permits. The less than satisfactory relationship had made DKI Jakarta to require that the sewerage system must reach a financial break-even operation before it can accept to take it over for future operations and maintenance.

11. Consulting Services

1.36 As has been traditional for Bank operations in Indonesia, consultants played a prominent role in all aspects of the project from preparation through implementation. The spectrum of services consultants provided or was expected to provide included: (a) project preparations including for JUDP II and III projects, (b) detailed engineering designs, (c) tender documentation and bid evaluations, (d) construction supervision, and (e) progress report writing.

1.37 Although the performance of consultants was satisfactory, the many delays in various facets of the project have contributed unnecessarily to the perceptibly large share of consultant services in the overall project cost. However there was one fundamental issue in the relationship between the consultants and the project management that bears critical importance on the quality of construction supervision. For the most part consultant's role, especially in construction supervision was relegated to giving advice to the Borrower and assisting. It often fell short of taking specific responsibility for the quality of construction as their responsibility often ended with submission of a professional advice to the project manager. Instances of the project management overruling consultants' recommendations against contractors were not uncommon. For this reason in some instances the quality of construction especially in the sewerage and drainage works may not have been ensured by the supervision consultants who in this case did not have the supervisory authority.

12. Project Documentation and Data

1.38 Records and data generated and maintained by GOI during project implementation were generally adequate for assembly of the required inputs to this PCR. These records were primarily maintained at the Project Management Unit (PMU) and also with Cipta Karya. The Borrower's PCR was prepared with help from consultants and presented in Part II of this PCR. The Bank received quarterly reports of progress during the project implementation. These reports and other related documents were used as inputs in the preparation of this PCR.

13. Main Lessons and Issues

1.39 Lessons learned in this project from the Borrower's stand point are presented in Part II of this report. The following statements supplement those lessons in Part II, but also focus on a number of key areas which were being tested in the pilot concept of the project and highlight some of the key issues that remain unresolved.

Acceptability of Sewerage

1.40 The idea of a sewerage organization with enabling powers to levy charges for sewerage services was new in Jakarta and there was uncertainty about public willingness to pay.

Lesson: Based on the experience so far gained under this project the demand for customer connections which is also an indication of willingness to pay for sewerage service as a means of human waste disposal has shown that sewerage has a good potential in Jakarta. The demand expressed through public willingness to pay for charges based on the existing tariff rate and structure appears to exceed maximum sewerage system capacity which will be available after the second stage of the sewerage of JUDP II project is completed. The tariff rate and structure were designed to take account of long-term recovery of full cost of investment made in the sewerage system. The extent to which sewerage can play a substantive role in Jakarta's human waste and waste water disposal still remains an issue under debate. Apart from the high cost of sewerage construction which has an inverse bearing with service affordability for customers there are unanswered questions regarding treatment techniques which are environmentally safe and where such treatment facility would be located. There is also the question whether an ocean outfall as a means of raw sewage disposal is a feasible proposition both from an environmental view point and cost considerations. The Bank should continue participating in the dialogue with the GOI on its current efforts in exploring approaches for expanding sewerage service in Jakarta.

Potential for On-Site Sanitation

1.41 The leaching pit sanitation program under the project achieved far less physically than had been expected. In the 1,800 ha project area sanitation needs were assessed to be acute in one-third of the households. However, due to a variety of reasons, including lack of space, soil conditions, ground water conditions, etc. a maximum of about 16% of the household sites in need were considered feasible for an on-site sanitation facility. In addition, due to the high cost of construction many households did not want to take credit for the facility. The actual number of sites which were provided with on-site sanitation was far less than 10% of the assessed needs. With regard to the communal facilities, the target numbers for construction were in fact achieved, but the excessively high cost of construction of these units undermined the consideration of this alternative as a low-cost sanitation option. In addition, the MCKs were found not to be popular with majority of the kampungs as a result their use was generally very low.

Lessons:

- (a) The scope for expanding the application of leaching pit on-site sanitation facilities as environmentally safe means of human waste disposal varies markedly with the population densities of the areas considered. In the medium - to low population density areas of Jakarta where availability of space is normally not a serious problem many households already have some form of on-site sanitation facility, frequently a septic tank or a twin leaching pit system. In such areas efforts should continue to educate communities about the health benefits in order to expand the acceptance of such solutions where soil and other technical conditions of the sites permit. However, in the low-income high population density kampungs of Jakarta where space to build the appropriate facility is often not available the scope for the leaching pit system is very limited. Moreover, the construction cost of leaching pits was found to be too high excluding many households which would have otherwise considered the facilities. Providing safe human waste disposal facilities in high population density areas and where soil conditions, ground water level, and other technical considerations are unsuitable remains a challenge which will require experimentation with more innovative sanitation options which have so far not been tested in Jakarta. The application of a credit mechanism to such schemes did not achieve the intended objective of facilitating the sanitation program because the credit delivery was burdened by problems of its own. If a credit mechanism should be used for these schemes in the future its delivery system must not only be problem free but it must also be proven to be widely accepted by the intended beneficiaries.

(b) The MCK Program under this project and in Jakarta as a whole has so far not achieved wide spread and meaningful level of community acceptance for numerous reasons including non-affordability of the community, and the fact that such facilities are often viewed by individuals with negative attitudes as a public means of human waste disposal in the kampungs even though sanitation needs are acute. In addition, the high cost of construction experienced under this project raise serious doubts about Mck's replicability in Jakarta and elsewhere as a low-cost sanitation option. A recent report ^{1/} on public health benefits on MCKs found no evidence of public health benefits from the use of MCKs established in Indonesia. It is not uncommon to find some well used MCKs discharge untreated wastes to the neighborhood environment creating health hazards. However, limited application of MCKs with potential health benefits can be justified for such specific locations as market places, train stations, bus stations, schools, and in such areas of the city where large number of transient or homeless people dwell who have no possibility of access to private facilities. Such public facilities will have to be maintained and operated by a designated municipal or government agency to ensure sustainability. Further application of the MCKs program, particularly in the metropolitan locales which are characterized by high population density and low-income communities must be approached with sufficient caution, considering the following prerequisites in a descending order of their importance:

- i) the community calls for it and space to build is available;
- ii) it can be built within reasonably low construction costs;
- iii) availability of water at the Mck is regular and adequate; and
- iv) other technical and public health safety considerations can be met.

^{1/} "Review of Sanitation Experience" November 1990 by Lauren E. Silver.

II. BORROWER'S EVALUATION ^{2/}

Introduction

2.1 Preliminary engineering for the JSSP began in July 1981, Loan 2236-IND became effective in May 1983, and implementation continued through March 1991. During this nearly ten-year period, the project has been influenced by many individuals, agencies, and outside circumstances. Given this situation, it seems more appropriate to examine the JSSP in terms of issues and experiences, rather than the performance of any one group or institution. Such issues and experiences are numerous, but only those of importance and future relevance to both the Bank and to GOI will be discussed here.

Sewerage Component. Conceptual

2.2 From JSSP documentation predating Loan Appraisal, it is clear that a major reason for locating JSSP at the selected site was a desire to reduce the gross pollution of the Banjir Canal, hence the raw water entering Jakarta's largest potable water treatment facility at Pejompongan. Towards this end, the main features of the initial preliminary engineering designs were a sewer network in Setia Budi, pumping stations, and an outfall sewer. During the dry season, aerators in the Setia Budi flood control ponds would supply some degree of pretreatment to the collected wastewater before it was pumped across the Banjir Canal and discharged at a downstream point where it could no longer enter the city's water supply. During the wet season, the wastewater would bypass the flood control ponds and be discharged untreated. Although this discharge of only partially treated and untreated wastewater was highly undesirable, project finding constraints were such that this was seen as the only technically feasible method to achieve the immediate removal of large volumes of wastewater from the drinking water supply.

2.3 Prior to Loan Appraisal, this initial concept was modified in two fundamental ways. First, a decision was made to add an additional 12 km. of trunk sewers extending into Kelurahan Tebet/Manggarai to intercept the highly polluted dry weather flows (sewage) in the rivers and drains which passed through the JSSP area and discharged into the Banjir Canal; and, second, the pumping stations and outfall sewer were deleted. All of the collected flows were to receive treatment in the aerated lagoons before being discharged, via the Kali Cideng siphon, at a point downstream of the Banjir Canal.

2.4 Subsequent consideration of costs, benefits, and the financial viability of the new sewerage enterprise were based upon this revised project description. The population equivalents (1 p.e. = 200 liters of wastewater per day) to be served by JSSP were projected in the Staff Appraisal Report (SAR)

^{2/} This part of the PCR was taken, unedited, from the borrower's report received in the Bank in January 1992. The report was prepared with the help of consultants, who were most familiar with the project during its preparation as well as implementation, assisted the Borrower in the preparation and implementation of the project.

as being 332,000 in 1987, 564,000 in 1991, and over 700,000 by 1996, the increases to be achieved by progressive intensification of the sewerage networks. Based upon these projections and affordability studies, it was concluded in the SAR that JSSP would generate sufficient revenue to: cover operations and maintenance costs, meet debt service requirements, and make a small contribution to the funding of future investments. The FIRR over a fifty-year period was calculated to be 5.4 percent.

2.5 However, through an apparent oversight, these projections did not take into account the fact that the maximum flow for which even marginal biological treatment could be achieved by the aerated lagoons at Setia Budi was, and remains, on the order of 35,000 cubic meters per day, equivalent to a population of only about 175,000.

2.6 This limited treatment capacity represented only 53 percent of the requirement projected in the SAR for 1987 flows, 31 percent of 1991 flows, and 25 percent of those in 1996. The stated objectives of the JSSP sewerage component, both technically and financially, were, therefore, unachievable at the outset.

2.7 Physically, the project has now been scaled down so that the volume of collected wastewater will not exceed the maximum capacity of the aerated lagoons at Setia Budi. Financially, project goals have been revised to cover only operations and maintenance costs.

2.8 Lesson Learned: During preliminary preparation of any project, initial concepts and objectives will change in response to competing interests and needs and to the constraints of time and available funding. Special care is required to insure that the technical, social, financial, and economic aspects of a project remain internally consistent and mutually supportive during this period of change. In cases where project objectives are dependent upon future facilities, i.e., additional treatment capacity, interceptor sewers, etc., these future requirements need to be clearly defined and taken into account.

Sewerage Component. Implementation Delays

2.9 The date of loan effectiveness for loan 2236 was May 18, 1983. Completion of works was scheduled for March 31, 1987, and the original loan closing date was March 31, 1988. A reduced program of project works was completed on March 31, 1991, and loan disbursements ceased on August 14, 1991.

2.10 The JSSP was designated a pilot project because it included the first major sewerage program in Jakarta. Although no new technological ground would be broken, local experience with sewerage was limited, and the institutions and the institutional arrangements required for sewerage implementation had to be created from the ground up. In the early months of JSSP, the project consisted of a single Project Manager without staff or office.

2.11 Responsibility for the JSSP has been shared by the Government of Indonesia (GOI) and the Government of DKI Jakarta (DKI). In practice, this

has meant that the interests and requirements of these two levels of government, acting through their separate agencies, have, of necessity, been addressed in all aspects of JSSP. The interests and requirements of the IBRD have also been addressed. As might be expected, the harmonizing of these various requirements has posed a major challenge to the JSSP Project Management Unit (PMU) and has been a major cause of the delays in implementing the sewerage component.

2.12 In the thirteen months following loan affectivity: the Directorate General of Human Settlements (Cipta Karya) had completed a reorganization reflecting the increased importance of its activities in the environmental sanitation sector, JSSP offices had been equipped and staffed, construction contractors approved, and tenders for the first two sewer construction contracts had been received on June 27, 1984. At this point, the laboriousness of the contract approval and construction permitting process became apparent.

2.13 This was particularly the case for sewer installation contracts involving the construction of sewers in the streets of DKI. Of the seven major sewer installation contracts undertaken by JSSP, the average period between tender opening and the commencement of actual construction was more than sixteen months. By project completion, this processing time has been reduced to fourteen months, but was still in excess of the GOI goal of eight months for the processing of ICB construction contracts.

2.14 In addition to the procedural delays, the time required to complete works under construction contracts normally exceeded the periods specified in the contracts. Six of seven major sewer installation contracts averaged 42 percent time overruns. There were numerous causes including: inexperience of the contractor's personnel, insufficient or inappropriate equipment, occasionally conflicting instructions to the contractors, revisions to works in progress, and irregular cash flows.

2.15 An additional cause of project delay was the financial difficulties faced by GOI in 1984/1985 during to falling international oil prices. After the initial tenders in June of 1984, no new construction contracts were tendered until February 1986, following an agreement with IBRD to use the proceeds of Loan 2236 for 100 percent of the construction costs of certain contracts.

2.16 Taken together, all of these delays resulted in an 8-year, rather than a 4-year, implementation period, for JSSP and have had significant negative impacts upon the project. Of these, the two most important are 1) that construction cost inflation exceeded initial allowances for price contingencies and 2) technical assistance costs increased proportionally.

Lessons Learned:

- (a) Delay is very expensive. Successful efforts to expedite contract approvals and construction permits and to improve the administration of construction contracts would prove to be very cost effective.

- (b) Unforeseen financial difficulties encountered by the Borrower can result in project delays. A contingency funding plan might be appropriate in future projects.
- (c) The implementation of major sewerage works should begin with the treatment facilities and then proceed outward. In this way connections, hence revenues, would begin at the earliest possible time, and, in the event of delays, all completed works would be operational.

Sewerage Component. Institutional Development

2.17 A major objective of the JSSP was the establishment of a sewerage institution under DKI Jakarta. Achieving this objective was delayed in part by rigorous institutional requirements and by the delayed implementation of JSSP physical works. A major requirement for the creation of the permanent sewerage institution was that its tariff revenues at least equal its operations and maintenance costs. That requirement will be met this year, and the sewerage institution, PDPAL JAYA, will be in place at that time. This institution is still extremely weak, particularly in technical areas, and will require considerable inputs if it is to assume a leading role in the development of sewers in Jakarta.

Lesson Learned:

In sewerage programs where financial viability is dependent upon cross-subsidies within the tariff structure and high revenue connections, consideration should be given to initially assigning priority to the implementation of the high revenue portions of the system.

Sanitation Component. Leaching Pits

2.18 The JSSP contained a largely experimental program to introduce on-site sanitation solutions into an existing highly urbanized environment. Three thousand twin leaching pit units were to be constructed in the site. Actual accomplishment fell far short of this goal. Some of the difficulties encountered and the reasons for this shortfall are discussed below.

2.19 The JSSP site covers approximately 1,780 hectares with a resident population of about 460,000. The gross population density of the site is therefore 258 persons per hectare (pph). The site is sub-divided into 15 Kelurahan with gross densities ranging from 54 to 559 pph. These Kelurahan are further sub-divided into 154 Rukun Warga (RW) with gross densities from 23 to more than 1,000 pph. The RW's are sub-divided into more than 1,500 RT's with a very wide range of population densities. The correlations between low-income, high population density, lack of access to piped water, and lack of sanitation facilities were clearly observed during the project.

2.20 After an initial false start in which it was found that the selected working area had largely impermeable soils, percolation tests were made throughout the site and a house-to-house survey of all dwellings was made to determine total sanitation requirements within JSSP. It was found that of the

approximately 75,700 total buildings, about 11,350 had no sanitation facilities of any kind. An additional 11,700 had unsafe facilities--commonly a toilet directly connected to an open drain. Altogether, approximately 147,000 JSSP residents (32 percent of the total) lacked safe sanitation facilities.

2.21 As a first step toward selecting working areas most favorable for on-site leaching systems, the collected survey data was screened following draft guidelines prepared by the UNDP for use in Indonesia. All Rukun Warga with gross population densities in excess of 500 pph were excluded from further consideration. Implementation was then begun in the less dense RW's where soil permeability permitted a long term application rate of at least 5 liters per square meter per day.

2.22 Implementation resumed, and within a short time a few hundred units had been constructed. But it quickly became clear that there was a serious shortage of buildable sites. Within the screened, lower density RW's, the needs for sanitation facilities were located predominantly in sub-communities so densely developed that there was no outdoor space available for the construction of leaching pits.

2.23 A second house-to-house survey was made in the lower density RW's to determine how many permanent homes with a sanitation requirement actually had a site available for the construction of a leach pit. The results were that only 23 percent of these homes had a buildable site.

(It should be noted that the objective of the second survey was to identify potential sites for the construction of leaching pits under the JSSP program. Residents of temporary housing were not eligible for the JSSP credit program, and were not included in the second survey. Approximately 10 percent of the homes in the area covered by the second survey were classified as temporary. By observation, most of these temporary houses would not have had a site for the facilities.)

2.24 Following the second survey, investigations into the feasibility of communal leaching facilities were undertaken. Five communities expressing keen interest in improved sanitation were mapped and studied in detail. A buildable site was found in only one of the five, and it could not be used because of property ownership issues.

2.25 Ignoring all other factors except site availability, the JSSP experience with leaching pits could be extrapolated as follows:

Total Sanitation (32 percent)	23,050 units
RW Density > 500 pph (37 percent)	(8,525) units
Transients (10 percent of remainder)	(1,450) units
RW Density < 500 pph but without suitable site (77 percent of remainder)	(9,410) units
Total Fundable and Buildable	3,665 units
As percentage of sanitation need	16 percent

2.26 Additional difficulties, particularly housing demolition associated with land redevelopment in the site, further reduced the number of buildable on-site sanitation units. At the end of JSSP, only 778 units had been processed. The average cost was approximately Rp 435,000 (US\$225) per unit, or about US\$36 per capita. The units constructed were so widely disbursed that no public health benefits are anticipated.

Lessons Learned:

- (a) Unless land use is extremely homogenous within a given area, population density is a misleading indicator of the future success or failure of on-site sanitation programs. Within JSSP, the greatest needs for improved sanitation were in the lower-income, higher-density neighborhoods where it was not possible to achieve any meaningful public health benefits because insufficient land was available for the construction of on-site facilities. In communities where sufficient land was available, such facilities were most often already in service, and there was little need for improvements.
- (b) The question of an appropriate response to the sanitation problems of high density communities is still unresolved. An intensive effort to resolve this question definitively is needed if the benefits of improved sanitation are to be extended to the lower-income portion of the urban population.
- (c) With lower-income communities, public awareness of sanitation problems was quite high, and the community was very willing to participate in any workable program toward the solution of these problems. The potential importance of community based programs for sanitation cannot be overstated. In this regard, cash credit programs, which are not presently permitted by law, might prove helpful.
- (d) Physical factors such as soil permeability and depth to the ground water table require careful evaluation before sites for on-site sanitation are selected.

Sanitation Component. Public Toilets

2.27 The JSSP also included the provision of public bathing, laundry, and toilet facilities (MCK's). Actual accomplishment exceeded that called for in the SAR, and MCK's providing a total of 256 toilets were constructed. Site acquisition costs average Rp 330,000 (US\$170) per toilet seat provided. Building construction costs, including the bathing and laundry facilities, average Rp 1,100,000 (US\$565) per toilet seat. The cost of connecting city water to the MCK's averaged Rp 3,625,00 (US\$1,860) per toilet seat. The total cost was therefore Rp 5,055,00 (US\$2,595) per toilet seat provided.

2.28 In 1989, a small sample survey of MCK usage was conducted. The residents of the ten homes nearest each of eighteen randomly selected MCK's

were interviewed about their use of the facilities. Although too small to be definitive, the survey indicated that the public toilets were actually being used something less than 30 percent of the time for sanitation purposes. The reason most often given was that the entrance fees of Rp 100 per entry were too high.

Microdrainage Component

2.29 The physical objectives of the JSSP microdrainage component included the construction of new drains and the rehabilitation of some existing minor drains. Early in the program it became clear that while areas which flooded could be readily identified, the causes of that flooding and appropriate solutions were not easily determined by observation alone. Accordingly, it was decided to undertake a pilot microdrainage planning program within JSSP to serve as a model for such programs in the remainder of Jakarta and in other Indonesian cities.

2.30 Because accurate planimetric and topographic maps were not available, a drainage survey was made. Approximately 660 km of drains were examined, and 100 km of the larger drains were surveyed in detail and assembled into a computerized hydraulic model. All microdrainage deficiencies and their solutions were identified and a report with recommendations was issued. Designs were prepared, and improvements constructed based upon the findings of the microdrainage study.

Findings Included

- (a) The major drainage problems within JSSP were man-made obstructions, including undersized drains. Housing and other real estate development activities within the site are creating obstructions at a far more rapid rate than remedial measures can be implemented. Effectively enforced drainage regulations are needed.
- (b) The microdrainage problems within JSSP were concentrated in the larger microdrains. Only limited problems were found in the tertiary drains which comprise about 85 percent of the total length of drains in the site. In those areas where the larger microdrains were adequate, the tertiary drains were being cleaned and maintained by the communities without outside inputs. From this it is concluded that future programs would most profitably focus on the larger microdrains, beginning with an evaluation of existing deficiencies. If JSSP is typical, programs focused on small drains, those with catchment areas of less than 1 ha., would be ineffective.
- (c) Current aerial photographs to a reasonable scale with superimposed and accurate topographic contours are essential to a cost effective microdrainage program.

Macrodrainage Component

2.31 The implementation of the JSSP macrodrainage component was inhibited by serious difficulties in acquiring sufficient land to construct the

improvements. Major drains in Jakarta are frequently too narrow, with existing housing along both banks of the channel. Under these circumstances, the construction of a hydraulically adequate channel and access for maintenance requires that property be acquired, buildings demolished, and people relocated. Such land acquisition is a sensitive and time consuming activity.

2.32 In response to the difficulties, the JSSP macrodrainage program was revised. The proposed major culvert under the Manggarai Railroad Yard was replaced by the reconstruction of an existing diversion channel within the existing channel right-of-way. Instead of reconstructing approximately 2.5 km of the Kali Bata, only the worst 500 meters were reconstructed, requiring considerably less land acquisition. The original objectives were largely achieved. These improvements significantly reduced the frequency of flooding locally, decreased the duration of flooding in other portions of the basin, and provided an outlet for future improvements upstream.

Lesson Learned:

Right-of-way acquisition is probably the most difficult problem facing urban drainage programs. Continued efforts are needed to provide mechanisms for more timely land acquisition.

III. STATISTICAL INFORMATION

Table 1: Related Bank Loans

Loan No. & Project Title	Year of Approval	Purpose of Project	Status	Comments
Ln 1653-IND Urban III	1979	Urban Infrastructure	Completed	Project achieved objectives
Ln 1972-IND Urban IV	1981	Urban Infrastructure	Completed	Project achieved objectives
Ln 2816-IND USL I	1987	Urban Infrastructure	Completed	Project substantially achieved objectives
Ln 3219-IND JUDP II	1990	Urban Water Supply and Sanitation	Under Implementation	Satisfactory
Ln 3246-IND JUDP III	1990	Urban Community Infrastructure	Under Implementation	Experiencing Delays

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Table 2(a): Loan Disbursement

Bank FY	Semester Ending	----- (US\$ million) -----		Actual as % of Estimate
		SAR Estimate	Actual	
1983	December 1983	1.1	0.2	18.2
1984	June 1984	2.2	0.2	9.1
	December 1984	5.6	0.3	53.6
1985	June 1985	10.1	1.7	16.8
	December 1985	13.4	2.4	17.9
1986	June 1986	15.7	3.6	22.9
	December 1986	17.9	4.6	25.7
1987	June 1987	20.2	6.5	31.7
	December 1987	22.4	8.8	39.3
1988	June 1988		10.5	
	December 1988		12.6	
1989	June 1989		16.3	
	December 1989		16.8	
1990	June 1990		19.2	
	December 1990		20.0	
1991	June 1991		21.7	
	August 1991		21.9	
	CANCELLED		0.5	

			22.4	

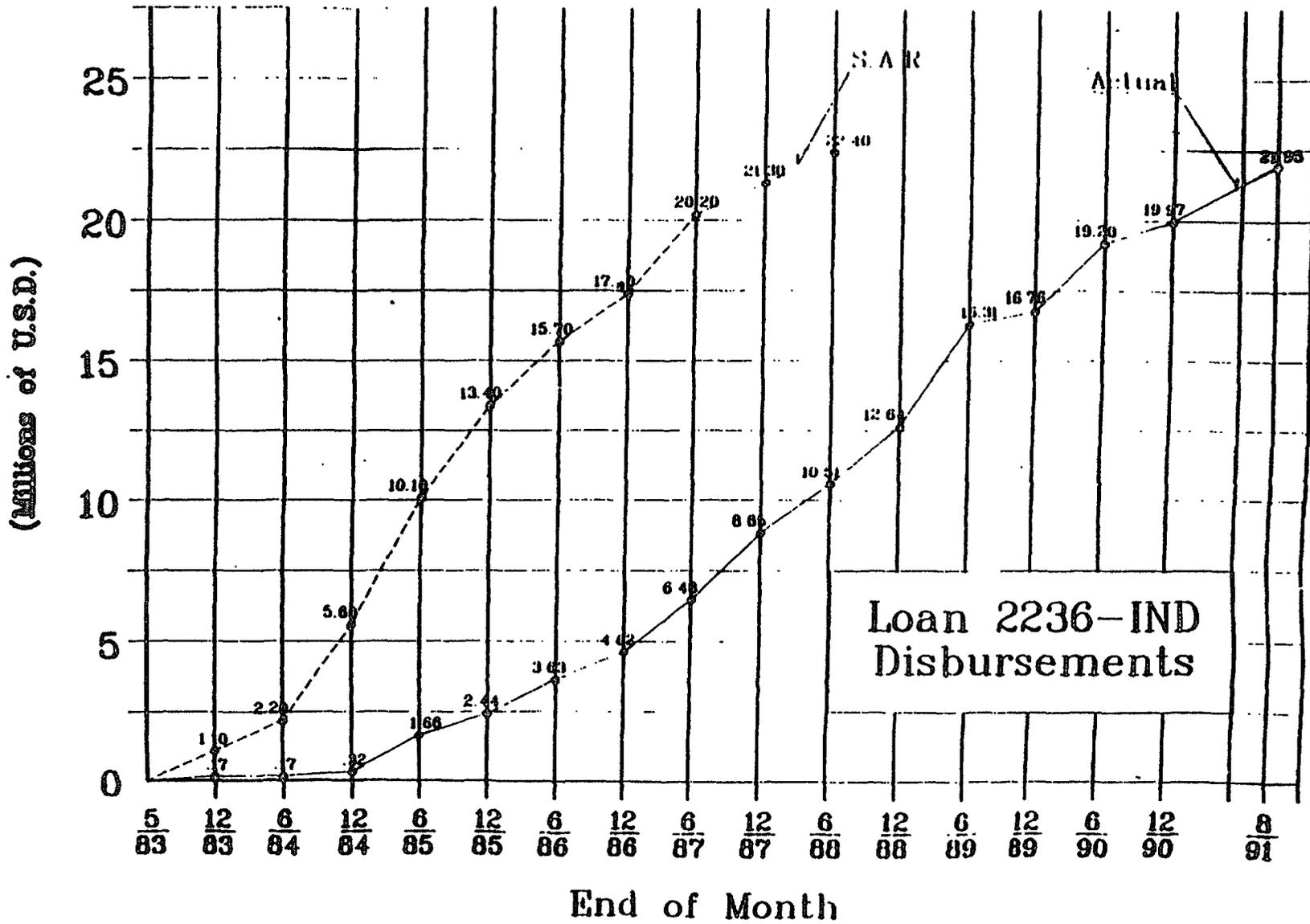


Table 2(b): Loan Disbursements

JAKARTA SEWERAGE AND SANITATION PROJECT
Loan No. 2236-IND

Table 3(a): Project Results Summary
Monitoring Indicators

<u>Components</u>	<u>Appraisal</u>	<u>Results</u>
<u>Sewerage Component</u>		
Setia Budi:		
- Primary Sewers (km)	7	4.8
- Other Sewers (km)	50	20.7
Manggarai Extension:		
- Primary Sewers (km)	12	2.4
- Other Sewers (km)	-	19.8
<u>Drainage Component</u>		
- Macro-Drainage (km)	4	2.0
Micro-Drainage:		
- Rehabilitation (km)	177	-
- New Drains (km)	27	9.3
<u>Sanitation Component</u>		
- Leaching Pits (no)	3000	778
- MCK's (no)	30/240 *	80/256 *
- Public Water Taps (no)	100	30

monind.tab

* Toilet seats

JAKARTA SEWERAGE & SANITATION PROJECT

PROPERTY CONNECTIONS AS INSTALLED
GROUP I, II AND III

Description	Number of Inspection Chambers			Length of Property Connections (metres)				
	House & Commercial	Hi-rise	Total	100 mm	150 mm	200 mm	250 mm	300 mm
Package 1	406		406	1,754	-	-	-	-
Package 2	188		188	828	-	-	-	-
Package 3	530	21	551	1,967	48	-	-	-
Package 4	366	11	377	1,619	16	-	-	-
Package 5	27		27	199	23	-	-	-
Package 7	473		473	1,775	-	-	-	-
Package 12	158		158	1,055	9	-	-	-
Package 14	379		379	2,494	80	-	-	-
Package 15	499		499	3,084	8	-	-	-
Package 18		22	22	-	(included in jacking pipes)			-
Total :								
Setiabudi	1,990	54	2,044	8,142	87	0	0	0
Manggarai	1,036	0	1,036	6,633	97	0	0	0
T O T A L	3,026	54	3,080	14,775	184	0	0	0
Total :								
Setiabudi						8,229		

Table 3(b) : Project Results Summary

JAKARTA SEWERAGE AND SANITATION PROJECT
 Loan No. 2236-IND

Table 4(a): Project Costs and Financing Summary
 -----in \$ million-----

	<u>SAR</u>		<u>Actual</u>	
	<u>Cost</u>	<u>₹</u>	<u>Cost</u>	<u>₹</u>
1. <u>Project Investments:</u>				
Sewerage	27.0	72	22.1	67
Drainage	4.1	11	2.5	8
Sanitation	2.4	6	2.1	6
T.A. and Training	3.6	10	5.9	18
Front End Fee	0.2	1	.2	1
TOTAL COST	37.3	100	32.8	100
2. <u>Financed By:</u>				
World Bank Loan	22.4	60	21.9	66
Government	14.9	40	10.9	33
TOTAL	37.3	100	32.8	100

Table 4(b): Project Costs Summary

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PROJECT COST SUMMARY
(AS USD)

Component	SAR			Actual		
	Local	Foreign	Total	GOI	IBRD	Total
	US\$ thousands			US\$ thousands		
Sewerage Service :						
- Land acquisition	820	0	820	563	0	563
- Civil works	7,300	7,580	14,880	5,907	6,660	12,567
- Plant and equipment	250	2,450	2,700	1,396	4,102	5,498
- Engineering	350	530	880	163	3,322	3,485
- Contingencies	3,930	3,850	7,780	0	0	0
Sub-Total	12,650	14,410	27,060	8,028	14,084	22,112
Drainage :						
- Land acquisition	10	0	10	209	0	209
- Civil works	1,750	760	2,510	1,260	505	1,765
- Plant and equipment	0	40	40	0	0	0
- Engineering	65	65	130	0	323	323
- Contingencies	1,030	410	1,440	0	0	0
Sub-Total	2,855	1,275	4,130	1,469	828	2,297
Sanitation Component :						
- Land acquisition	360	0	360	50	0	50
- Civil works	460	340	800	989	413	1,402
- Plant and equipment	50	410	460	11	100	111
- Engineering/Community	40	20	60	0	540	540
- Contingencies	400	300	700	0	0	0
Sub-Total	1,310	1,070	2,380	1,050	1,053	2,103
Institutional Development & Preparation of Future Projects						
	950	2,650	3,600	105	5,815	5,920
Front-end Fee	0	167	167	0	167	167
Total Project Costs	17,765	19,572	37,337	10,652	21,947	32,599

Table 4(c): Project Costs Summary

JSSP Technical Assistance Costs Detail

	US Dollars
BPAL Consultants	963,813
Financial, Audit, and Environmental Impact	181,136
PDAM Consultants	2,127,952
JUDP II Consolidation	313,795
JUDP II SP-4 Preparation	233,000
JUDP III Preparation	250,000
Microdrainage I (Inventory, Analysis, Training Preliminary Designs for Future, and Works Designed, but Deferred to JUDP II.)	495,203
Design of JUDP II and Other Deferred Works	1,100,000
Management Assistance by CRE (10% of time)	150,000
Sub-total	5,814,900

Sanitation

Engineering	50,000
Community Programs, NGO, & Program Management	290,000
Sanitation PIU Budget	200,000
Sub-total	540,000

Drainage

Microdrainage II, including macrodrainage works	323,190
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Sewerage

JSSP I Design and Construction Support	3,321,768
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Total Cost of TA 9,999,858.13

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Use of Bank Resources

Table 5: Staff and Consultant Inputs

<u>Stage of Project Cycle</u>	<u>Actual No. of Staffweeks</u>
Through Appraisal	82.8
Appraisal through Board Approval	41.1
Board Approval through Effectiveness	8.6
Supervision	169.5

B. Missions

<u>Month/Year</u>	<u>No. of Persons</u>	<u>Days in Field</u>	<u>Specialization Represented</u>	<u>Performance Rating Status</u> ^{1/}	<u>Types of Problems</u> ^{3/}
<u>Through Appraisal:</u>					
July 1980	2	14	FNA	1	
September 1980	2	10	FNA, CON	1	
<u>Appraisal through Board Approval:</u>					
March 1981	3	4	FNA, CON	1	
July 1981	2	16	CON	1	
November 1981	3	19	FNA, CON	1	
March 1992	2	10	MNG, FNA	1	
July 1982	3	19	FNA, CON	1	
<u>Supervision:</u>					
February 1983	2	9	MNG, FNA	2	M/T
December 1983	2	9	FNA	2	
March 1984	6	10	CON	2	
July 1984	2	7	FNA	2	
October 1984	2	27	MNG, FNA	2	
July 1985	2	14	FNA	2	
October 1985	3	18	MNG, FNA	2	
June 1986	3	14	MNG, OPO	2	
March 1987	2	7	MNG, CON	2	
June 1987	7	10	MNG, CON, FNA	2	
December 1987	2	10	MNG, FNA	2	
March 1988	3	7	MNG, FNA, CON	2	
July 1988	3	20	MNG, OPO	2	
March 1989	2	14	MNG, SNG	2	
July 1989	2	10	MNG, SNG	2	
November 1989	3	14	MNG, FNA, CON	2	
March 1990	2	8	FNA, CON	2	
June 1990	3	7	FNA, CON	2	
November 1990	3	15	FNA, CON, OPO	2	
February 1991	2	5	FNA, OPO	2	

1/ ECO - Economist; FNA - Financial Analyst; MNG - Municipal Engineer; UPN - Urban Planner; CON - Consultant; OPO - Operations Officer

2/ 1 - Problem-Free or minor problems; 2 - Moderate problems; 3 - Major problems

3/ M - Management; T - Technical

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COMPLIANCE WITH LOAN COVENANTS

Section	Loan agreement reference	Status	Remarks
3.01 (a)	Project execution efficiency	Completed	All Stage One works have been completed.
3.01 (b)	Coordination among DKI and CK	Completed. To continue in JUDP II.	Coordination and cooperation between DKI and CK is evident in the completion of JSSP Stage I, planning of JSSP Extension under JUDP II, and in sewer system operation and maintenance.
3.01 (c)	Establishment of project management and implementation units	Completed	
3.02	Engagement of consultants satisfactory to Bank	Completed. To continue in JUDP II.	(a) Alpiconsult/Encona continue to provide Technical Assistance for: a.1 JSSP Stage I Completion a.2 Planning and Design of JSSP Extension. (b) The Contract Amendment No. 1 covered JSSP Stage I through March 1989. Amendment No. 2 Provided TA through March 1990 for JSSP I Completion & limited design of SP-4. Amendment No. 3 continued services until the loan closing date of 31 March 1991. Consultant's services for JSSP Extension continue on basis of Cipta Karya letter of intent issued in March, 1991.
3.03	Insurance of project goods	Completed	

Section	Loan agreement reference	Status	Remarks
3.04 (a)	Documents review by Banks	Completed	Bank was informed, on a regular basis, of action, changes and adjustments relating to Project Implementation.
3.04 (b)	Project record keeping and reporting	In progress	See 3.04 (a)
3.04 (c)	Publication of award	Completed	No IBRD objection to publications of award.
3.04 (d)	Project completion	Completed	Closing date March 31, 1991.
3.05	Land acquisition	Completed	No outstanding land acquisition issues at this time.
3.06	Formal agreement between Cipta Karya and Water Resources for joint use of flood control ponds.	Completed	Agreement made and signed on 06 April 1990.
3.07 (a)	Completion of sewerage and water supply institutional studies by Dec. 21, 1984	Completed	Studies considered complete.
3.07 (b)	Discuss study recommendation with Bank by June 30, 1985	Completed	Recommendation reviewed February 1988.

Section	Loan agreement reference	Status	Remarks
3.07 (c)	Cause agency to operate sewerage system by April 01, 1986	Revised	The Interim Organization is in place at the Workshop and Office facilities in Setiabudi. Organization Development work and policy/procedure reviews continue. Physical connection of properties to the sewer system initiated in March 1989 and continues. BPAL workshop office is completed. Maintenance equipment now being delivered. Structure and level of tariffs have been approved. Process to covert BPAL to PDAL to continues and will be completed prior to December 31, 1991. Treatment ponds are now in operation.
4.02 (a)	Borrower to maintain financial records and accounts	Complied	FY 88/89 audit complete. FY 89/90 audit complete. FY 90/91 audit pending.
4.02 (b)	Provide audited accounts financial information to Bank	Complied	See 4.02 (a).
4.03 (a)	Sewerage system to achieve cost recovery	Revised	Tariff structure designed to achieve recovery of O&M costs.
4.03 (b)	Sewerage charge structure to be reviewed at 2-year intervals	Revised	The financial projection used for sewerage tariff evaluation assumes a tariff review every three years.
4.03 (c)	Surplus funds to be applied to sewerage system development	Revised	See. 4.03(a) and 4.03(b).
4.04 (a)	Project agencies to carry adequate insurance	Complied	GOI guarantee to replace assets is considered implicit.

Section	Loan agreement reference	Status	Remarks
4.04 (b)	Project agencies to be competent	Complied	Performance continues.
4.04 (c)	Project agencies to carry out effective operation and maintenance	Complied	O&M Chief in Place in as part of initial ISU Staff (See 3.07 (c)). Overseas training of selected O&M personnel completed . Maintenance equipment delivery and operator training complete.

Table 6(a): PD. PAL JAYA: Financial Information

<u>Customer</u>	<u>-----1990-----</u>				<u>-----1991 Forecast-----</u>					
	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>
<u>Residential</u>	965	965	965	965	965	965	965	965	965	965
<u>High Rise</u>	7	7	7	7	7	7	15	16	17	21

	<u>Customer Connections</u>								
	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>
<u>Residential</u>	965	965	965	965	965	965	965	965	965
<u>High Rise</u>	25	27	30	30	32	37	37	37	37

BPAL's current and future revenue performance is as follows (in Rupiah Millions) based on foregoing customer connections:

<u>Customer</u>	<u>-----1990-----</u>				<u>-----1991-----</u>					
	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>
<u>Residential</u>	-	-	2.1	1.2	1.2	1.2	2.4	2.4	2.4	2.8
<u>High Rise</u>	-	-	-	11.6	11.6	11.6	12.1	12.9	13.9	19.5
<u>Other</u>			1.8	1.8	2.4	2.4	2.4	2.6	2.6	3.2
<u>Total</u>			3.9	14.6	15.2	15.2	16.9	17.9	18.9	25.5
<u>O & M</u>			29.1	31.9	37.0	37.0	32.7	40.8	40.9	41.7
<u>Surplus (Subsidy)</u>			(25.3)	(17.4)	(21.7)	(21.7)	(15.7)	(22.9)	(21.9)	(16.0)

	<u>-----1991-----</u>						<u>-----1992-----</u>		
	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>
<u>Residential</u>	2.8	2.8	2.9	2.9	2.9	3.3	3.3	3.3	3.3
<u>High Rise</u>	25.1	29.7	30.7	31.8	31.8	37.1	46.3	46.3	46.3
<u>Other</u>	3.8	4.3	4.4	4.4	4.4	5.1	6.0	6.0	6.0
<u>Total</u>	31.7	36.8	38.0	39.1	39.1	45.5	55.6	55.6	55.6
<u>O & M</u>	42.3	43.3	43.5	43.7	43.9	44.5	45.6	45.7	45.3
<u>Surplus (Subsidy)</u>	(10.6)	(6.5)	(5.4)	(4.4)	(4.5)	1.0	10.0	9.9	10.3

• Expected SEP

JAKARTA SEWERAGE AND SANITATION PROJECT
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Table 6(b): Tariff Structure to PD. PAL JAYA

<u>Customer Category</u>	<u>Block I Basic Tariff</u>	<u>Block II Basic Tariff</u>	<u>Block III Basic Tariff</u>	<u>Block IV Basic Tariff</u>
DOMESTIC	.35A			
COMMERCIAL (Large)	A	3.85A	5.25A	5.6A
COMMERCIAL (Small)	A	1.1A	1.4A	1.5A
INDUSTRIAL	A	1.1A	4.2A	4.3A
SOCIAL	A	1.1A	1.7A	1.8A

The billing rate A was determined initially to be Rp 40/m³ across the tariff blocks for each customer category.

PDAL JAYA - ORGANIZATIONAL STRUCTURE

