PN-AB-212

FEASIBILITY STUDIES

ECONOMIC AND TECHNICAL

SOUNDNESS ANALYSIS

CAPITAL PROJECTS

JUNE 1, 1962

A.I.D.
Reference Center
Room 1656 NS

Department of State
Agency for International Development
Washington 25, D. C.

FEASIBILITY STUDIES

ECONOMIC AND TECHNICAL SOUNDNESS ANALYSIS

CAPITAL PROJECTS

JUNE 1, 1962

ERRORS AND CHANGES - No. 1 15 July, 1962

1. Page III-4, Para III.A., lines 5 and 6: Change as follows:

"Extent of use of existing facilities affected by the project, such as power stations, transmission and distribution circuits, fuel and water supplies, tanks, etc."

2. Page III-9, lines 3 and 4: Change "(copies attached)" to

"(attach copies)"

3. Page III-9, last line: Insert the words "power and" between "equivalent" and "energy", so as to read:

"equivalent power and energy"

4. Page IV-6, para. E. 1: Change last two lines to read as follows:

"Economic cost of the project including operation, maintenance, interest and depreciation."

5. Page XI-7: Change last two lines to read as follows:

"Economic cost of the project including operation, maintenance, interest and depreciation."

Initial Issue

June 1, 1962

FEASIBILITY STUDIES

ECONOMIC AND TECHNICAL SOUNDNESS ANALYSIS

CAPITAL PROJECTS

Consulting firms which are actively involved in, or are submitting proposals, for making feasibility studies for AID-financed capital projects may obtain copies of this Manual by application to the U. S. AID Mission, care of the local U. S. Embassy.

DEPARTMENT OF STATE

AGENCY FOR INTERNATIONAL DEVELOPMENT

GOVERNMENT OF THE UNITED STATES OF AMERICA

CONTENTS

Introduction

Chapters	Type of Project
I	All Types of Capital Projects
II	Industrial Projects
III	Electric Power Projects
IV	Agriculture and Irrigation Projects
V	Mining and Extractive Projects
VI	Port Development or Storage Projects
VII	Airport Projects
VIII	Telecommunications Projects
IX	Highway Projects
X	Municipal Street and Storm Sewer Projects
XI	Municipal Water and Sewerage Projects
XII	Railroad Projects
XIII	School or Hospital Projects

Annexes	Subject
A	Cost Estimate - All Types of Project
B	Circular No. A-47, Bureau of the Budget
C	Balance Sheet, Industrial or Commercial Project
D	Financial Information, Industrial or Commercial Project
E	Forecast of Earnings, Receipts and Expenditures, Industrial or Commercial Project
F	Production Cost, Industrial Project
G	System Requirements, Electric Power Project
H	Capital Costs, Electric Power Project
I	Annual Production Costs, Electric Power Project
J	Balance Sheet, Electric Power Project
K	Financial Projection, Electric Power Project
L	Benefit-Cost Summary, Hydro-electric Power Project
M	Computation of Benefits to Land Owners, Irrigation Project

ECONOMIC AND TECHNICAL SOUNDNESS ANALYSIS CAPITAL PROJECTS SUBMITTED FOR AID FINANCING

INTRODUCTION

I. ECONOMIC AND TECHNICAL SOUNDNESS CRITERION FOR AID DEVELOPMENT LOANS AND GRANTS

The Foreign Assistance Act of 1961 establishes six major criteria which must be taken into account in exercising the authority granted to the President to make loans and grants to promote the development of less-developed countries or areas. For both loans and grants one of these criteria is

> "the economic and technical soundness of the activity to be financed."

II. PURPOSE OF MANUAL

The purpose of this Manual is to provide guidance as to the kinds and extent of information which should accompany applications for loans and grants as evidence of the soundness of proposed capital projects,

a. to applicants to AID for financing
b. to AID personnel who have a responsibility for determining whether the projects meet the soundness criterion.

III. DEFINITION OF CAPITAL PROJECT

As used herein, the term "capital project" is defined as

> "Any specific, self-contained undertaking requiring total AID financing in excess of $100,000 which will result in the construction, expansion or alteration of a physical facility. This is interpreted to include capital equipment which requires substantive engineering and financial planning incidental to its procurement."

The guidance contained herein applies to all capital projects as thus defined, whether the AID assistance sought is in the form of a development loan, a development grant, a supporting assistance grant,

or any other AID dollar or local currency funds which may be used for the purpose.

IV. ECONOMIC AND TECHNICAL SOUNDNESS ANALYSIS

a. Required for all Development Loans and Grants. The material submitted with the application for a loan or grant which shows the extent to which the proposed project meets the soundness criterion is referred to throughout this Manual as the "Economic and Technical Soundness Analysis", "the Soundness Analysis" or simply "the Analysis". This Analysis, which is commonly referred to as an Engineering/Economic Feasibility Study, must accompany all applications for AID financial assistance for capital projects.

b. Purpose of the Analysis. The Soundness Analysis is a judgment aid, relied upon by the prospective owner and by the financing agency to evaluate the advisability of undertaking the project. It should integrate the results of engineering, economic, financial and other studies to arrive at a clear and exposition of the reasons why, insofar as technical soundness and the economic benefits and costs are concerned, the project is sound. The burden of proof is upon the applicant. The Analysis must be sufficiently complete, consistent with its size and complexity, to permit AID to make its own independent appraisal of the validity of the applicant's conclusions on the basis of the facts submitted and assumptions used.

c. General Criteria for Soundness. The soundness of a project will be judged by the following general criteria:

(1) Technical Soundness: A project will be considered technically sound if

(a) all pertinent technical aspects of the project have been taken into account in the analysis,

(b) the planned construction or procurement conform to accepted engineering standards and practice, suitably modified in light of the actual stage of development of the applicant's country, and its projected rate of development,

(c) the estimated cost of the project is as low as any other reasonably available alternate which would produce the intended results.

(2) Economic Soundness: A project will be considered economically sound if the resulting economic benefits over a stated period will equal or exceed the total costs of construction, maintenance and operation over the same period.

(a) Industrial Projects: The revenue must be sufficient to cover fixed charges, amortization, and maintenance and operating costs, and in addition produce an adequate return on the investment.

(b) Non-Revenue-Producing Projects: There must be a reasonable showing that the value of the benefits to the national economy will equal or exceed the total costs of construction, operation and maintenance; or (if applicable), the service of the loan.

(c) Non-profit Revenue-Producing Projects: Non-profit projects which produce revenue may or may not be completely self-liquidating. The total revenue and other economic benefits which can be evaluated must exceed the total costs over the life of the project.

(d) Water or Related Land Resource Projects: The 1961 AID Appropriation Act requires that the computation of benefits and costs for "new flood control, reclamation or other water or related land resource projects or programs" be made by the methods prescribed in Circular A-47 of the Bureau of the Budget, and that the standards and criteria of that Circular be met. This includes all projects involving water supply, regulation or improvement of waterways, hydro-electric power, and development and improvement of ports and harbors. A copy of Circular A-47 is attached as Annex B.

V. DEGREE OF PLANNING REQUIRED BY THE FOREIGN ASSISTANCE ACT OF 1961

a. Section 611 of the Act requires that- "engineering, financial and other plans necessary to carry out .... assistance" and "a reasonably firm estimate of the cost to the United States providing such assistance" shall be completed, before a loan or grant agreement is entered into, when the loan or grant fits the following description:

(1) It comes under the provisions of one of the following sections of Part I of the Act.

Chapter 2, Title I (development loans)
Chapter 2, Title II (development grants)
Chapter 4, (supporting assistance).

(2) If approved it would constitute an obligation of the United States

Government in excess of $100,000 under Section 1311 of the Supplemental Appropriation Act of 1955 as amended (31 USC 200).

(3) It requires substantive technical or financial planning. (All capital projects as defined in paragraph III will be considered to require "substantive" planning.)

b. Completed Engineering Plans. This refers to preliminary plans, sufficiently complete to provide the basis for a reasonably firm estimate of cost. The Soundness Analysis should include:

(1) preliminary investigations and surveys sufficient to identify all significant technical problems, establish the location, and fix those general criteria and standards of construction which will have a major effect on the final cost,

(2) a justification for the specific location, criteria and standards recommended, as compared with available alternatives,

(3) preliminary designs in sufficient detail to permit a reasonably accurate estimate of work quantities,

(4) an analysis of the construction operations in sufficient detail to provide a sound basis for the cost-estimate.

The preliminary engineering should extend only as far as will give reasonable assurance that all foreseeable costly and time-consuming "surprises" in the course of final design and construction have been eliminated.

c. Reasonably Firm Estimate of Cost. This refers to a preliminary cost estimate, based on the preliminary design discussed in the foregoing paragraph. As in the case of the design, the estimate should be carried only to a point which will insure that all significant factors which will determine the total cost of the project have been taken into account. Construction in less-developed countries is subject to unforeseen delays and built-in impediments due to local customs, laws and regulations, which affect the cost materially. All such contingencies should be evaluated as completely as possible in the Soundness Analysis, but to the extent that their probable effect on the project cost cannot be firmly established they must be provided for in a contingency item.

In addition to the cost of construction the cost estimate should include the costs of the final engineering, design and supervision of construction, and of the operation and maintenance of the facility for a forward period of not less than ten years.

d. Organization for Operation and Maintenance. A major factor in judging the economic and technical soundness of a project is the completeness of the planning as concerns its management and organization for operation and maintenance after completion of construction. With competent management a project may be successful despite inadequacies in the original concept. But no project, however well conceived, can overcome the handicap of poor management. On the other hand no manager, however competent or experienced, can succeed without the necessary personnel, equipment and materials required for effective operation and maintenance. The Soundness Analysis must show that these matters have been given thorough consideration.

If the project is of the public works type, to be operated by a Government Department or Ministry, the Analysis should give a description of the Departmental organization and strength, its budget, and its experience in managing projects of the type in question. In particular it should bring out in detail the suitability and adequacy of the agency in the field for handling the operation and maintenance of the specific project, with particular reference to maintenance equipment and personnel.

In the case of an industrial project the names, qualifications and experience of the proposed general manager and the key personnel of his staff should be submitted, together with detailed charts and tables showing the proposed operating and maintenance organization.

Projects involving advanced technology will usually require operation over an extended period under the direction of qualified contract personnel in key positions, as a condition of the loan or grant.

Of equal importance with the management and organizational structure is the planning of the manpower, materials and equipment requirements for successful operation of the project. Manning tables should be submitted, showing types and degrees of skill required for both the operating and the maintenance functions. The availability of local manpower to fill all key positions must be explored, and plans must be presented for the procurement and training of all personnel lacking, either as to numbers or skills. An adequate supply of special tools and equipment, and particularly of repair parts, must be foreseen and provided for. Where the operation is dependent upon an uninterrupted flow of some vital material, all possible causes of interruption to the flow must be thoroughly analyzed and guarded against.

If the plans for handling these and other problems are dependent upon assistance from or actions by outside agencies, the Soundness Analysis should show what assurance there is that such assistance will be furnished in the amount, and where and when required. The overall cost estimate for the project should include realistic estimates of the cost of implementing the plans for handling these problems of management, personnel training and maintenance, and should show how those costs are planned to be met.

VI. FORM AND CONTENT OF THE SOUNDNESS ANALYSIS

a. Matter Which May be Omitted. In addition to the soundness criterion, the Act prescribes other criteria which must be taken into account in approving AID loans and grants. In general the justification of conformance with these other criteria will be in other documents accompanying the application. To the extent that such matters have a significant bearing on the soundness of the project they should also be mentioned in the Soundness Analysis.

b. Use of Existing Documents. Reference may be made to documentation submitted previously to AID. However there is no assurance that such material will be readily available to the reviewing office; therefore the study must be self-contained.

c. Form of the Soundness Analysis. Chapters I through XIII of this Manual contain suggested outlines of the desired scope of the Economic and Technical Soundness Analysis for various types of projects. The material contained in Chapter I is applicable to all projects. Each of the remaining chapters contains the material applicable to a particular type of project. The Soundness Analysis need not be arranged to follow these outlines exactly; it is desired, however, that they be followed in general, with such modifications as may be dictated by the nature of the specific project.

Most projects will present particular aspects which are not covered by the outline or are covered inadequately. It is of the utmost importance that any such hidden factors which have a significant bearing on the soundness of the project by identified, analyzed, and fully treated in the Analysis. To insure that this is done Applicants should entrust the task of preparing the Soundness Analysis only to experienced consulting firms or individuals of established and recognized standing in their profession. There is no substitute for experience and proven professional judgment in this connection. Indications that the outlines have been used solely as check

lists without any attempt to ferret out the problems peculiar to the specific project may be expected to delay consideration of the application.

d. Extent of Analysis in Relation to Size and Complexity of Project. The foregoing discussion does not mean that all of the topics mentioned in the outlines must necessarily be covered specifically, regardless of cost, in the Economic and Technical Soundness Analysis. They must all be given consideration, however. The extent of the analysis of each topic, whether listed or unlisted, and whether or not it is mentioned, discussed or documented in the Soundness Analysis must be determined by the Applicant and his Consultants in light of the complexity of the project and the information which has to be presented to demonstrate its soundness. For all but very unusual projects the cost of the Soundness Analysis should not exceed 1 or 2 percent of the total project cost. Generally speaking the larger projects should cost proportionally less to analyze, but the degree of complexity will tend to counteract this general rule. Thus the analysis of a small but straightforward project may cost as much proportionally as a much larger project offering considerable technical difficulty and complex interrelationships with other elements of the long-range development program.

Funds spent on properly conducted Soundness Analyses are seldom wasted. Much of the data, such as wage rates, materials prices, transport charges, climatic data, etc., will be available for future Soundness Analyses, even though the particular project for which they were assembled may not be carried out.

CHAPTER I

ECONOMIC AND TECHNICAL SOUNDNESS ANALYSIS
ALL TYPES OF CAPITAL PROJECTS

(Topics listed in this Chapter apply to all types of projects, and to the extent applicable should be covered in summary form in an Introductory Section of the Economic and Technical Analysis).

Applicant

Official name.
Type of entity: individual, corporation, governmental agency, etc.
Date of establishment.
Principal purpose.
Organization chart, if a public body (attached).
If the Applicant does not itself plan to execute the project, give details of the intended arrangement with the agency which will have this responsibility, and a description of its organization.

Project

Nature, size and location of project.
Relationship to country's economic development.

Funds

Estimated total cost of the project.
Amount and source of funds supplied or to be supplied by Applicant for engineering, land, right-of-way, materials, equipment, labor, or other purposes.
Amount of financing requested from AID.
Source and availability of any additional funds required.
Extent to which the local government will waive or defer payment of direct taxes or import duties affecting project construction and operation costs.
Nature and amounts of any subsidies (industrial projects).
Currency control regulations and effective rate of exchange used in evaluating local currency in terms of U.S. dollars.

Present Status of the Project (if applicable)

The present status of investigations, surveys, borings, engineering design, extent to which construction contracts have been awarded (documented by tabulations and evaluations of principal bids thus far received), whether such awards were based on international bidding, and the progress of physical construction to date.

Construction and Funding Schedules

Planned construction schedule, broken down by major items of the project, in the form of a bar-chart, with explanations.

Schedule of anticipated expenditures in foreign and local currencies. (Procurement and delivery schedules for equipment should be included, or shown in a supplement).

Engineering Services

Plan for obtaining necessary engineering services for final design, preparation of specifications, preparation of contract documents, evaluating bids, awarding contracts and supervising construction. Include mention of any special consultants, and responsibilities to be assigned to them.

Procurement of Non-local Items

Planned procurement of major items of materials, supplies and equipment, recognizing current U.S. restrictions on source.

Construction

Plan for performance of construction work, particularly as to:

- Work to be done and materials and equipment to be supplied by Applicant.
- Work to be done by equipment suppliers.
- Work to be done by construction contractors, and type of contract.
- Proposed methods of obtaining bids and awarding contracts.
- Provision for bond for satisfactory performance.

Availability of technical, skilled and unskilled construction labor.

Availability of competent local subcontractors.

Local laws and regulations pertaining to import duties on personal property of contractors' personnel, personal income taxes, security requirements, visas, etc.

Laws and regulations pertaining to contractors' payments, local taxes on contractors' operations and earnings, and transfer of dollar earnings to U.S.

Operation and Maintenance

Plan for operating and maintaining the completed project, covering availability of competent personnel and proposed recruiting and training programs.

Source and availability of funds to be used for operation and maintenance, and foreign exchange funds required for imported supplies, spare parts, etc.

Soundness of Project

Conclusions regarding the economic and technical soundness of the project.

CHAPTER II

ECONOMIC AND TECHNICAL SOUNDNESS ANALYSIS
INDUSTRIAL PROJECTS

(Plants for production or processing of commodities or manufacture of products such as cement, steel, fertilizer, food, textiles, wearing apparel, chemicals, etc., including expansion of existing plants).

(All topics in this outline should be considered in the Analysis, in so far as they are applicable to the project. Others should be included as necessary to complete the demonstration of the economic and technical soundness of the particular undertaking).

(For a detailed discussion of a step-by-step procedure for developing an industrial type project, analyzing its technical and economic feasibility, and estimating both its commercial and national economic profitability the reader is referred to "INDUSTRIAL DEVELOPMENT - A Guide for Accelerating Economic Growth", by Murray D. Bryce (McGraw-Hill, 1960). Copies of this book will be available to all AID Missions, for the use of Applicants for AID financing).

I. SUMMARY

Type of plant and kind and quantities of commodities to be produced.
Location, illustrated by map showing surroundings and tie-in with transportation facilities and existing utilities.
Distances to sources of supplies and raw materials, and to markets.
Relation of project to Applicant's present operations, if any.
Benefits, cost and profitability.
Reference to any applicable reports (attached or readily available elsewhere).

II. COMMERCIAL ECONOMIC ASPECTS

A. Markets

Local or regional market trends during past 5 years for each major product and any closely related products, tabulated to show -

- Domestic production.
- Imports and exports.
- Net local consumption, and anticipated development of the local market.

4

Present per capita consumption in country, and comparison with other countries.

Local laws, regulations or customs affecting marketing of proposed products, including import and export duties, tariffs, quotas, restrictions and subsidies.

If part of proposed production is intended for export, show for each major product -

Number of units expected to be exported.

Proposed markets and costs of transport and import duties.

B. Applicant's Present Operations, If Any

Description of present operations, including those of subsidiaries or parent companies.

Complete financial statements including balance sheets, profit and loss statements and dividends paid for past 5 years (see Annexes C, D and E. Annual reports are usually acceptable in place of Annex C if reasonably equivalent information is given).

Present production capacity, for each product.

Sales volume and value of each product for past 5 years showing separate figures for domestic and export sales.

Domestic and export prices, f. o. b. plant, for past 5 years.

Estimated production of each major product in present plant for next 5 years.

Estimated additional production required to meet overall demand for next 5 years, including intended exports.

C. Competitors

Names, location, present and future output, production costs and selling prices of present local competitors in the same field of production.

Information as to any anticipated changes in competition, such as expansions, modernization, new plants, new competing products, etc.

Information as to foreign competition and any anticipated changes in laws or regulations which might affect volume of imports.

D. Competitive Position

Selling prices to be met in domestic and export markets.

Estimated transportation costs and export expenses.

Maximum competitive selling prices f. o. b. plant.

Competitive advantages of proposed project:

Relative availability and cost of labor.

Availability and quality of raw materials.

Efficiency of modern production equipment and processes.
Quality of products.
Dependability of supply to consumers.

E. Summary of Commercial Prospects

Schedule showing forecast of sales volume for the domestic market and each export market, and the percentage of the total market claimed in each case, with full explanation and justification.
Justification of the proposed capacity of the plant to be constructed.

III. ENGINEERING ASPECTS AND TECHNICAL SOUNDNESS

A. Design

Plant layout including storage for raw materials and finished products and provision for possible expansion.
Tie-in with transportation systems.
Types and size of major installed equipment items and structures, and justification of the selection of units and processes. (Avoid both obsolescent and experimental technology).
Function performed by each major unit.
Process flow sheet.
Auxiliary capital equipment (standby, spare parts, transport, materials handling, etc.).
Patents and licenses involved.
Planned capacity and build-up of output after start-up.
Estimated output as percentage of plant capacity for each of first 5 years of operation.
Anticipated use of consultants on special phases of final project design.

B. Utilities Available or to be Provided

Requirements, source, availability, cost and reliability of all utilities. Pertinent data on each system, and reason for selection of source in each case, including comparison of advantage of purchasing against in-plant production.
Power requirement in peak KW demand and annual KWH consumption, initial and future.
Electrical system shown by single line diagram covering major power uses.
Fuel for heat, steam and plant processes.

Water balance of the plant, where applicable. Problems relative to water treatment, disposal of effluents (liquid and gaseous), including any which may be noxious or dangerous.

Transportation facilities for raw materials and finished products.

C. Materials for Use in Manufacturing Processes

Quantity, specifications, source and availability of raw and semi-finished materials.

Proven reserves in case of minerals.

If semi-processed materials are to be obtained from another plant, evaluate the technical and economic soundness of such plant.

Estimated costs, possible cost variations, custom duties, any preliminary agreements on price and delivery and details of any contracts entered into for supplies and major raw materials.

Available facilities for handling and storing.

D. Plans and Specifications

Preliminary plans for all construction work in sufficient detail to permit calculation of work quantities.

Outline specifications for equipment and construction defining particularly those standards of quality which will have a significant effect on the cost of construction, with specific justification for any unusual standards adopted to conform with local conditions.

E. Construction Labor, Materials and Equipment

Manpower requirements and availability, including skilled and unskilled labor, and technical and supervisory personnel.

Local availability of cement, steel, aggregates, water for concrete, building stone, lumber and other construction materials.

Types of construction equipment required for the work, indicating what is available locally and what must be imported.

F. Special Construction Problems Foreseen

Climatic conditions, especially time and length of wet and dry seasons as they affect construction schedule and equipment use.

Necessity of keeping an existing plant in service.

Time required to obtain delivery of imported materials and equipment.

G. Plan for Execution of Project

General construction plan.

Proposed methods of contracting for engineering, construction, and construction supervision (see Chapter I).

Tests to be performed on completed plant.
Equipment guarantees to be required.
Engineering and construction schedules (attached).

H. Operating Organization and Quality of Management

Description of organization which will manage the business and supervise its operation accompanied by organization chart, present and projected.
Required number and qualifications of management and technical employees.
Experience records of available key management and technical personnel.
Number, qualifications and availability of required operating employees.
Plans for recruiting and training.
Provisions for competent management and maintenance throughout the life of the proposed loan.

I. Overall Technical Soundness

Justification of selection of location for project.
Proven reliability of plant processes and equipment.
Superiority of adopted processes.
Analysis of any adverse factors and measures to overcome them.
Assurance that plant described will produce the quantity and quality of products specified, on a continuing and dependable basis.

IV. FINANCIAL ASPECTS

A. Estimated Capital Cost

Estimates of cost of land, engineering and construction, prepared in accordance with Annex A so far as applicable.
Total estimated capital cost in U.S. dollars and local currency:
To be financed by Applicant.
To be financed by loan/grant.

B. Working Capital Requirements

Amount required at start-up of plant and at the end of the first, second and third years of operation, to cover raw materials, spare parts, auxiliary materials, goods in process, finished goods, accounts receivable and cash on hand.

Sources and availability of local and foreign currency funds required.

Anticipated occurrence of seasonal peaks in working capital requirements and method contemplated to meet such peak financial requirements.

C. Production Cost (broken down into local currency and dollar costs)

An estimate of the direct cost of producing each of the major products and any intermediate products, supported by detailed calculations. (See Annex F for suggested form).

Adopted wage rates and production factors used in production cost analysis, taking into account legal wage and salary scales, including all fringe benefits such as social security, vacation pay, medical allowances, displacement allowances and travel pay, etc.

Provisions included for personnel facilities such as transportation, housing, subsistence, recreation, medical care, etc.

Number of shifts and days of operation per year used in calculations, and basis for determination.

Governmental preferences or allowances taken into account such as (a) exemption from or deferment of any general or specific taxes on products, (b) exemption from or deferment of corporate or local taxation and (c) any special depreciation allowances for tax purposes.

Estimated effect of possible wide fluctuation of any cost factors entering into computations.

Where applicant is producing the same or equivalent products in an existing plant, show present production cost in same general form.

Availability of foreign exchange to permit necessary imports of materials and supplies.

D. Costs of Distributing and Selling

Description of methods of distributing and selling products and estimate of costs thereof.

Costs of advertising.

Administrative expense.

E. Selling Prices

Proposed selling prices in domestic and export markets.

Deduction for cost of selling, distributing and transportation.

Net selling prices at the plant and adjustments that might be made in case of wide fluctuation of any of the cost factors.

F. Profitability

Analysis of predicted Profit & Loss and Forecast of Earnings, Receipts & Expenditures, prepared as per Annex E.

Estimated level of production and sales at break-even point.

Estimate of net annual foreign exchange earnings from exports, if any.

General conclusions as to commercial profitability of the enterprise, including percentage of returns on total investment and on owner's equity.

V. NATIONAL ECONOMIC BENEFITS

List of benefits which will accrue to the economy, in addition to the profits earned by the project owners, such as:

- Taxes paid to the government by the industry and import tariffs included in proposed sale prices of products.
- More effective utilization of labor as compared with other available occupations.
- Provision of a market for local raw materials.
- Foreign exchange gain if products are exported, after taking into account any foreign exchange costs in project operation.
- Benefits to consumers on account of lower prices or more dependable supply of goods.
- Stimulation of other industrial efforts.
- Training of people in factory operation and management.

Evaluation of above and other possible benefits in monetary terms where feasible.

CHAPTER III

ECONOMIC AND TECHNICAL SOUNDNESS ANALYSIS
ELECTRIC POWER PROJECTS

(Projects for construction or expansion of electric generating plants, transmission systems or distribution systems or any combination thereof).

(All topics in this outline should be considered in the Analysis, in so far as they are applicable to the project. Others should be included as necessary to complete the demonstration of the economic and technical soundness of the particular undertaking).

I. SUMMARY

Scope and magnitude of the project and area served.
Location and relation to existing electric facilities, illustrated by a map of the area.
Major features included in project.
Type and source of fuel.
Estimate of cost and return on investment.
Compliance with criteria of Circular A-47, Bureau of the Budget (Annex B).
Reference to any applicable reports (attached or readily available elsewhere).

II. ECONOMIC ASPECTS AND BENEFITS

A. Power Consumption in the Area

Number of present consumers by classification (residential, commercial, industrial, government, railroad, etc.) and power demand and consumption, and past and estimated future rate of growth for each category.
Requested or potential service to large or special consumers.
Forecast of future KW demand and KWH energy requirements by years for 10 years properly related to historical and present demand and energy requirements and supported by appropriate graphs and statistics.
System characteristics such as frequency, phase, voltages, power factor, diversity factors, load factors, plant factors, hours of service per day, seasonal variations, etc.

Typical daily load patterns for annual peak and minimum demand periods.

Reference to power use or market surveys, studies or reports.

B. Present Power System

A brief description of the service area illustrated by maps and diagrams showing present and planned transmission and distribution systems and the location of each power source, major substation, switching point and interconnection with other systems.

A description of the existing facilities which now provide or are able to provide electric power supply, transmission and distribution services in the area, giving capacity, capability and reserves of each system. Include list of plants and major power lines and substations showing ownership, purpose served, condition and age.

Applicable laws, regulations, codes, licenses and franchises, the existence or lack of which may have tended to limit use of new, more efficient equipment or methods, and may affect designs and costs of the proposed project.

Operating problems such as low voltage, insufficient capacity, low reliability, excessive outages and other inadequacies of the present systems.

Current planning in support of or in conflict with the proposed system.

Valuation of facilities and how and when established.

Present indebtedness and losses carried forward.

Adequacy of present rate structures and methods of collection.

Compatibility of existing design, equipment and materials with present U.S. standard equipment and materials.

Descriptions of major units of present systems including at least the following:

1. For each generating plant - state its location, type (steam, diesel or hydro), KW rated capacity (nameplate and capability), type of fuel used, date each principal unit was installed, how the plant is normally used (base load, peaking or standby service), the KWH generated and peak KW demand for each year for 5 past years.

2. For each hydro-electric plant - include also the firm or dependable KW and peaking KW capacity, and the annual KWH energy output broken down into dependable and secondary energy for normal, wet and dry years.

3. For each transmission system - give a description covering design, operating voltage, points connected, length of circuit, type of structures, type, size and spacing of conductors and date system was built.

4. For each substation - give a description covering location, type of structure, number of power transformers, KVA rated capacity and voltages, and type of switching, metering, relaying, capacitors, synchronous condensers, communication facilities, etc.

5. For primary and secondary distribution systems - give a description covering design, consumer densities, voltage levels and regulation, type of circuits (number of conductors, underground, overhead, etc.), materials used for conductors and poles, miles of system, sectionalizing, metering, and sizes and total capacity of distribution transformers.

6. For interconnections with other systems where power is purchased or sold - give data on purpose, KW and KWH transferred, and rates and contract arrangements as applicable.

C. Plan for Meeting Future Requirements

Proposed long-range plan showing how the forecasted power requirement will be met and how the proposed project will fit into this plan and will be integrated with any existing systems, giving consideration to the following:

1. Assignment of the demand (KW) and energy (KWH) requirements to the various power sources (present, proposed and future) so as to obtain the optimum use of all facilities for base load, peaking, off-peak and standby service; give attention to system power and energy losses including generating station service, transformation, transmission and distribution losses, and system reserve requirements.

2. Where hydro-generation is involved - state the estimated output on an average annual water year basis; cover also the method of serving system requirements through a dry year and utilizing excess hydro-energy during periods of maximum flow.

3. The interim system requirements during construction of the proposed facilities.

4. Retirement and disposal of obsolete or obsolescent facilities not needed for standby or peaking service.

Load-duration curves with the output of each power source plotted thereon, accompanied by a description of the means of providing for spinning and standby reserve capacity. (Annex G shows a suggested form for tabulating the results of the load forecast and the plan to meet it).

III. ENGINEERING ASPECTS AND TECHNICAL SOUNDNESS

A. Design

Description of the engineering features of the overall project and the bases on which the project location and design and the type and size of major elements were selected.

Layout and preliminary engineering drawings (attach prints).

Extent of use of existing facilities affected by the project, such as circuit breakers, fuel tanks, etc.

Design and construction standards which will apply, including any local codes, regulations and ordinances which may be applicable.

Information about major project features as follows:

1. Generating stations (all types)
   Description of site.
   Means used to deliver plant output into the power system and to consumers.
   Reports on soil tests for foundations.
   Significant geological meteorological, seismological and lightning data.
   Required site improvements and access to highways, railroads, waterways, etc.

2. Hydro-electric projects
   Selection of proposed site in lieu of possible alternatives.
   Stream runoff records available, period covered, and location of gaging and metorological stations.
   Water rights and present and planned upstream and downstream uses.
   Details of water availability and utilization, including

storage, draw-down and estimated monthly KWH generation under various flow conditions.

Dependable and secondary power output of the project, supported by appropriate analysis.

Geological studies and site borings for dams, tunnels, canals and all major structures.

Basis on which decisions were made as to type and height of dam, size of reservoir, number and size of generating units, capacity of spillway, diversion tunnels, penstocks, gates and other major features of the project.

Capacity-area curve for the reservoir.

The extent and results of studies of reservoir sedimentation and downstream channel effects resulting from project operation.

Required acquisition of land, reservoir clearing, and relocation of roads, railroads, etc.

Design allowances for flood, earthquake and special local conditions.

3. Thermal Plants (steam, diesel, gas turbine, etc.)

Description of the site with suitable drawings showing ground surface contours and location of principal structures.

Detailed information on fuel, including sources, availability, analyses, calorific value, means of delivery and delivered price.

Provisions for fuel storage and handling at the plant.

Estimated heat rate of the plant and the basis on which the estimate was made. (It should be the average that could reasonably be expected based on normal operation of the plant serving its share of the system load).

Heat balance studies.

The source, quality and availability of plant cooling water and boiler make-up water.

Solution of special problems, such as ash and effluent disposal, smoke and fly ash nuisance, and prevention of site flooding.

4. Transmission and distribution systems

Basis on which the design was made, considering power losses (I^2R, corona, etc.), voltage drop allowance, system stability, economic loading, etc., including scope and results of network studies made.

The type of design and material be used for supporting structures, protective treat at of wood structures, average span lengths and conductor size, type and spacing.

One-line diagrams showing proposed system and its relation to the existing system.

Right-of-way requirements covering any problems such as conformance with laws governing condemnation of property, clearing, long overwater spans, etc.

Special measures to overcome effects of deposits on insulators.

Description of the method to be used for sectionalizing and communication.

5. Substations and switching stations

Location and purpose of each station, with KVA and voltages, type of structure (steel, aluminum or wood) and number of circuits.

Type of transformers (tap changing, cooling method, voltages, etc.).

Major circuit breakers and regulating equipment such as capacitors, synchronous condensers and voltage regulators.

Special relaying and metering equipment.

B. Specifications

Outline specifications for equipment and construction defining particularly those standards of quality which will have a significant effect on the cost of construction, with specific justification for any unusual standards adopted to conform with local conditions.

C. Construction Labor, Materials and Equipment

Manpower requirements.

Skilled and unskilled labor and technical and supervisory personnel available.

Local availability of cement, steel, aggregates, poles, cross-arms and other construction materials.

Types of construction equipment required for the work, indicating what is available locally and what must be imported.

D. Special Construction Problems Foreseen

Climatic conditions, especially time and length of wet and dry seasons, as they affect construction schedule and equipment use.
Geological conditions.
Necessity of keeping existing power facilities in service.
Local transport of materials and equipment.
Time required to obtain delivery of imported materials and equipment.

E. Plan for Execution of Project

General construction plan.
Proposed methods of contracting for engineering, construction, and construction supervision (see Chapter I).
Tests to be performed on completed works.
Equipment guarantees to be required.
Engineering and construction schedules (attached).

F. Operating Organization and Quality of Management

Description of organization to be responsible for management, including an organization chart and names and qualifications of key officials.
Required number and qualifications of management and technical employees.
Number, qualifications and availability of required operating employees.
Plans for recruiting and training.
Availability of necessary office facilities and transportation equipment.
Provisions for competent management and maintenance throughout the life of the proposed loan.

G. Overall Technical Soundness

Proven reliability of proposed equipment.
Assurance that proposed system will produce and transmit power at rates stated on a continuing and dependable basis, with full consideration of load factors and plant factors
Analysis of any adverse factors and measures to overcome them.
Steps being taken to secure additional studies or specialized advice if required for final design.

IV. FINANCIAL ASPECTS

A. Estimated Capital Cost

Estimates of cost of land, engineering and construction, prepared in accordance with Annex A so far as applicable. (See also Annex H).

Total estimated capital cost in U.S. dollars and local currency:
- To be financed by Applicant.
- To be financed by loan/grant.

B. Working Capital

Amount required at start-up of plant and at the end of the first, second and third years of operation, to cover supplies, fuel in storage, repair parts, accounts receivable, and cash on hand.

Sources and availability of local and foreign currency funds required.

C. Annual Costs

Estimated cost of power and energy, broken down into production, transmission and distribution for significant years (see suggested form, Annex I), including the first full year's operation following completion and the year when the facility will first be fully utilized, including details of calculation for:
- Operating and maintenance labor, materials and spare parts, supplies, water, lubricants, chemicals, etc.
- Fuel.
- Supervision and administration.
- Taxes, insurance, etc.
- Depreciation charges based on life of various elements.
- Interest on estimated amount of loans.

Where necessary for evaluation purposes - give an additional breakdown to show production cost broken down into its KW capacity and KWH-energy components so that cost may be compared with demand and energy components in rate schedules or to establish the KW capacity value to the system as would be necessary to evaluate the value of peaking capacity.

Portion of the annual cost covering the supplies, spare parts and technical supervision which must be imported together with a statement as to source and availability of the foreign exchange required to cover such imports.

D. Annual Income

Applicable laws and regulations governing the fixing of rate schedules and allowable return on investment (copies attached).

Rate schedules to be adopted, applying to each major class of consumers, with explanation of basis for adoption, taking into account the financial ability of consumers to pay.

Average rate per unit of power and energy sold over the past several years and the estimated average rates for the next 10 years, with recent major changes explained.

Explanation of any anticipated changes in rate schedules.

Estimate of power to be sold during each year of next 10 years. (From Section II above).

Estimated annual gross revenue from power sales.

E. Economic Justification and Profitability of the Project

Proforma balance sheet showing the position of the owner upon completion of the project. (See Annex J).

Financial projection showing the profit and loss and cash flow for each year beginning with the present year and extending through a minimum of 10 years. (See Annex K for a suggested form).

Analysis and comparison of costs of production of power.

Analysis of financial statements to show that revenues will provide an adequate return on the investment and that sufficient funds will be generated to cover all operating costs including interest, taxes and depreciation or amortization of debt (whichever is larger); to make provisions for reserves for replacement and renewal; and to make it possible to finance the costs of expanding the facilities in the service area to meet the future demand.

Comparison of net profit of proposed project with estimated profit of one or more possible alternate plans for meeting power system requirements.

For hydro-electric projects - give a comparison of benefits and costs made in accordance with procedures set forth in Circular A-47 of the Bureau of the Budget. (See Annex B). Where power produced by the project is the only benefit to be considered, the cost of power from the alternative source most likely to be used in the absence of the project normally provides a measure of the power benefits. The ratio should be based on equivalent energy from the hydro and alternative

source delivered to the same load centers by including transmission and transformation losses and costs. The annual costs should include operation, maintenance, interest and depreciation, with depreciation rates commensurate with the estimated economic life of the particular facility. Annex L illustrates a method for showing the results of the benefit-cost analysis. It should be supplemented by detail as may be needed to support the information presented.

V. NATIONAL ECONOMIC BENEFITS

List of benefits which will accrue to the National economy, in addition to the profits earned by the project owners, such as:

- Taxes paid by the industry.
- More effective utilization of labor as compared with other available occupations.
- Provision of a market for local fuels and supplies.
- Benefits to consumers on account of lower prices or more dependable supply of power.
- Stimulation of other industrial efforts.
- Training of people in power operation and management.

Evaluation of above and other possible benefits in monetary terms where feasible and comparison with overall cost to the national economy.

CHAPTER IV

ECONOMIC AND TECHNICAL SOUNDNESS ANALYSIS AGRICULTURE AND IRRIGATION PROJECTS

(Projects for the development or expansion of agricultural land, with or without irrigation).

(All topics in this outline should be considered in the Analysis, in so far as they are applicable to the project. Others should be included as necessary to complete the demonstration of the economic and technical soundness of the particular undertaking).

I. SUMMARY

Location, relation to other agricultural areas, and general plan of project, illustrated by an outline map.
Scope and magnitude of the project, area of new land served and total area benefited.
Major features of proposed development.
Principal crops grown and to be grown.
Estimates of benefits and costs.
Compliance with criteria of Circular A-47, Bureau of the Budget (Annex B).
Reference to any applicable reports (attached or readily available elsewhere).

II. ECONOMIC ASPECTS AND BENEFITS

A. Present Agricultural Production

Crops and acreages by types.
Yields, per acre and total.
Prices received at the farm and total value.
Deductions for farm input costs.
Net agricultural yield.

B. Factors Expected to Increase Production

Changes in farm sizes, tenure status and method of land allocation.
Land and water available for new settlers and improved irrigation service to present farmers.
New crops and modified rotations and cropping patterns.

C. Markets for Additional Crops

Location and size of markets and present and anticipated prices.
Transportation facilities and costs.
Estimated prices obtainable at the farm.

D. Agricultural Production After Completion of Project

Crops and yield.
Value at anticipated prices.
Deductions for farm input costs.
Net agricultural yield.

E. Benefits to Landowners

Gain in total agricultural production.
Annual net benefits to landowners. (See Annex M for suggested form for making calculations).

III. ENGINEERING ASPECTS AND TECHNICAL SOUNDNESS

A. Description of Project Area

Topography of area and description of physical features accompanied by a map showing project area in relation to mountains, rivers, population centers, utilities and transportation facilities.
Climatological data, including records of precipitation, temperature, humidity, evaporation, wind direction and velocities, sunlight hours per month and length of growing season.
Geology of region with particular reference to water bearing formations, movement of ground water, presence of harmful minerals and salts, strength and porosity of foundations for proposed structures and location of suitable construction materials.
Hydrology, including rainfall rates and frequencies, infiltration, runoff, ground water storage and depletion, and losses due to evaporation and transpiration.
Soil surveys, land classification and drainage condition of agricultural area.
Present land use in the project area, covering utilization for various crops, pasture and fallow, existing rotation systems and cropping patterns.

Water usage for various crops and for the area as a whole, quality of irrigation water, existing water rights and customs, laws and regulations concerning water usage.

Local communities and total rural population.

Farm sizes, land tenure systems, farm ownership and farm operating pattern.

Approximate portion of farm production retained on the farms for family subsistence.

Location, capacities and pertinent data on any agricultural processing plants such as sugar mills, natural fibre mills, packing plants, etc.

Availability and cost of agriculture credit both to landlords and tenants.

B. Engineering Surveys, Plans and Data

Preliminary studies made in sufficient detail to permit calculation of work quantities for all elements of project, including the following where applicable:

1. Dams - Most suitable type of dam for location selected, preliminary design, foundation exploration for dam and spillways, spillway size calculations, general features of outlet works, topography of damsite and reservoir basin, tailwater data, capacity-area curves for the reservoir, and location and description of available construction materials, such as earth, sand, gravel and rock.

2. Wells - Location, extent, depth, character and permeability of water-bearing formations, the velocity of underground flow, depth to the natural water surface, drawdown, circle of influence, the types, locations and capacities of wells to be used, and water quality determinations.

3. Canals - Location, design, calculation of quantities, estimates of water losses, need for lining, and plans for handling silt. If also used for water borne transportation describe any special features for traffic use.

4. Structures - Location and preliminary design of diversion structures, intakes, weirs, siphons, flumes, wasteways, drops, checks and chutes, highway and railroad crossings, headgates and water measuring devices, with estimates of types and quantities of materials needed.

5. Drainage - Location, design and calculation of quantities of project drains to receive all waste or surplus water from main canals and laterals and to collect and remove the surface and underground drainage water produced by seepage and deep percolation losses; typical soil profiles to show drainability of soils; and intended use of natural channels as part of drainage system.

6. Land development - Preliminary estimates of land area to be irrigated, land leveling to be done, extent of farm irrigation and drainage systems required, types of irrigation to be used and auxiliary facilities needed such as housing, schools, hospitals, experiment stations, etc.

Estimated seasonal and total crop water needs for each crop to be grown and consequent irrigation delivery requirements, based on a knowledge of local climatic and soil conditions, production objectives, and irrigation water application techniques, taking into account irrigation efficiencies, peak demands, evaporation, effective precipitation and water needed to maintain a favorable salt balance.

C. Plans and Specifications

Preliminary plans for the main elements of the project sufficient to permit a reasonably firm cost estimate to be made, including auxiliary features such as access roads and construction camps and roads. (Attach prints).

Outline specifications defining the proposed standards of quality of construction which will have a major effect on the cost of construction, with specific justification for any standards which are unusual in the local situation.

D. Construction Labor, Materials and Equipment

Manpower requirements and availability of skilled and unskilled labor and technical and supervisory personnel.

Availability of cement, steel, aggregates, and other major construction materials, indicating what is available locally and what must be imported.

Type of work to be done by manual labor.

Types of construction equipment required for the work, indicating what is available locally and what must be imported

14

E. Special Construction Problems Foreseen

Climatic conditions, especially time and length of wet and dry seasons, as they affect construction schedule and equipment use.

Necessity of keeping existing canals, highways and railroads in operation during the construction period.

Possible landslide problems.

Time required to obtain delivery of imports.

F. Management of Completed Project

Name of organization to be responsible for management.

Names and qualifications of key officials, accompanied by an organization chart showing functions performed.

Procedure to be adopted to assure expert management throughout the life of the proposed loan.

Proposed method of assessing and collecting taxes or charges for use of water or facilities.

G. Operation and Maintenance

Description of general method of operation.

Schedule showing progressive development of the project, covering land served and water used annually until project is fully developed.

Availability of necessary trained operating personnel and required facilities and equipment.

Ability to provide the necessary level of maintenance required for new system when completed.

Plan for personnel recruiting and training.

Source of funds to be used for meeting operation and maintenance costs prior to the time the project becomes self-supporting.

Availability of foreign exchange needed for the importation of any operating materials, supplies and spare parts not available locally.

IV. FINANCIAL ASPECTS

A. Estimated Capital Cost

Estimates of cost of land, engineering and construction, prepared in accordance with Annex A so far as applicable.

Total estimated capital cost in U.S. dollar and local currency:
To be financed by Applicant.
To be financed by loan/grant.
Estimated average cost per acre of land benefited.

B. Maintenance and Operation Cost

Annual cost of labor, supervision, equipment operation, operating supplies and repair parts, training expense, administration.
Break-down to show dollar costs and local currency costs.
Annual cost per acre benefited.

C. Estimate of Overall Annual Costs

Annual depreciation and interest on total project investment based on estimated life of project and on the going interest rate for development projects in the country.
Annual operation and maintenance expense.
Total annual cost.
Average annual cost per acre benefited.

D. Estimated Revenues

Total annual benefit to landowners (see Section II above) and average benefit per acre.
Estimate of maximum amount which landowners would be able to pay annually in water charges or land taxes to meet annual cost of project and still retain reasonable profits on their operations.
Proposed schedule of taxes or water charges to be collected from landowners.
Estimated total revenue for each of first 10 years after completion of project.

E. Economic Soundness of Project

1. Benefit-cost ratio, determined in accordance with Circular A-47 of the Bureau of the Budget (Annex B), taking into account:
   Benefits measured by expected net farm income (Section II above).
   Economic cost of the project including operation, maintenance and interest but not depreciation.

2. Ability of project to meet costs, demonstrated by proforma Profit and Loss Statements showing anticipated operating revenues

as against maintenance and operating cost, interest, and depreciation or amortization of debts for ten years after completion of project.

V. NATIONAL ECONOMIC BENEFITS

Overall increase in land values within and surrounding the project.

General increase in business and industry caused by additional crop production.

Increase in general tax receipts.

Gains or savings in foreign exchange, where farm products are exported.

Raising of standard of living in project area.

Direct benefit to population through local expenditures of project funds for labor, materials, food, rent, etc. (temporary benefit).

CHAPTER V

ECONOMIC AND TECHNICAL SOUNDNESS ANALYSIS MINING AND EXTRACTI /E PROJECTS

(Mines of all types and plants for primary extractive processes such as smelting, metal separating, ore up-grading and concentrating, and combinations thereof) .

(All topics in this outline should be considered in the Analysis, in so far as they are applicable to the project. Others should be included as necessary to complete the demonstration of the economic and technical soundness of the particular undertaking) .

I. SUMMARY

Type of mine or plant and proposed daily, monthly and yearly production of all intermediate and final products.

Quantity of indicated ore reserves.

Location of project illustrated by map showing surroundings, transportation facilities, and existing utilities.

Methods of transport and distances involved, from mine or plant to markets, between mine and extractive plants, and to sources of supplies for mining and plant use.

Relation of project to Applicant's present operations, if any, with statement as to Applicant's interest in land, mineral rights, and other natural resources, whether as owner, lessee, or other holder of title.

Benefits, costs and profitability of project.

Reference to any applicable reports (attached or readily available elsewhere).

II. COMMERCIAL ECONOMIC ASPECTS

A. Ore Reserves

Description of known and indicated reserves of the commodity to be exploited, giving measurements, quantities, grades, and sampling and testing methods used, supported by calculations, maps, cross sections, drill hole data, survey, test results and samples.

Statement as to percentage of recovery anticipated with the exploitation method planned.

If underground or open pit mining operations are contemplated, submit relatively complete information as to shape, attitude and grade of the ore body.

B. Market Situation

Local, regional and worldwide market trends during past 5 years, as applicable, for each major product and any competing products, illustrated by a tabulation showing:
Domestic production, quantity and value, f. o. b. mine or plant.
Imports and exports, quantity and value, c. i. f. or f. o. b.
Net local consumption, quantity and value.
Present consumption in country and comparison with other countries.
Any local laws, regulations or customs affecting marketing of proposed products, including import and export duties, tariffs, quotas, restrictions, price controls, subsidies and tax exemptions.

C. Market for Proposed Products

Future market trend for each product showing estimated quantity and value of imports, exports, domestic production, and domestic consumption for the next 5 years.
Trends in use of present or prospective competitive products.
Analysis of market for each product, including c. i. f. and domestic price studies, foreign markets, and distribution costs and methods.
Survey and analysis of all existing or potential users of the several products.
Evidence of salability of the product, in the form of sales contracts or intentions to purchase.
If part of proposed production is intended for export, show for each major product -
Number of units to be exported.
Proposed markets and cost of transport.

D. Applicant's Present Operations, If Any

Nature of present operations and results of operations to date, giving period, amount, quality and method of production.
Present production capacity for each product.

19

Description of existing buildings, equipment, operating organization stage of development, and general condition.

Statement as to whether or not products require further treatment, the nature of such treatment, and the place where such treatment is given.

Complete financial statement including balance sheets, profit and loss statements and dividends paid for past 5 years. (See Annexes C and D. Annual reports are usually acceptable in place of Annex C if reasonably equivalent information is given).

Sales volume and value of each product for past 5 years showing separate figures for domestic and export sales.

Domestic and export prices, f. o. b. mine or plant, for past 5 years.

Estimated production of each major product for next 5 years, with and without completion of project.

Estimated additional production required to meet overall country demand for next 5 years, including intended exports.

E. Competitors

Names, location, present and future output, production costs and selling prices of present local competitors in the same field of production.

Information as to any anticipated changes in competition, such as expansions, modernization, new plants, new competing products, etc.

Information as to foreign competition and any anticipated changes in laws or regulations which might affect volume of imports.

F. Competitive Position

Selling prices which must be met in domestic and export markets.

Estimated transportation costs and export expenses.

Maximum competitive selling prices f. o. b. mine or plant.

Competitive advantages of proposed project.

- Relative availability and cost of labor.
- Modern production equipment and processes.
- Transportation costs.
- Dependability of supply.

G. Summary of Commercial Prospects

Schedule showing forecast of sales volume for the domestic market and each export market, and the percentage of

the total market claimed in each case, with full explanation and justification.

Justification of the proposed size and capacity of the project.

III. ENGINEERING ASPECTS AND TECHNICAL SOUNDNESS

A. Design

Description of the engineering features of the project as a whole.

Reasons for selection of mining method and the extractive or treatment process and comparison with possible alternatives. (Avoid both obsolescent and experimental technology).

Descriptions of particular elements of project as follows:

1. For all mining projects, submit a scale map of Applicant's property or concession, showing boundaries, topography, principal geological features, existing mine workings and structures, ore outcrops, exploratory openings, diamond drill holes, etc.; also submit geologic and engineering reports, assay maps, and other technologic information pertinent to the economic and technical feasibility of the project. (Geologic reports should cover not only the property in question but all aspects of regional geology developed through other investigations and mining operations which might furnish a clue to the origin, nature and extent of mineral deposits in the area).

2. For underground mining, describe the mining method, mine plant and equipment required, the general surface plant, plans for pre-production development, and the planned daily productive capacity.

3. For open pit operations, describe operating procedure and equipment requirements, illustrated by preliminary plans; also describe and justify the overall stripping ratio, the contemplated cut-off grade of the ore, and the planned productive capacity.

4. For ore treatment plant, to be built in conjunction with a mining operation or as an independent enterprise, describe the mill and process, the related facilities, the equipment and proposed daily capacity, illustrated by a plant layout plan and a process flow-sheet.

5. For ore handling and transport[illegible], give complete description of various types of transp[illegible] rail, truck, tramway, barge) to be used between mi[illegible] consumer or port, and a description of structures and equipment required at transfer points, including ports. Also give resume of alternate means considered, and reasons for rejection.

Description of any patents and licenses involved.
Planned arrangements for highway or railroad connections.
Estimated overall output of each product as percentage of design capacity for each of the first 5 years after completion of project.

B. Utilities Available or to be Provided

Requirements, source, availability, cost and reliability of all utilities, pertinent data on each system, and reason for selection of source in each case, including comparison of advantage of purchasing against in-plant production.
Power requirement in peak KW demand and annual KWH consumption, initial and future.
Fuel for heat, steam and plant processes.
Water supply and disposal of effluents (liquid and gaseous), including any which may be noxious or dangerous.

C. Specifications

Outline specifications for equipment and construction defining particularly those standards of quality which will have a significant effect on the cost of construction, with a specific justification for any unusual standards adopted to conform with local conditions.

D. Construction Labor, Materials and Equipment

Manpower requirements and availability, including skilled and unskilled labor, and technical and supervisory personnel.
Local availability of cement, steel, aggregates, and other construction materials.
Types of construction equipment required for the work, indicating what is available locally and what must be imported.

E. Special Construction Problems Foreseen

Climatic conditions, especially time and length of wet and dry

seasons, as they affect construction schedule and equipment use.

Necessity of keeping existing mine or treatment facilities in service.

Time required to obtain delivery of imported materials and equipment.

F. Plan for Execution of Project

General construction plan.

Proposed methods of contracting for engineering, construction and construction supervision (see Chapter I).

Proposed break-down of work into separate contracts.

Tests to be performed on installed equipment.

Equipment guarantees to be required.

Phased engineering and construction schedule (attached).

G. Operating Organization and Quality of Management

Description of organization which will manage the business and supervise its operation illustrated by an organization chart present and projected.

Number, type and availability of labor for each major phase of operation.

Required qualifications of management and technical personnel.

Experience records of available key management and technical personnel.

Plans for recruiting and training.

Provisions for competent management and maintenance throughout the life of the proposed loan.

H. Overall Technical Soundness

Justification of location of project.

Proven reliability of plant processes and equipment.

Superiority of adopted processes.

Compatibility of adopted processes with potential capabilities of available management, operating and maintenance personnel.

Analysis of any adverse factors and measures to overcome them.

Assurance that plant described will produce the quantity and quality of products specified, on a continuing and dependable basis.

IV. FINANCIAL ASPECTS

A. Estimated Capital Cost

Estimates of cost of land, engineering and construction, prepared in accordance with Annex A so far as applicable.

Total estimated capital cost in U. S. dollars and local currency:

To be financed by Applicant.

To be financed by loan/grant.

B. Working Capital Requirements

Amount required at start-up and at the end of the first, second and third years of operation, to cover supplies, repair parts, auxiliary materials, products in process, finished products, accounts receivable and cash on hand.

Sources and availability of local and foreign currency funds required.

Anticipated occurrence of seasonal peaks in working capital requirements and method contemplated to meet such peak financial requirements.

C. Production Cost (broken down into local currency and dollar costs)

Production estimates showing tonnage and grade of run-of-mine ore produced and milled, tonnage and grade of mill products and percentage of mill recovery.

Estimate of the direct cost of producing each of the major products and any intermediate products for mining and milling operations separately, supported by detailed calculations and arranged as per Annex F if applicable.

Estimate of pre-operating cost prorated to production cost.

Adopted wage rates and production factors used in production cost analysis, taking into account legal wage and salary scales, including all fringe benefits such as social security, vacation pay, medical allowances, displacement allowances and travel pay.

Provisions included for personnel facilities such as transportation, housing, subsistence, recreation, medical care, etc.

Number of shifts and days of operation per year used in calculations, and basis for determination.

Governmental preferences or allowances taken into account such as (a) exemption from or deferment of any general or specific

taxes on products, (b) exemption from or deferment of corporate or local taxation, and (c) any special depreciation allowances for tax purposes.

Estimated effect of possible wide fluctuation of any cost factors entering into computations.

Where applicant is producing the same or equivalent products in an existing plant, show present production cost in same general form.

Break-down of production costs into local costs and dollar costs.

Availability of foreign exchange to permit necessary imports of materials and supplies.

D. Costs of Distributing and Selling

Description of methods of distributing and selling products and estimate of costs thereof.

Costs of advertising.

Administrative expense.

E. Selling Prices

Proposed selling prices in domestic and export markets and relationship to current prices.

Deduction for cost of selling, distributing and transportation.

Net selling prices at the plant and adjustments that might be made in case of wide fluctuation of any of the cost factors.

F. Profitability

Analysis of predicted Profit and Loss and Forecast of Earnings. Receipts and Expenditures, as per Annex E.

Estimated level of production and sales at break-even point.

Estimate of net annual foreign exchange earnings from exports, if any.

General conclusion as to commercial profitability of the enterprise, including percentage returns on total investment and on owner's equity.

V. NATIONAL ECONOMIC BENEFITS

List of benefits which will accrue to the National economy, in addition to the profits earned by the project owners, such as:

Taxes paid by the industry and import tariffs included in proposed sale prices of products.

75

More effective utilization of labor as compared with other available occupations.

Provision of a market for local natural resources.

Foreign exchange gain if products are exported, after taking into account any foreign exchange costs in the project operation.

Benefits to consumers on account of lower prices or more dependable supply of goods.

Stimulation of other industrial efforts.

Training of people in factory operation and management.

Evaluation of above and other possible benefits in monetary terms where feasible.

Comparison of benefits with costs.

CHAPTER VI

ECONOMIC AND TECHNICAL SOUNDNESS ANALYSIS
PORT DEVELOPMENT OR STORAGE PROJECTS

(Construction, enlargement or improvement of a sea or inland port or any of the facilities built or operated in connection therewith; or any warehouse, tank or other facility for the storage of commodities; but limited to ports or facilities which offer services to the general public under defined rate schedules).

(All topics in this outline should be considered in the Analysis, in so far as they are applicable to the project. Others should be included as necessary to complete the demonstration of the economic and technical soundness of the particular undertaking).

I. SUMMARY

Location, nature and extent of proposed construction, enlargement or improvement.
Relation to other ports or storage facilities and to Applicant's present operations, if any.
Description of major features of design.
Proposed increase in port or storage capacities.
Estimates of benefits and costs.
Compliance with Circular A-47, Bureau of the Budget (Annex B).
Reference to any applicable reports (attached or readily available elsewhere).

II. ECONOMIC ASPECTS AND BENEFITS

A. Area Served

Description of area to be served, including pertinent information on population, agriculture, natural resources, industries, highways, railroads, and other factors affecting the occurrence or movement of commodities in the area.
Principal commodities produced within the area pertinent to the project.
Types of commodities imported.

B. Present Port and Storage Facilities

Present ports and main storage facilities in the country.
Names of any organizations, agencies, or companies already providing shipping and storage service in the project area.

Description of existing port and storage facilities particularly as to capacity for handling and storing various types of commodities.

Present volume of commodity movements and storage within the project area.

Extent to which inadequacies of port or storage facilities are retarding economic growth.

C. Applicant's Present Operations, If Any

Nature of present operations.

Profit and Loss statements for past 5 years. (See Annex E).

If Applicant is a private corporation, give also financial position and financial information conforming with Annexes C and D so far as applicable.

Present capacity for various services.

Estimated volume of Applicant's business in each type of service for next 5 years, without and with proposed project.

D. Forecast of Future Business

New commodities or new movement patterns expected to develop as a result of the project.

Estimate of volume of new business which would develop as a result of the project.

Forecast of future port and storage services for 10 years after beginning of operation of the project, supported by graphs and rates of increase in demand for such services.

Breakdown of the forecast to show services that would be drawn from existing facilities in the surrounding area and the new services which will be generated by this and any other projects which may be contemplated.

Extent to which forecast has been based on general economic factors other than those disclosed by historical records.

E. Additional Capacity Required

Additional port and storage capacities required to meet the forecast of future traffic by years, taking into account possible expanded services of existing facilities.

Desirable location of additional facilities to meet future requirements.

F. National Program

Description of any national program for development of ports and storage facilities and the specified priority of the project within this program.

G. Character of Anticipated Benefits

Increases in port and storage charges, local custom duties, etc.
Reduction in operating and maintenance costs of any existing facilities.
Increase in general tax receipts which will result from increased economic activity in the area.
Increased income to area served.
Faster and cheaper delivery of commodities.
General economic effect of additional service provided by the proposed project.
Direct benefit to local population through local expenditure of the project funds themselves for labor, materials, food, rent, etc. (temporary benefit).

III. ENGINEERING ASPECTS AND TECHNICAL SOUNDNESS

A. Description and Justification of Project

Basis for selection of the project location and comparison with other sites considered, with reference to both economic and physical aspects.
Description of the engineering features of the project particularly as to type, initial and ultimate capacity, and operating features of any major equipment included.
Special provisions made for handling or storing large volumes of bulk commodities and the justification therefor.
Relationship of capacity of the proposed project to present services and forecasts of future services, taking into account services already being rendered.

B. Design Criteria and Construction Standards

Design objectives, quality and type of service to be rendered.
Standards for materials and equipment to be incorporated in the project.
Outline specifications defining the proposed standards of quality of construction which will have a major effect on the cost of construction, with specific justification for any unusual standards which are proposed to fit local conditions.

C. Surveys and Preliminary Plans

Surveys and studies of project site with pertinent metorological, oceanographical, hydrological, geological data and information as to salinity and presence of wood borers.

Test borings and soundings.

Master plan of the development showing stage construction if contemplated.

Preliminary plans for docks, piers, wharfs, buildings and machinery for handling cargo to, within, through, and from the facility (attach prints).

Preliminary design and layout of railways, roads and utilities serving the facility.

Sketches, diagrams or photographs of existing structures and equipment.

Description of plans for connecting new facilities with existing structures and for operating the combined facility.

D. Construction Labor, Materials and Equipment

Skilled and unskilled labor, including "trainability".

Technical and supervisory personnel.

Major construction materials - cement, aggregates, steel, electrical materials, etc.

Housing, food, fuel, lubricants, repair shops, etc.

Suitable site for construction camp.

Construction equipment.

Local subcontractors.

E. Special Construction Problems Foreseen

Climatic conditions, especially time and length of wet and dry seasons, currents, tides, typhoons, etc., as they affect construction schedule and equipment use and labor force.

Handling of existing port or storage operations during construction.

Limitations on construction schedule due to long-lead-time equipment and materials.

Evaluation of possible major causes of delay - floods, labor troubles, political disturbances, etc.

F. Plan for Execution of Project

General sequence of construction operations, including identification of major elements which control time and cost.

Construction methods, particularly as to the use of manual labor vs. equipment.

Proposed methods of contracting for engineering, construction, and construction supervision (see Chapter I).

Phased engineering and construction schedule (attached).

40

G. Operating Organization

Description of organization which will manage the business or operation, accompanied by an organization chart, present and projected.
Required qualifications of management and technical personnel.
Experience records of available key management and technical personnel.
Plans for recruiting and training.

IV. FINANCIAL ASPECTS

A. Estimated Capital Cost

Estimates of cost of land, engineering and construction, prepared in accordance with Annex A so far as applicable.
Total estimated capital cost in U.S. dollars and local currency:
To be financed by Applicant.
To be financed by loan/grant.

B. Working Capital Requirements

Amount required at start-up and at the end of the first, second and third years of operation, to cover operating supplies, maintenance materials, accounts receivable and cash on hand.
Anticipated occurrence of seasonal peaks in working capital requirements and method contemplated to meet such peaks.

C. Total Initial Capital Requirements

Initial capital cost.
Working capital at start-up of operation.
Total capital requirement by time periods, and type of currency.

D. Maintenance and Operation Cost

Estimate of annual cost of maintenance and operation including labor, supplies, power, fuels, repair parts, supervision and administration, broken down between local currency and foreign currency costs.
Comparison with the maintenance and operation costs of present facilities at the project site or other facilities in the country.

E. Total Annual Cost

Estimates of annual costs, including:
Maintenance and operation.

Depreciation on structures and equipment.
Interest on loans.
Taxes (property, income, etc.).
Total by time periods and type of currency.

Extent to which above estimates have taken into account any governmental preferences, tax remissions, tax deferments or subsidies.

F. Annual Revenues

Estimated annual income from port and dockage fees, handling charges, storage charges, etc., projected for the first 5 years after project completion.

Comparison with present annual revenues of the existing port or storage facility if any, showing the increase brought about by completion of the project.

G. Profitability

Estimate of profit and loss for 5 years after completion of project, conforming generally with Annex E.

Estimated return by years on total capital cost and on owner's investment.

General conclusion as to profitability of the enterprise.

V. COMPARISON OF BENEFITS AND COSTS

Summary of tangible and intangible benefits as described in Section II above, with estimate of monetary value so far as practicable.

Comparison of benefits with costs. (For harbor development portion of project, analysis is to be based on procedures outlined in Circular A-47 of the Bureau of the Budget. See Annex B).

CHAPTER VII

ECONOMIC AND TECHNICAL SOUNDNESS ANALYSIS
AIRPORT PROJECTS

(Construction, enlargement or improvement of an airport).

(All topics in this outline should be considered in the Analysis in so far as they are applicable to the project. Others should be included as necessary to complete the demonstration of the economic and technical soundness of the particular undertaking).

I. SUMMARY

Location, nature and extent of proposed construction, enlargement or improvement.
Relation to other airports and other airway facilities, national and international.
Description of major features of design.
Reference to any applicable reports (attached or readily available elsewhere).
Brief statement of conclusions as to relative benefits and cost.

II. ECONOMIC ASPECTS AND BENEFITS

A. Position of Project in Overall Program

Present airway system in the country.
Present transport systems other than air (rail, highway, water, pipelines, etc.).
Extent to which development of air transport will stimulate economic growth.
National program for airport development, and priority of project within this program.

B. Relation to Other Transport Systems

Present distribution of traffic in the project area among the various types of transport.
Anticipated effect of project on such distribution and on economics of other transport systems.
Relative availability of vehicles, operating personnel, fuel servicing, etc.

Estimated or actual comparable transportation costs for the various systems.

C. Effect on Development in Project Area

General description of area served (physical and economic geography, including agriculture, processing, manufacturing, centers of population, and climate as related to air traffic generating activity).

Estimate of volume of passenger and air freight business which would develop over next 5 years as a result of completion of the project.

D. Anticipated Revenue and Economic Benefits

Operating revenues of existing airport for the past 5 years and forecast of operating revenues for the next 5 years after completion of project.

Increase in general tax receipts which will result from increased economic activity.

Increased foreign exchange earnings through tourism and freight handling.

Increased business income to area served by airport.

Reduction in airline operating and maintenance costs.

Faster and cheaper delivery of perishable or emergency commodities.

Direct benefit to local population through local expenditure of the project funds themselves for labor, materials, food, rent, etc. (temporary benefit).

III. ENGINEERING ASPECTS AND TECHNICAL SOUNDNESS

A. Present and Future Air Traffic

Size, distribution, and economic activities of the area as affecting air traffic.

Population trends.

Type and volume of air passengers and freight arriving at, and departing from, present airport.

New types of air passenger and freight traffic expected to develop as a result of the project.

Summary of present traffic including average and maximum density of landings and take-offs, broken down between military, commercial and general aviation, and maximum size and weight of planes accommodated.

Anticipated traffic for next 5 years, with same break-down as above, with and without the project improvements.

B. Traffic Capacity of Airport

Theoretical capacity of present airport as to number of plane movements, number of passengers, and maximum loads on pavements.

Capacity required for runways and airport facilities to accommodate anticipated plane movements and pavement loadings.

Relation of capacity of proposed facilities to future theoretical requirements.

C. Justification of Proposed Scope of Improvements

Basis for selection of airport site including relation to sources of traffic, suitability of access, and existence of required utilities. Show a comparison with any possible alternatives.

Justification of runway and taxi-way extensions or improvements based on number of plane movements and size and weight of planes to be accommodated.

Necessity of improved airport facilities to accommodate additional passengers and freight traffic.

Necessity for navigational aids and communications and lighting.

D. Design Criteria

Criteria selected for the improved airport (based on those established by the International Civil Aviation Organization (ICAO) or the U.S. Federal Aviation Agency) including particularly the following:

- ICAO runway code letter.
- Runway dimensions, elevation and effective gradient.
- Whether or not instrumental landing system is contemplated.
- Pavement types and the loadings used in design.

Required dimensions of taxi-ways, holding areas, warm-up and terminal aprons, clear zones, end zones, etc.

Criteria for determining whether obstructions should be removed, marked or lighted.

Criteria used for design of required drainage facilities.

Characteristics of fuel storage and refuelling system.

E. Surveys and Preliminary Plans

General description of extent of surveys and preliminary plans and studies used to determine the location of proposed work.

A master plan showing the general layout of the contemplated ultimate development of the airport and indicating various stages, if stage development is contemplated.

A map showing all existing facilities and all work included in the project, including landing strips, runways, taxi-ways, aprons, buildings, utility services, parking areas, access roads, off-site communications, meteorological facilities and a wind rose, as applicable.

Map showing nature and location of obstructions in the approach zones or any penetrations of the horizontal or conical surfaces together with a description of their nature and any work contemplated in removing or marking such obstructions; also a description of the limitations on flight paths imposed by the surroundings; also the drainage pattern for the surrounding area as affecting limitations on future expansion.

Preliminary plans and profiles of new work on runways, taxi-ways and aprons, showing established grades, typical cross-sections, shoulders, and drainage system, in sufficient detail to permit reasonably firm estimates of earthwork and pavement quantities.

Sketches, diagrams, or photographs of typical existing structures, including those for storage and delivery of fuels, and planned modifications or additions in sufficient detail to permit reasonably accurate estimate of their cost.

Sketches or descriptions showing any immediate installation contemplated for instrument landing system or facilities provided to accommodate installation in a later stage of construction.

Details of stabilized or bound shoulders and special treatment of runway ends and parking areas to resist solvents or jet blasts.

Results of soils and sub-surface investigations to determine strength and compaction characteristics of subgrades, position of the ground water level, and foundations for major structures.

Quality and location of available earth and rock contemplated for use in runway, taxi-way and service road construction.

F. Construction Standards

Outline specifications defining the proposed standards of quality

of construction which will have a major effect on the cost of construction with specific justification for any unusual standards which are proposed to fit local conditions.

G. Availability of Local Resources and Equipment

Skilled and unskilled labor, including "trainability".
Technical and supervisory personnel.
Major construction materials - cement, asphalt, aggregates, water, base course materials, steel, pipe, lumber, plumbing, hardware, etc.
Housing, food, fuel and lubricants, repair shops.
Suitable site for construction camp.
Construction equipment.
Local subcontractors.

H. Special Construction Problems Foreseen

Climatic conditions, especially time and length of wet and dry seasons, and periods of daylight, as they affect construction schedule and equipment use and labor force.
Handling of air traffic (if any) during construction.
Limitations on construction schedule due to long-lead-time equipment and materials.
Evaluation of possible major causes of delay - slides, earthquakes, floods, labor troubles, political disturbances, etc.

I. Plan for Execution of Project

General sequence of construction operations, including identification of major elements which control time and cost.
General plan for grading operations as related to equipment requirements, haul distances, requirements for haul and access roads, for quarries and borrow pits, etc.
Construction methods, particularly as to the use of manual labor vs. equipment.
Engineering, construction contracting and construction supervision (see Chapter I).
Phased engineering and construction schedule (attached).

J. Maintenance Organization

Description of Applicant's present and proposed maintenance organization.

Applicant's ability to provide the necessary level of maintenance for new airport facilities when completed.
Availability of equipment and trained maintenance personnel.
Plan for recruiting and training.
Applicant's ability to finance additional maintenance work, and plans for providing funds at proper time.

IV. FINANCIAL ASPECTS

A. Estimated Capital Cost

Estimates of cost of land, engineering and construction, prepared in accordance with Annex A so far as applicable.
Total estimated capital cost in U.S. dollars and local currency:
To be financed by Applicant.
To be financed by loan/grant.

B. Maintenance and Operation Cost

Annual cost of labor, supervision, equipment operation, supplies and spare parts, and administration.
Break-down to show dollar costs and local currency costs.
If funds for training of personnel or purchase of additional maintenance equipment or repair parts are included in the requested loan/grant amount, explain plan in detail.

V. COMPARISON OF BENEFITS AND COST

Summary of tangible and intangible benefits as described in Section II above, with estimate of monetary value so far as practicable.
Annual cost, including interest and amortization of investment and operating and maintenance charges.
Comparison of benefits and costs.

CHAPTER VIII

ECONOMIC AND TECHNICAL SOUNDNESS ANALYSIS TELECOMMUNICATIONS PROJECTS

(Installation, extension or improvement of a system providing message and other services over wire lines, cable, microwave, or radio transmission as normally provided by communications common carriers under defined rate schedules).

(All topics in this outline should be considered in the Analysis in so far as they are applicable to the project. Others should be included as necessary to complete the demonstration of the economic and technical soundness of the particular undertaking).

I. SUMMARY

Location, nature and extent of proposed installation or improvement.
Relation to existing telecommunications systems.
Description of major features of design.
Reference to any applicable reports (attached or available elsewhere).
Brief statement of conclusions as to relative benefits and cost.

II. ECONOMIC ASPECTS AND BENEFITS

A. Position of Project in Overall Program

Present telecommunications systems and identities of owners or operators.
Extent to which inadequacies of communications are retarding economic growth.
National program for telecommunications development, and priority of project within the program.

B. Effect on Development in Project Area

General description of area served (physical and economic geography, including agriculture, processing, manufacturing, centers of population, topography and climate as related to generation of communications traffic).

Estimate of volume of additional communications business which would develop as a result of completion of the project.
General economic effect of improved communications which will result from completion of the project.

C. Applicant's Present Operations, If Any

Nature of present operations.
Profit and loss statements for last 5 years (see Annex E).
If Applicant is a private corporation, give also financial position and financial information conforming with Annexes C and D so far as applicable. (Annual reports are usually acceptable in place of Annex C if reasonably equivalent information is given).
Present capacity for various services.
Estimated volume of business in each type of service for next 5 years, without and with proposed project.

D. Anticipated Revenue and Economic Benefits

Increase in tolls and service charges.
Increase in general tax receipts which will result from increased economic activity.
Increased business income in area served.
Advantages to other planned development projects due to improved communication service.
Direct benefit to local population through local expenditures of the project funds themselves for labor, materials, food, rent, etc. (temporary benefit).

III. ENGINEERING ASPECTS AND TECHNICAL SOUNDNESS

A. Present and Future Traffic Trends

Size, distribution, and economic activities of the population.
Population trends.
Nature and relative number of various types of communications.
New types of communications expected to develop as a result of project.

B. Estimated Market

Types of surveys conducted in the service area.
Forecast of market by category of user and type of service for each communications center or other defined area, and for

each inter-area connection for a 10-year period, supported by graphs and statistics as to rate of growth of demand.

Relationship of forecast to historical use in the area and known new demands.

Comparisons with usage in similar areas elsewhere.

Consideration given to large users and special service installations.

Extent to which forecast has been based on general economic factors not disclosed by historical data.

C. Existing Telecommunications in the Area

Description of present organizations rendering telecommunications service.

Map showing system boundaries, license or franchise limitations, major communications centers and connections between them.

Description of existing facilities including types of switching, wire line, radio and terminal equipment for the various services provided, points between which such services are provided, and age, condition and adequacy of the facilities.

Tabulation showing pattern of development for the past 5 years by type of service, category of user, residential, industrial, commercial, governmental, institutional, and annual usage in each case.

D. Justification of Proposed Scope of Improvements

Description of the major elements of the project as to type, initial and ultimate capacity, and operating features of major equipment.

Basis for selection of the particular layout and proposed equipment.

Relationship of capacities of the proposed or enlarged system with present usage and forecast of future usage.

Necessity of the new or additional facilities.

E. Design Criteria and Standards

Design objectives for quality and grade of service including transmission objectives.

Standards for materials and equipment to be incorporated in the Project.

Technical limitations on location.

Applicable laws and regulations governing frequencies.

Types of construction, etc.
Special characteristics and availability of power required.

F. Surveys and Preliminary Plans

Map of the system layout showing connections with existing systems owned by the Applicant or others.
Schematic drawings showing number and types of circuits (open wire, cable, carrier, radio) and switching arrangements.
Comparison of project with alternate methods of providing the proposed service.
Field investigations such as path surveys, loss calculations, and field intensity measurements for radio equipment.
Compatibility of proposed equipment with existing equipment to be retained.
Diagrams showing frequency allocation and channeling for radio and carrier equipment and coordination with other similar equipment in operation or planned in the area.
Summary of arrangements made for circuits terminating outside the project area such as international circuits.
Description of method of operating present and proposed facilities within the area in such manner as to meet system requirements determined by the market forecast.

G. Construction Labor, Materials and Equipment

Skilled and unskilled labor, including "trainability".
Technical and supervisory personnel.
Major construction materials - cement, aggregates, steel, poles, wire, electrical materials, etc.
Housing, food, fuel and lubricants, repair shops.
Suitable sites for construction camps.
Construction equipment.
Local subcontractors.

H. Special Construction Problems Foreseen

Climatic conditions, especially time and length of wet and dry seasons, as they effect construction schedule and equipment use and labor force.
Handling of existing communications operations during construction of new facilities.
Limitations on construction schedule due to long-lead-time equipment and materials.

Evaluation of possible major causes of delay - floods, labor troubles, political disturbances, etc.

I. Plan for Execution of Project

General sequence of construction operations, including identification of major elements which control time and cost.
Plan for receiving, storing and distributing materials and equipment to points of use.
Construction methods, particularly as to the use of manual labor vs. equipment.
Proposed method of contracting for engineering, construction and construction supervision (see Chapter I).
Requirements for equipment and system tests.
Phased engineering and construction schedule (attached).

J. Maintenance Organization

Description of Applicant's present and proposed maintenance organization.
Applicant's ability to provide the necessary level of maintenance for communications system when completed.
Availability of equipment and trained maintenance personnel.
Plan for recruiting and training.
Applicant's ability to finance additional maintenance work, and plans for providing funds at proper time.
If funds for training of personnel or purchase of additional maintenance equipment or spare parts are included in the requested loan amount, explain plan in detail.

IV. FINANCIAL ASPECTS

A. Estimated Capital Cost

Estimates of cost of land, engineering and construction, prepared in accordance with Annex A so far as applicable.
Total estimated capital cost in U.S. dollars and local currency:
To be financed by Applicant.
To be financed by loan/grant.

B. Working Capital Requirements

Amount required at end of construction period and at the end of the first, second and third years of operation, to cover operating

supplies, maintenance materials, accounts receivable and cash on hand.

Anticipated occurrence of peaks in working capital requirements and method contemplated to meet such peaks.

C. Maintenance and Operation Cost

Annual cost of labor, supervision, equipment operation, operating supplies and repair parts, and administration.

Break-down to show dollar costs and local currency costs.

If funds for training of personnel or purchase of additional maintenance equipment or repair parts are included in the requested loan/grant amount, explain plan in detail.

D. Annual Income

Schedule of rates adopted for various types of communications services and basis for determination.

Explanation of any changes in rates from present schedule and any prospective future changes.

Income based on forecast of market for each year of next 10 year period (Section III above).

E. Profitability

Analysis of predicted Profit and Loss and Forecast of Earnings Receipts and Expenditures, prepared as per Annex E.

General conclusion as to commercial profitability of the enterprise, including percentage of return on total investment and on owner's equity.

V. NATIONAL ECONOMIC BENEFITS

Net annual profit of the enterprise.

Other tangible and intangible benefits to the economy (Chapter II), evaluated in monetary terms so far as practicable.

Overall value of project benefits.

Comparison with costs of the project, including any costs or losses on the part of the government.

CHAPTER IX

ECONOMIC AND TECHNICAL SOUNDNESS ANALYSIS
HIGHWAY PROJECTS

(Construction, reconstruction, widening or improvement of a highway or any of its component parts such as bridges, tunnels, culverts, pavements and miscellaneous structures and facilities).

(All topics in this outline should be considered in the Analysis, in so far as they are applicable to the project. Others should be included as necessary to complete the demonstration of the economic and technical soundness of the particular undertaking).

I. SUMMARY

Location, nature and extent of proposed construction or improvement.
Relation to other highways and other transportation facilities.
Description of major features of design.
Reference to any applicable reports (attached or readily available elsewhere).

II. ECONOMIC ASPECTS AND BENEFITS

A. Position of Project in Overall Program

Present highway system.
Present transport systems other than highway (rail, air, water, pipelines, etc.).
Extent to which inadequacies of transport are retarding economic growth.
National program for highway development and priority of project within the program.

B. Relation to Other Transport Systems

Present distribution of traffic among the various types of transport in the project area.
Anticipated effect of project on such distribution and on economics of other transport systems.
Relative availability of vehicles, operating personnel, fuel, servicing, etc.
Estimated or actual comparable transportation costs for the various systems.

C. Effect on Development in Project Area

General description of area served (physical and economic geography, including agriculture, processing, manufacturing, centers of population, topography, geology, vegetative cover, and climate as related to traffic generating economic activity).

Estimate of volume of exportable surpluses of commodities available in the area and requiring transport to outside markets.

General economic effect of additional commerce anticipated as a result of proposed project.

D. Anticipated Economic Benefits

Increase in special tax receipts (gasoline, road and bridge tolls, local custom duties, etc.).

Increase in general tax receipts which will result from increased economic activity.

Reduction in transportation costs, including vehicle operating and maintenance costs.

Increased income to area served.

Lower costs of other planned development projects which will be served by this project.

Gains by opening new land for settlement by outside population presently unemployed or under-employed.

Direct benefit to local population through local expenditure of the project funds themselves for labor, materials, food, rent, etc. (temporary benefit).

III. ENGINEERING ASPECTS AND TECHNICAL SOUNDNESS

A. Present and Future Traffic Generating Activities

Size, distribution, and economic activities of the population.

Nature and tonnages of cargo imported into, exported from and passing through the area.

Schools.

Population trends.

New types and amounts of traffic expected to develop as a result of project.

Projections of present traffic without and with proposed project.

B. Traffic Capacities

Theoretical capacity of present highway (number of vehicles, tonnage and maximum loads).

Present use of highway (based on traffic counts or other means of estimating).

Estimated future use projected to end of proposed loan period.
Relation of present and estimated future use to present and future theoretical capabilities.

C. Justification of the Scope of Improvement

On basis of maximum load and traffic volume requirements.
On basis of general development of the country.

D. Design Criteria

Traffic density, maximum load and anticipated speeds.
Ruling grades, radius of curvature, and sight distances.
Number of traffic lanes, and by-passes and turn-outs, if any.
Widths of roadway, shoulders, and clearing.
Maximum height of embankments (to limit length of culverts and width of clearing).
Criteria used to determine types of stream crossings (pipe culverts, box culverts, masonry-arch bridges, steel bridges, etc.).

E. Surveys and Preliminary Plans

Description of extent of preliminary studies and surveys used to arrive at proposed location.
Preliminary alignment map of proposed location based on ground surveys, aerial surveys, topographic maps and other sources.
Preliminary plan-profile drawings with established grades, typical cross-sections and general drainage schemes, sufficient to permit reasonably firm estimates of earth work quantities and haul distances.
Rainfall and runoff data and calculations of stream-flow estimates, sufficient to permit rational design of drainage structures.
Sketches, diagrams or photographs of typical existing drainage works, tunnels, bridges, retaining walls and other significant structures.
Location sketches for major new structures.
Preliminary plans for modification of existing structures and for construction of typical new structures, culverts, drainage ditches, etc., in sufficient detail to permit reasonably close estimate of materials and work quantities.
Preliminary schedule of drainage structures by type, giving approximate numbers and total length of each type and size.
Preliminary plans of any major safety features, such as median dividers, grade separations, interchanges, etc.
Results of soils and subsurface investigations for determination of quality of foundations for fills and major structures and for location of quarries and borrow pits.

F. Construction Standards

Outline specifications defining the proposed standards of quality of construction, which will have a major effect on the cost of construction (specific justification for any unusual standards which are adopted to fit the local situation and conform with local standards.

G. Availability of Local Resources and Equipment

Skilled and unskilled labor, including "trainability".
Technical and supervisory personnel.
Major construction materials - cement, aggregates, water, base course materials, steel, pipe.
Housing, food, fuel and lubricants, repair shops, etc.
Suitable sites for construction yards or camps.
Construction equipment.
Local subcontractors.

H. Special Construction Problems Foreseen

Climatic conditions, especially time and length of wet and dry seasons and periods of daylight, as they affect construction schedule and equipment use and labor force.
Rerouting of traffic during construction.
Limitations on construction schedule due to long-lead-time equipment and materials.
Evaluation of possible major causes of delay - slides, earthquakes, floods, labor troubles, political disturbances, etc.

I. Plan for Execution of Project

General sequence of construction operations, including identification of major elements which control time and cost.
General plans for grading operations as related to equipment requirements, haul distances, requirements for haul roads and access roads to quarries and borrow pits, etc.
Description of base course and paving operations.
Construction methods, particularly as to the use of manual labor vs. equipment.
Proposed methods of contracting for engineering, construction and construction supervision (see Chapter I).
Phased engineering and construction schedule (attached).

J. Maintenance Organization

Description of Applicant's present and proposed maintenance organization.

Applicant's ability to provide the necessary level of maintenance for new highway when completed.
Availability of equipment and trained maintenance personnel.
Plan for recruiting and training.
Applicant's ability to finance additional maintenance work, and plans for providing funds at proper time.

IV. FINANCIAL ASPECTS

A. Estimated Capital Cost

Estimates of cost of land, engineering and construction, prepared in accordance with Annex A so far as applicable.
Total estimated capital cost in U. S. dollars and local currency to be financed by Applicant.

B. Maintenance and Operation Cost

Annual cost of labor, supervision, equipment operation, operating supplies and repair parts and administration.
Breakdown to show dollar costs and local currency costs.
If funds for training of personnel or purchase of additional maintenance equipment or repair parts are included in the requested loan/grant amount, explain plan in detail.

V. COMPARISON OF BENEFITS AND COST

Summary of tangible and intangible benefits as described in Section II above, with estimate of monetary value so far as practicable.
Annual cost including interest and amortization on investment and operating and maintenance charges.
Comparison of benefits with costs.

CHAPTER X

ECONOMIC AND TECHNICAL SOUNDNESS ANALYSIS
MUNICIPAL STREET AND STORM SEWER PROJECTS

(Construction or improvement of public streets within a city, town or village with or without concurrent installation of gutters, catch basins, storm water inlets, and storm sewers).

(All topics in this outline should be considered in the Analysis, in so far as they are applicable to the project. Others should be included as necessary to complete the demonstration of the economic and technical soundness of the particular undertaking).

I. SUMMARY

Location, nature and extent of proposed construction or improvement.
Relation to work previously done.
Description of major features of work.
Reference to any applicable reports (attached or readily available elsewhere).
Brief statement of conclusions as to relative benefits and cost.

II. ECONOMIC ASPECTS AND BENEFITS

A. Position of Project in Overall Program

Present extent and condition of street system, including percentage paved, and extent of storm sewer system.
Extent to which inadequacies of streets and storm sewers are retarding economic growth of the community.
Adopted program for development of a municipal street and drainage system and priority of project within this program.

B. Present Storm Sewer System

Extent of storm sewer system.
Area served and present capacity and adequacy.
Types of pipe and present condition.
Existence and adequacy of any pumping plants.
Conditions at present outfall.
Extent to which storm sewers are used for sanitary sewage.
Complaints received about flooding.

C. Effect of Improvement on Development in Project Area

General description of area including occupations, industries, processing and manufacturing plants, topography, and climate as related to traffic generating activity.
Estimate of volume of new local business or residential housing which would develop as a result of completion of the project.
General economic effect of improved traffic circulation provided by the proposed project.

D. Evaluation of Anticipated Benefits

Increase in general tax receipts which will result from increased property values and general economic activity in the community.
Reduction in street maintenance and flood control cost.
Saving in cost of vehicle operation.
More efficient movement of people and commodities.
Direct benefit to local population through local expenditures of the project funds themselves for labor, materials, food, rent, etc. (temporary benefit).

III. ENGINEERING ASPECTS AND TECHNICAL SOUNDNESS

A. Present and Future Traffic Generating Factors

Forecast of population growth and basis of prediction.
Contemplated changes in zoning or land use.
Anticipated industrial, commercial and residential growth.

B. Traffic Capacities

Theoretical capacity of present streets (number of lanes and maximum loads).
Present use of streets (based on traffic counts or other means of estimating) and estimated future use.

C. Justification of Scope of Proposed Project

Need of project in relation to traffic requirements and prevention of flooding.
Relation to development of the community.

D. Design Criteria

Maximum grade, and minimum radius of curvature.
Number of traffic lanes and maximum loads.
Widths of roadways and walkways.
Criteria used to determine flow capacities of gutters, culverts, storm sewers and bridges.

E. Construction Standards

Outline specifications defining the proposed standards of quality of construction which will have a major effect on the cost of construction (specific justification to be given for any unusual standards which are adopted to fit the local situation or to conform with present standards).

F. Surveys and Preliminary Plans Furnished

General location map and master plan for street development.
Preliminary street plan showing proposed work.
Land and easement acquisition.
Plan for clearing right-of-way and removing existing buildings.
Preliminary plan-profile drawings with established grades, typical cross-sections, location of present and proposed sewers and utility lines in sufficient detail to permit reasonably firm estimates of earth work and pavement and storm sewer work quantities.
Rainfall and runoff data and calculation of flows sufficient to permit rational design of storm sewer and drainage facilities.
Sketches, diagrams or photographs of typical existing storm sewers, culverts, bridges, retaining walls and other significant structures.
Location sketches for major new structures.
Preliminary plans for modification of existing structures and for construction of typical new structures, storm sewers, culverts, drainage ditches, pumping plants, etc. - in sufficient detail to permit a reasonably close estimate of materials and work quantities.
Preliminary schedule of sewer pipe and sewer and drainage structures, giving approximate numbers and lengths by type and size.
Results of soils and subsurface investigations for determination of quality of foundations for pavements and major structures and character of material in pipe trenches.

Description of conditions at outfall and any measures required to prevent backwater, and downstream damage.

G. Construction Labor, Materials and Equipment

Skilled and unskilled labor, including "trainability".
Technical and supervisory personnel.
Major construction materials - cement, asphalt, aggregates, water, base course material, structural and reinforcing steel, culvert pipe, sewer pipe, castings, etc.
Housing, food, fuel and lubricants, repair shops.
Suitable sites for construction yard.
Construction equipment.
Local subcontractors.

H. Special Construction Problems Foreseen

Climatic conditions, especially time and length of wet and dry seasons and prevalence of rain, snow and ice as they affect construction schedule and equipment use and labor force.
Rerouting of traffic during construction.
Limitations on construction schedule due to long-lead-time equipment and materials.
Evaluation of possible major causes of delay - floods, labor troubles, political disturbances, lack of right-of-way, delay in installation of utilities by others, etc.

I. Plan for Execution of Project

General sequence of construction operations, including identification of major elements which control time and cost.
General nature of grading and trenching operations as related to equipment requirements and haul distances.
Construction methods, particularly as to the use of manual labor vs. equipment.
Proposed methods of contracting for engineering, construction, and construction supervision (see Chapter I).
Phased engineering and construction schedule showing timing and duration of major work items.

J. Maintenance Organization

Description of Applicant's present and proposed maintenance organization.

Applicant's ability to provide the necessary level of maintenance for new streets and sewers when completed.
Availability of equipment and trained maintenance personnel.
Plan for recruiting and training.
Applicant's ability to finance additional maintenance work, and plans for providing funds at proper time.
If funds for training of personnel or purchase of additional maintenance equipment or spare parts are included in the requested loan/grant amount, explain plan in detail.

IV. FINANCIAL ASPECTS

A. Estimated Capital Cost

Estimate of cost of land, engineering and construction, prepared in accordance with Annex A so far as applicable.
Total estimated capital cost in U.S. dollars and local currency:
To be financed by Applicant.
To be financed by loan/grant.

B. Annual Maintenance Cost

Annual cost of labor, supervision, equipment operation, supplies and spare parts, and administration.
Break-down to show dollar costs and local currency costs.
If funds for training of personnel or purchase of additional maintenance equipment or spare parts are included in the requested loan/grant amount, explain plan in detail.

V. COMPARISON OF BENEFITS AND COSTS

Summary of tangible and intangible benefits as described in Section II above, with estimate of monetary value so far as practicable.
Annual cost including interest and amortization of investment and operating and maintenance charges.
Comparison of benefits with costs.

CHAPTER XI

ECONOMIC AND TECHNICAL SOUNDNESS ANALYSIS MUNICIPAL WATER AND SEWERAGE PROJECTS

(Construction, extension or improvement of water supply and distribution systems, sanitary sewer systems, water treatment plants, sewage treatment plants and any combinations thereof).

(All topics in this outline should be considered in the Analysis, in so far as they are applicable to the project. Others should be included as necessary to complete the demonstration of the economic and technical soundness of the particular undertaking).

I. SUMMARY

Location, nature and extent of proposed construction or improvement.
Relation to existing water and sewer systems in the community.
Description of major features of design.
Estimates of benefits and costs.
Compliance with criteria of Circular A-47, Bureau of the Budget (Annex B).
Reference to any applicable reports (attached or readily available elsewhere).

II. ECONOMIC ASPECTS AND BENEFITS

A. Description of the Community

Geography, topography, type of soil, seismic activity and climate.
Population and principal occupations.
Number of industries by type.
Prevalence of water borne diseases.

B. Present Water System

Extent of water system and area and population served.
If more than one, give area served by each and type of water delivered (potable, industrial, fire-fighting, etc.).
Sources of supply and description of existing wells, dams, pumps and conduits.

Quality of water and amount of dependable supply.
Description and condition of any treatment facilities.
Main features of distribution system including tanks, reservoirs, pumping plants and types of pipe.
Adequacy of service within area supplied.
Application or demand for increased or improved service.

C. Present Sanitary Sewer System

Extent of sewer system and area and population served.
Local customs and usage, as they affect amount and nature of sewage.
Number of house connections and relation to the number of water services.
Types of pipe and present condition.
Extent to which parts of the sanitary system are used also to carry storm drainage.
Description of any sewage treatment facilities.
Location and adequacy of effluent disposal areas.
Methods used to dispose of sewage in areas not served by the sewer system.
Complaints about sanitary sewage overflow.

D. Position of Project in Overall Program

Extent to which inadequacies of the water and sewer systems constitute a health menace and tend to retard the economic growth of the community.
National or regional program for development of water and sewer systems and priority of project within this program.

E. Anticipated Benefits

Increase in revenues from water and sewer charges.
Reduction or elimination of present costs of obtaining water and sewage service.
Estimate of volume of new local business and new residential construction which would develop as a result of completion of of the project.
General economic effect of improved water supply and sewerage.
Increase in general tax receipts which will result from increased property values and increase in general economic activity in the community.

Lower insurance rates resulting from improved facilities for fire suppression.
Removal of health hazards and saving in cost of health services.
Direct benefit to local population through local expenditures of the project funds themselves for labor, materials, food, rent, etc. (temporary benefit).

III. ENGINEERING ASPECTS AND TECHNICAL SOUNDNESS

A. Factors Affecting Water Supply and Sewerage Requirements

Size, distribution and economic activities of the population.
Forecast of population growth, giving basis of prediction.
Contemplated changes in zoning or land use.
Demand for additional home building.
Anticipated industrial or commercial development.

B. Capacities of Water and Sewer Systems

Present and anticipated water consumption per capita and comparisons with other similar communities.
Total water supply and number of water services required to serve the community.
Total volume of sanitary sewage to be disposed of and comparison with supply of water.

C. Justification of Scope of Project

Desirability of construction by stages.
Areas to be served by initial stage.
Capacities to be provided in relation to theoretical or ultimate requirements.
Scope of project in relation to development of the community.

D. Design Criteria

Reliability of water supply.
Initial capacity of water mains in relation to estimated future requirements.
Maximum and minimum water pressures at service connections.
Degree of water purification required for a potable supply or an industrial supply.
Minimum velocity in sanitary sewers.
Minimum size of sewers.

Permissibility of using sanitary sewers for storm flow.
Degree of sewage treatment required.

E. Construction Standards

Outline specifications defining the proposed standards of quality of construction which will have a major effect on the cost of construction (specific justification to be given for any unusual standards which are adopted to fit the local situation or to conform with present standards).

F. Preliminary Studies and Plans

Location map showing contours, sources of water supply, main conduits, boundaries of the community, service areas in first stage of development, location of water and sewage treatment plants, and outfall for sewage effluent.
Rainfall and runoff data and calculation of flows sufficient to demonstrate sufficiency of water supply.
Results of soils and subsurface investigations for determination of quality of foundations for major structures and character of material in pipe trenches.
Information about major elements of the project as follows:

1. Water supply and treatment
   Sources of supply (lake, river, fresh or brackish wells, reclaimed water).
   Preliminary plans of dams, intakes, pumping plants, well fields and conduits (attach prints).
   Preliminary layout of water treatment or desalinization plant, flow diagram and preliminary plans of major features (attach prints).

2. Water distribution system
   Street plan showing location and sizes of water mains and laterals, and location and capacity of reservoirs, storage tanks and booster pumping stations.
   Determination as to separate systems for potable and non-potable water or a single system for all uses.
   Basis for determination of capacities.
   Calculations of pressures at faucets, hydrants, etc.
   Explanation of provisions for expansion or extension of the system in later stages of development.
   Inclusion of water meters in project.

Schedule of pipe sizes and quantities.
Preliminary typical plans for structures.

3. Sewage collection and treatment

Street plan showing location and sizes of collection, intercepting and main sewers and location of sewage treatment plant.
Type of system (separate or combined sanitary and storm).
Basis for determination of sewer sizes.
Explanation of provisions for future expansion and extension.
Schedule of sewer pipe sizes and quantities and number of manholes.
Preliminary typical plans for structures in collection system.
Basis for selection of treatment plant site.
Preliminary layout of sewage treatment plant, flow diagram and preliminary plans of major features.
Description of stream or body of water which will receive effluent and its capability of accepting the quantity and quality of flow to be discharged.

G. Construction Labor, Materials and Equipment

Skilled and unskilled labor, including "trainability".
Technical and supervisory personnel.
Major construction materials - water and sewer pipe, cement, aggregates, water for concrete, structural and reinforcing steel, castings, etc.
Housing, food, fuel and lubricants, repair shops.
Suitable sites for construction yards or camps.
Construction equipment.
Local subcontractors.

H. Special Construction Problems Foreseen

Climatic conditions, especially time and length of wet and dry seasons, floods, and temperatures as they affect construction schedule and equipment use and labor force.
Soil conditions and ground water.
Rerouting of street traffic during construction.
Limitations on construction schedule due to long-lead-time equipment and materials.

Evaluation of possible major causes of delay - floods, labor troubles, lack of right-of-way, etc.

I. Plan for Execution of Project

General sequence of construction operations, including identification of major elements which control time and cost.
Construction methods, particularly as to the use of manual labor vs. equipment.
Proposed methods of contracting for engineering, construction, and construction supervision. (See Chapter I).
Phased engineering and construction schedule (attached).

J. Maintenance and Operating Organization

Description of Applicant's present and proposed maintenance and operating organization.
Applicant's ability to provide the necessary level of maintenance for new water and sewer systems when completed.
Availability of trained maintenance and operating personnel and equipment.
Applicant's ability to finance additional maintenance and operation work, and plans for providing funds at proper time.
If funds for training of personnel or purchase of additional maintenance equipment or spare parts are included in the requested loan/grant amount, explain plan in detail.

IV. FINANCIAL ASPECTS

A. Estimated Capital Cost

Estimates of cost of land, engineering and construction, prepared in accordance with Annex A so far as applicable.
Total estimated capital cost in U.S. dollars and local currency:
To be financed by Applicant.
To be financed by loan/grant.

B. Maintenance and Operation Cost

Estimate of annual cost of maintenance and operation including labor, supplies, power, spare parts, supervision and administration, broken down between local currency and foreign currency costs.

Comparison with the maintenance and operation costs of present community facilities or similar facilities elsewhere.

C. Estimated Revenues

Proposed schedule of water rates for domestic and industrial use or special taxes on land served.

Proposed schedule of charges for sewage disposal service based on water use or quantity of effluent.

Estimates of annual income for first 10 years based on forecast of water consumption at proposed rates and charges.

V. COMPARISON OF BENEFITS AND COST

Tangible and intangible benefits as described in Section II above, with estimate of monetary value so far as practicable, compared with annual cost, including interest and amortization of investment and operating and maintenance charges.

Ability of project to meet costs, demonstrated by proforma Profit and Loss statements showing anticipated revenues as against maintenance and operating cost, interest, and depreciation or amortization of debts for 10 years after completion of project.

For water supply systems - compute benefit-cost ratio, determined in accordance with Circular A-47 of the Bureau of the Budget (Annex B), taking into account:

- Benefits measured by income collected, savings in present cost of sewage disposal, reduction in health service costs, etc.
- Economic cost of the project including operation, maintenance and interest but not depreciation.

CHAPTER XII

ECONOMIC AND TECHNICAL SOUNDNESS ANALYSIS
RAILROAD PROJECTS

(Construction, reconstruction, rehabilitation or extension of a railroad or of track, structures, buildings or other elements of a railroad; also the furnishing of rails, rolling stock, or signal and communications or other equipment for use on a railroad).

(All topics in this outline should be considered in the Analysis, in so far as they are applicable to the project. Others should be included as necessary to complete the demonstration of the economic and technical soundness of the particular undertaking).

I. SUMMARY

Location, nature and extent of proposed project.
Relation to Applicant's present business and to other railroads and other transportation facilities.
Description of major features of design.
Reference to any applicable reports (attached or readily available).
Brief statement of conclusions as to benefits and costs.

II. ECONOMIC ASPECTS AND BENEFITS

A. Area Served

Description of area to be served, including pertinent information on population, agriculture, natural resources, industries, towns and cities, and other factors affecting the occurrence or movement of commodities and the movement of people in the area.
Principal commodities produced within the area for distribution or export.
Types of commodities imported and distributed.

B. Position of Project in Overall Program

Present railway system.
Present transport systems other than rail (highway, air, water, pipelines, etc.).

Extent to which inadequacies of transport are retarding economic growth.

National or regional program for railway development and priority of project within the program.

C. Relation to Other Transport Systems

Present distribution of traffic among the various types of transport in the project area.

Anticipated effect of project on such distribution and on economics of other transport systems.

Relative availability of vehicles, operating personnel, fuel, servicing, etc.

Estimated or actual comparable transportation costs for the various systems.

D. Applicant's Present Operations, If Any

Nature and extent of present operations.

Description of existing facilities.

Profit and Loss statements for past 5 years. (See Annex C).

If Applicant is a private corporation, give also financial position and financial information conforming with Annexes C and D so far as applicable. (Annual reports are usually acceptable in place of Annex C if reasonably equivalent information is given).

E. Forecast of Future Business

New commodities or new movement patterns expected to develop as a result of the project or as a result of other developments in the country.

Forecast of future freight and passenger business for at least 10 years after completion of the project, supported by graphs and statistics and giving justification for the assumptions made as to rates of increase in growth.

Break-down of the forecast to show business that would be drawn from highways or other railways in the surrounding area and the new business which will be generated by this and any other projects which may be contemplated.

Extent to which forecast has been based on general economic factors other than those disclosed by historical records.

F. Character of Anticipated Benefits

Reduction in operating and maintenance costs of existing railway.
Faster and cheaper delivery of commodities.
Reduction in transportation costs to users.
General economic effect of improved service provided by the proposed project.
Increased income to area served.
Increase in general tax receipts which will result from increased economic activity in the area.
Lower costs of other planned development projects which will be served by this project.
Gains by opening new land for settlement by outside population presently unemployed or under-employed.
Direct benefit to local population through local expenditure of the project funds themselves for labor, materials, food, rent, etc. (temporary benefit).

III. ENGINEERING ASPECTS AND TECHNICAL SOUNDNESS

A. Description and Justification of Project Location

Description of the engineering features of the project.
Basis for selection of the project location and comparison with other locations considered, with reference to both economic and physical aspects.

B. Traffic Capacities

Factors limiting capacity of present railway (rolling stock, ruling grades, curves, tunnels, repair facilities, etc.).
Additional railway capacity required to meet the forecast of future traffic by years, taking into account possible expanded services of existing railways and air lines and possible construction of highways, waterways and pipe lines.
Capacity of railway after completion of proposed project.

C. Justification of the Scope of Project

On basis of relation to estimated future requirements.
On basis of general development of the country.

D. Design Criteria

Maximum train loads, maximum and average speeds.

Ruling grades and curvature.
Number of tracks, frequency of passing tracks, turn-around time.
Weight of rail, bolted or welded.
Type of ties and quality and size of ballast.
Criteria used to determine types of stream crossings (pipe or box culverts, masonry-arch or steel bridges, etc.).
Servicing facilities.
Signal requirements.
Housing for operating personnel.

E. Surveys and Preliminary Plans

Description of extent of preliminary studies and surveys used to arrive at proposed location.
Preliminary alignment map of proposed location based on ground surveys, aerial surveys, topographic maps and other sources.
Preliminary profile drawings with established grades, location of principal bridges, typical roadbed-sections and general drainage schemes, sufficient to permit reasonably firm estimates of earthwork quantities and haul distances.
Rainfall and runoff data and estimates of stream-flow sufficient to permit a reasonable estimate of bridge and culvert quantities.
Sketches, diagrams or photographs of typical existing passenger and freight stations, water and fueling facilities, shops, tunnels, bridges, retaining walls, drainage works and other significant structures.
Location sketches for major new buildings, structures and yards.
Preliminary plans for modification of existing structures and for construction of typical new stations, yards, signal systems, servicing facilities, structures, culverts, drainage ditches, etc., in sufficient detail to permit reasonably close estimate of materials and work quantities.
Preliminary schedule of drainage structures by type, giving numbers and total length of each type and size.
Results of soils and subsurface investigations for determination of quality of foundations for fills and major structures and for location of quarries and borrow pits.

F. Construction Standards

Outline specifications defining the proposed standards of quality of construction, which will have a major effect on the cost of construction, with specific justification for any unusual standards which are adopted to fit the local situation and conform with local standards.

G. Availability of Local Resources and Equipment

Skilled and unskilled labor, including "trainability".
Technical and supervisory personnel.
Major construction materials - lumber, ties, ballast rock, building stone, cement, aggregates, water, metal pipe, etc.
Housing, food, fuel and lubricants, repair shops, etc.
Suitable sites for construction yards and construction camps.
Construction equipment.
Local subcontractors.

H. Special Construction Problems Foreseen

Climatic conditions, especially time and length of wet and dry seasons as they affect the construction schedule.
Rerouting of traffic during construction.
Limitations on construction schedule due to long-lead-time equipment and materials.
Evaluation of possible major causes of delay - slides, earthquakes, floods, labor troubles, political disturbances, etc.

I. Plan for Execution of Project

General sequence of construction operations, including identification of major elements which control time and cost.
General plans for grading operations as related to equipment requirements, haul distances, requirements for haul roads and access roads to quarries and borrow pits, etc.
Plan for production of ballast and aggregate.
Description of track laying and ballasting operations.
Construction methods, particularly as to the use of manual labor vs. equipment.
Proposed methods of contracting for engineering, construction, and construction supervision (see Chapter I).
Phased engineering and construction schedule showing timing and duration of major work items.

J. Maintenance Organization

Description of Applicant's present and proposed maintenance and operating organization.
Applicant's ability to provide the necessary level of maintenance and operation for new railway facilities when completed.
Availability of equipment and trained personnel required for operation and maintenance.

Plan for recruiting and training.
Applicant's ability to finance the additional maintenance and operating costs and plans for providing funds at proper time.

IV. FINANCIAL ASPECTS

A. Estimated Capital Cost

Estimates of cost of land, engineering, construction, rolling stock and equipment, prepared in accordance with Annex A for construction portion of project.
Total estimated capital cost in U. S. dollars and local currency:
To be financed by Applicant.
To be financed by loan/grant.

B. Working Capital Requirements

Amount required at start-up and at the end of the first, second and third years of operation, to cover fuel stocks, operating supplies, maintenance materials, accounts receivable and cash on hand.
Anticipated occurrence of peaks in working capital requirements and method contemplated to meet such peaks.

C. Total Initial Capital Requirement

Initial capital cost.
Working capital at start-up of operation.
Total capital requirement.

D. Maintenance and Operation Cost

Estimate of annual cost of operation and maintenance including labor, fuel, supplies, power, repair parts, supervision and administration, broken down into local currency and foreign currency costs.
Comparison with the maintenance and operation costs of the present railway or other railways in the country or elsewhere.

E. Annual Operating Cost

Estimates of annual operating costs, projected through the proposed amortization period, including:
Maintenance and operation.

Depreciation on structures and equipment.
Interest on loans.
Taxes (property, income, etc.).
Total.

Extent to which above estimates have taken into account any governmental preferences, tax remissions, tax deferments or subsidies.

F. Annual Revenues

Proposed fares and freight rates and comparison with existing rail, airline and highway transport rates.

Estimated annual income from fares, freight charges and other sources, projected through the proposed period for amortization.

Comparison with present annual revenues of the existing railway, showing the increase brought about by completion of the project.

G. Profitability

Estimate of profit and loss, conforming generally with Annex E.

Estimated return by years on total capital cost and on owner's investment.

General conclusion as to profitability of the enterprise.

V. COMPARISON OF BENEFITS AND COSTS

Summary of tangible and intangible benefits as described in Section II above, with estimate of monetary value so far as practicable.

Comparison of benefits with costs.

CHAPTER XIII

ECONOMIC AND TECHNICAL SOUNDNESS ANALYSIS SCHOOL OR HOSPITAL PROJECTS

(Construction, reconstruction or enlargement of a school, college, university, hospital or medical center, and auxiliary buildings and facilities in connection therewith).

(All topics in this outline should be considered in the Analysis in so far as they are applicable to the project. Others should be included as necessary to complete the demonstration of the economic and technical soundness of the particular undertaking).

I. SUMMARY

Location, nature and size of proposed school or hospital project.
Relation to the existing school system or present medical facilities in the community.
Description of major features of design.
Estimates of benefits and costs.
Reference to any applicable reports, particularly reports on community school programs and requirements, and reports on existing medical facilities and general hospital planning (attached or readily available elsewhere).

II. ECONOMIC ASPECTS AND BENEFITS

A. Description of the Community

Description of climate, average rainfall and temperature and elevation above sea level.
Population and principal occupations.
School enrollment in relation to total population and general level of literacy.
General level of health and sanitation.

B. Present School System

Types of schools in the community (primary, elementary, secondary, etc.).
Number of pupils in each grade.
Type and age of building in each case, and capacity, safety and present condition.
Location of schools with reference to centers of residential areas, accessibility and environment.

Availability of recreation areas.
Availability of land for construction of new buildings or additions to existing buildings.

C. Present Hospital Facilities

Existing public hospitals and medical, nursing and treatment facilities.
Total number of beds in relation to community population.
Existing private facilities for diagnosis, hospitalization and treatment.
Availability of land for construction of new buildings or additions to existing buildings.

D. Position of Project in Overall Program

Extent to which inadequacies of community schools and hospitals are retarding economic growth of the community.
National, regional or community program for development of schools and hospitals and priority of the project within this program.

E. Anticipated Benefits

Increase in the education and health of the local population.
General economic effect of improved or expanded school and hospital facilities.
Direct benefit to local population through local expenditures of the project funds themselves for labor, materials, food, rents, etc. (temporary benefit).

III. ARCHITECTURAL-ENGINEERING ASPECTS AND TECHNICAL SOUNDNESS

A. Factors Creating Demand for Schools and Hospitals

Size, description and economic activities of the population.
Forecast of population growth, giving basis of prediction.

B. Basic Data for School Project

Results of any surveys that have been made to determine program needs, school enrollments, and needed additional school plant.
Coverage of the surveys and by whom made.
School-age population data - past trends and future forecast, by age levels and by percentage of adults of child bearing age.
School enrollments in past years in public and non-public schools,

trends by grade levels, effects of community industrial activity, influence of transportation facilities and traffic barriers, and effects of new housing developments.

Forecast of future enrollments by areas and by grade levels.

Requirements of new school or school addition:

Grade levels covered and size of classes.

Special facilities for vocational training or teaching of handicapped children.

List of classrooms and special rooms.

List of other spaces and services.

Facilities for community use for summer classes or recreation, adult classes, adult recreation, community meetings and community libraries.

Special plant facilities for lunchroom service, health clinic service, libraries, etc.

Types of equipment and furnishings to be provided.

C. Basic Data for Hospital Project

Need for additional hospital facilities.

Number of beds to be provided.

Types of services to be offered.

Extent of out-patient service.

Community welfare activities to be accommodated.

Special requirements as to power, lighting, heating and air conditioning.

Site to have suitable surroundings.

Building to be oriented to take best advantage of sunlight and prevailing wind.

Types of equipment and furnishings to be provided.

D. Design Criteria

Space requirements per pupil or per hospital bed.

Degree of lighting, heating and ventilation required.

Reliability of water and power supplies.

Noise limitations.

Structural safety.

E. Preliminary Studies and Plans

Location map showing boundaries of the community and location of existing and proposed schools and hospital facilities.

Project site studies, including:

Topography and present use.

Access roads or streets.

Results of soils and subsurface investigations for determination of character of foundations.

Location of all existing utilities.

Availability of potable water and water for fire suppression and other uses.

Suitability from standpoint of accessibility, noise, smoke, odors and proximity of breeding grounds for flies and mosquitos.

Comparison with possible alternate sites.

Preliminary plans for buildings and structures in sufficient detail to permit the calculation of quantities of materials and work.

Schedules showing space provided for various types of rooms (classrooms, laboratories, libraries, wards, surgeries, nurses accommodations, administrative offices, etc.) and comparison of such quantities with corresponding quantities provided in similar installations elsewhere.

Plans for site grading, access and interior roads, landscaping and vehicle parking.

Preliminary plans for all utilities, including sewers and sewage disposal facilities.

List and location of all major built-in equipment, including water treatment, heating and ventilating, electrical transformers, kitchen, toilet and wash-room, lighting fixtures, etc.

List of movable furniture and equipment, including essential hospital equipment.

Approximate list of supplies needed for initial operation.

Anticipated use of consultants on specialized phases of final design.

F. Construction Standards

Outline specifications for equipment and construction defining particularly those standards of quality which will have a significant effect on the cost of construction, with specific justification for any unusual standards adopted to conform with local conditions.

G. Construction Labor, Materials and Equipment

Manpower requirements and availability, including skilled and unskilled labor, and technical and supervisory personnel.

Local availability of cement, steel, aggregates, water for concrete, building stone, lumber and other construction materials.

Types of construction equipment required for the work, indicating what is available locally and what must be imported.

H. Special Construction Problems Foreseen

Climatic conditions, especially time and length of wet and dry seasons as they affect construction schedule and equipment use.

Necessity of keeping an existing school or hospital in service during construction.

Time required to obtain delivery of imported materials and equipment.

I. Plan for Execution of Project

General construction plan.

Proposed methods of contracting for engineering, construction and construction supervision (see Chapter I).

Tests to be performed on installed equipment.

Equipment guarantees to be required.

Engineering and construction schedule (attached).

J. Maintenance and Operating Organization

Applicant's present and proposed teaching and hospital staffs and ability to finance additional personnel needed.

Applicant's present and proposed maintenance organization.

Applicant's ability to provide and finance the necessary level of maintenance of the new facilities when completed.

Availability of trained teaching, hospital and administrative personnel.

Plans for recruiting and training.

IV. FINANCIAL ASPECTS

A. Estimated Capital Cost

Estimates of cost of land, architecture, engineering and construction, prepared in accordance with Annex A so far as applicable.

Total estimated capital cost in U.S. dollars and local currency:

To be financed by Applicant.

To be financed by loan/grant.

B. Maintenance and Operation Cost

Estimate of annual cost of maintenance including labor, supplies, power, spare parts and supervision, broken down between local currency and foreign currency costs.

Comparison with the maintenance and operation costs of present community facilities or similar facilities elsewhere.

V. COMPARISON OF BENEFITS AND COST

Tangible and intangible benefits as described in Section II above, with estimate of monetary value so far as practicable, compared with annual cost, including interest and amortization of investment and operating and maintenance charges.

ANNEXES

Annex	Subject
A	Cost Estimate - All Types of Project
B	Circular No. A-47, Bureau of the Budget
C	Balance Sheet, Industrial or Commercial Project
D	Financial Information, Industrial or Commercial Project
E	Forecast of Earnings, Receipts and Expenditures, Industrial or Commercial Project
F	Production Cost, Industrial Project
G	System Requirements, Electric Power Project
H	Capital Costs, Electric Power Project
I	Annual Production Costs, Electric Power Project
J	Balance Sheet, Electric Power Project
K	Financial Projection, Electric Power Project
L	Benefit-Cost Summary, Hydro-electric Power Project
M	Computation of Benefits to Land Owners, Irrigation Project

COST ESTIMATE

A. Land and Right-of-Way

Cost in local currency (paid or to paid by Applicant).

B. Engineering Costs - broken down into local currency and U.S. dollars.

Preliminary engineering up to time of application.

Additional surveying and test borings.

Final design, preparation of contract documents, construction contract supervision and inspection.

C. Construction Costs - broken down into local currency and U.S. dollars.

1. Estimate of direct cost of each principal work item, showing labor, materials and installed equipment costs, based on the following factors, which are to be described or defined in sufficient detail to permit independent evaluation of the results:

Work item quantities and breakdown as required, where equipment methods, or production factors result in significantly different unit costs within a single work item.
Materials requirements and prices at jobsite.
Construction methods and construction schedule
Phased manpower requirements.
Phased equipment requirements.
Assumed production rates for labor and equipment.
Wage and salary scales (including local and imported).
Hourly or daily rates and all fringe benefits, such as social security, vacation pay, medical, family and displacement allowances, etc.
Construction equipment costs.
Cost delivered to work-site.
Unamortized remaining value at end of job (to be specifically shown).
Cost charged to the job and prorated to work items.
Derived unit costs of principal work items.

2. Indirect Costs (Prorated to work items).

   Contractors' plant, construction camps, local transportation of personnel and supplies, access and service roads, property safeguards, shops, etc.
   Transportation and repatriation of imported personnel.

3. Contingencies.

4. Contractors' home office overhead and U.S. procurement expense.

5. Contractors' profit.

D. Summary of Estimated Cost

Item	Funds Requirements		Total, Expressed in	
	Local Currency +	U. S. Dollars	Local Currency	U. S. Dollars
Land and Right-of-Way				
Engineering Costs				
Direct Cost of Work				
Indirect Costs				
Contingencies				
Contractors' Overhead				
Contractors' Profit				
Totals				
Portion to be Financed by Applicant				
Remaining Cost to be Covered by Loan/Grant				

EXECUTIVE OFFICE OF THE PRESIDENT

BUREAU OF THE BUDGET

WASHINGTON 25, D. C.

December 31, 1952

TO THE HEADS OF EXECUTIVE DEPARTMENTS AND ESTABLISHMENTS

SUBJECT: Attached Bureau of the Budget Circular No. A-47

In connection with the attached Circular, it is desired to bring to your attention a memorandum regarding the Circular which is being sent to the heads of the agencies having responsibility for the development of water and related land resources programs. The memorandum is as follows:

EXECUTIVE OFFICE OF THE PRESIDENT
Bureau of the Budget
Washington 25, D. C.

December 31, 1952

MEMORANDUM FOR:

Secretary of Agriculture
Secretary of the Army
Secretary of Commerce
Secretary of the Interior
Secretary of State
Chairman of the Federal Power Commission
Administrator of the Federal Security Administration
Chairman of the Board of the Tennessee Valley Authority

Subject: Bureau of the Budget Circular on water resources projects.

The attached Bureau of the Budget Circular No. A-47 is designed to set forth the standards and procedures which will be used by the Executive Office of the President in reviewing proposed water resources project reports and budget estimates to initiate construction of such projects, submitted in accordance with existing requirements.

It has been generally recognized that the absence of a clear statement of uniform standards and procedures has resulted in delays and difficulties in the clearance of project reports. The attached Circular, which has grown out of more

than two years of work in the review of water resources policy, is intended to bring together certain of the existing policies of the President which have been set forth from time to time in Executive Office action on project reports, and in some cases to develop modified standards for action on project reports.

While there is general agreement on most of the substantive provisions of the Circular, there remain some differences of opinion with respect to the position taken on certain issues. As indicated in the Circular, however, its issuance is in no way intended to restrict the content of agency reports submitted to the Bureau of the Budget for review on behalf of the President, nor to determine the position which agencies may take with regard to substantive issues. However, it is hoped that, within the framework of existing general provisions of law, the Circular will encourage the adoption of more uniform agency policies and standards, and that it will give the agencies a better basis for presenting all the pertinent information which has a bearing on the merits of proposed projects. Also, since most project reports submitted to the Bureau become the basis for proposed legislation, it is believed that issuance of the Circular will be helpful in pointing up specific policy areas which may require special attention by the President and by the Congress.

It is to be assumed that experience in the application of the Circular will show the need from time to time for modification in its provisions. In particular, it is recognized that further study and refinement will be desirable with respect to (1) the measurement of project benefits, (2) the method of allocating project costs, and (3) the price level assumptions to be used in evaluating both benefits and costs.

The Bureau of the Budget wishes to express its appreciation for the great assistance which has been given by many individuals in the agencies concerned in the preparation of this Circular. It wishes also to acknowledge the value of the report of the President's Water Resources Policy Commission in the preparation of this Circular.

This memorandum is being sent to the heads of all agencies having responsibility for developing water and related land resources programs.

(Signed) Frederick J. Lawton
Director

Attachment

FREDERICK J. LAWTON
Director

Attachment

EXECUTIVE OFFICE OF THE PRESIDENT

BUREAU OF THE BUDGET

WASHINGTON 25, D. C.

December 31, 1952 CIRCULAR NO. A-47

TO THE HEADS OF EXECUTIVE DEPARTMENTS AND ESTABLISHMENTS

SUBJECT: Reports and budget estimates relating to Federal programs and projects for conservation, development, or use of water and related land resources.

1. Purpose. The policies of the President with regard to programs and projects for the development of water and related land resources have been established from time to time both as a part of the normal budget and legislative review process under Bureau of the Budget Circulars No. A-11, "Instructions for the preparation and submission of annual budget estimates," and No. A-19, "Reports and recommendations on proposed and pending legislation," and as a part of the review of project reports under Executive Order 9384, "Submission of reports to facilitate budgeting activities of the Federal Government." This Circular is intended to draw together certain of these policies for water resources programs and projects and to provide the agencies in advance with a better understanding of the considerations which will be used in determining the relationship of a proposed program or project, or budget estimate, to the program of the President.

The standards and procedures set forth in this Circular will be used by the Executive Office of the President in reviewing agency reports and budget estimates subject to its provisions, in order that uniform policies may be applied with a view towards (a) establishing priority for projects yielding the greatest value to the Nation, and (b) securing effective resources development at minimum necessary cost. The priority among programs or projects meeting the standards and procedures set forth in this Circular, and action upon budget estimates to initiate such programs or projects, necessarily will also depend on budget policies established from year to year to meet current economic conditions.

2. Authority. Executive Order 9384, October 4, 1943, requires submission to the Bureau of the Budget of reports relating to or affecting Federal public works and improvement projects. Bureau of the Budget Circular No. A-19, Revised, requires submission to the Bureau of agency reports on proposed and pending legislation. Bureau of the Budget Circular No. A-11, Revised, outlines the requirements for preparation and submission to the Bureau of annual budget estimates. This Circular, No. A-47, supplements the requirements of the Executive Order and Circulars referred to, and is issued pursuant to the authority cited therein.

3. Coverage. This Circular relates to Federal programs or projects for the conservation, development, or use of water and related land resources. It applies to any report and to any budget estimate to initiate construction of a program or project, which, by the terms of the Executive Order and Circulars referred to in paragraph 2, is required to be submitted to the Bureau of the Budget and which involves a program or project of the type referred to in the first sentence of this paragraph. It does not apply to budget estimates for electric transmission lines or steam electric generating plants required in connection with water resources projects.

4. Compliance.

a. Relation to existing law. The standards and procedures set forth in this Circular shall not be regarded as authorizing any deviation from general or specific requirements of law. Whenever a report or budget estimate varies from such standards or procedures because of a requirement of existing law, the variation shall be indicated and reference made to the section of law imposing such requirement.

b. Application to budget estimates. Except as provided in paragraph 4a, a budget estimate subject to this Circular shall conform to the standards and procedures set forth herein.

c. Variations from Circular. This Circular shall not be regarded as requiring an agency to submit a report which is contrary to its views. However, any report which varies from the standards and procedures set forth herein because of agency policies shall, in the same manner as indicated in paragraph 4a, be accompanied by a statement of the reasons for the variation. Each report shall contain or be accompanied by appropriately documented information to indicate the exact extent to which the standards and procedures established herein have been followed in the preparation of the report. Where the preparation of the basic report is so far advanced on the date of issuance of this Circular that it would be impracticable to furnish the information required by this Circular, this fact will be taken into account in the consideration of the report. All reports submitted after July 1, 1953, however, must conform to the requirements of this Circular.

5. Definitions. For the purposes of this Circular:

a. "Project" means any integral physical unit or several component and closely related units or features, or any system of measures, undertaken or to be undertaken within a specified area for the control or development of water or related land resources, which can be considered as a separate entity for

purposes of planning, evaluation, financing, construction, management, or operation. Separable units or features will generally be considered as separate projects.

b. "Program" means any combination or system of two or more interrelated projects.

c. "Benefits," as used for purposes of evaluation of proposed programs or projects, means all the identifiable gains, assets, or values, whether in goods, services, or intangibles, whether primary or secondary, and whether measurable in monetary or nonmonetary terms, which would result from the construction, operation, or maintenance of a program or project.

d. "Primary benefits" means the identifiable gains, assets, or values directly resulting from any program or project.

e. "Secondary benefits" means identifiable gains, assets, or values other than primary benefits of a program or project which are properly creditable to the program or project.

f. "Economic costs," as used for purposes of evaluation of proposed programs and projects, means all the financial costs of the program or project except investigating, surveying and planning costs incurred prior to authorization; and all the other identifiable expenses, losses, and liabilities, whether in goods, services, or intangibles, whether direct or induced, and whether measurable in monetary or nonmonetary terms, which are incurred as a result of constructing, operating, or maintaining a program or project.

g. "Financial costs" means all the monetary outlays made in connection with a program or project and interest costs connected therewith; i.e., the construction costs, the operation and maintenance costs, and interest on the unliquidated balance of the reimbursable construction costs. When applied to allocations made to irrigation for repayment purposes under paragraphs 7a and 18b, "financial costs" shall not include interest on the irrigation construction costs.

h. "Construction costs" means expenditures (amounts paid and payable) for the initial project construction and the net replacements and additions of significant units thereof, including contract work, materials and supplies, labor, and use of equipment; acquisition of lands, easements, rights-of-way, and water rights; costs of relocating facilities and the settlement of damage claims; interest during construction; any capital expenditures for protection of public health, for preventing loss of or damages to recreation, fish and wildlife and mineral resources, and scenic, archeological, and historical

values; any capital expenditures for the replacement of recreation and fish and wildlife resources damaged or destroyed by the project; the appropriate portion of engineering, administrative and general expenses of the agency relating to the project; and all other amounts of expenditures specifically applicable to the investigations, surveys, plans, designs, and construction of the project. When applied to allocations made to irrigation for repayment purposes under paragraphs 7a and 18b, "construction costs" shall not include interest during construction on the costs allocated to irrigation.

i. "Operation and maintenance costs" means those expenditures for materials and supplies, labor, necessary services, equipment and operating facility use, and an appropriate portion of engineering, supervision and general expenses of the agency which are needed to operate a project once constructed and to make repairs, minor additions and replacements, and otherwise to maintain the project in sound operating condition for a maximum economic life. This includes any expenditures of the project, other than capital expenditures, for protection of public health, for preventing loss of or damages to recreation and fish and wildlife resources, and scenic, archeological and historical values; and any expenditures of the project, other than capital expenditures, for the replacement of recreation and fish and wildlife resources damaged or destroyed by the project.

j. "Net revenues" means the difference between the total revenues of the program or project or separable purpose thereof and the properly allocable financial costs of such program, project or purpose.

k. "Reclamation" means making land suitable for productive agricultural use or increasing or maintaining its productive agricultural use by means of (1) irrigation; (2) drainage, excluding drainage undertaken pursuant to Section 2 of the Act of December 22, 1944 (58 Stat. 887), and excluding drainage undertaken solely to counteract the effects of flood control works; and (3) recharging of ground waters.

6. State, local, and Federal participation. Agencies responsible for developing proposed programs or projects shall, as now provided under certain laws and administrative practices, consult with the people of the area primarily affected and with the State and local governments and Federal agencies concerned. This consultation should take place at the earliest feasible stage and should be continued throughout the investigation, survey, and planning stages, in order that the views of these groups and agencies may receive adequate

consideration. Such consultation need not be repeated at the time budget estimates to initiate a program or project are being prepared; however, budget estimates shall include the latest information available on the views of Federal agencies, States, and interested local groups as to priorities of project development, scheduling of construction, and willingness to comply with requirements for local participation.

7. Information for inclusion in, and criteria for review of, evaluation reports.

a. The following categories of information, some of which are elaborated in later paragraphs of this Circular, shall be included in the evaluation report proposing authorization of a new water or related land resources program or project. Under certain of the categories of information listed below, there are indicated the criteria which will be used by the Executive Office in the review of proposed program or project reports:

(1) A description of the need for the production or services which would result from the program or project; the relation of the program or project to the other elements of the resource development program of the region in which the program or project is to be undertaken; the contribution of the program or project to balanced national conservation and development; and the efficiency of the program or project in meeting regional or national needs.

An important consideration in the review of evaluation reports will be whether execution of the program or project, and, within practical limits, execution of each separate part of a program or project, will be more economical than alternative means available in the region for meeting the same needs. Where a single-purpose alternative is available, inclusion in a multiple-purpose program or project plan of any purpose of resource development will be considered only if the purpose is accomplished more economically through the multiple-purpose program or project than through the single-purpose alternative. A further consideration in the review of evaluation reports will be the relative economy of alternative means available on a national basis for meeting the needs to be met by the program or project.

(2) A concise but complete estimate of all the benefits and all of the economic costs of undertaking the program or project. In addition to comparing the total benefits

of the program or project with its total economic costs, the estimate should also show separately the particular benefits and economic costs attributable to each purpose of the program or project. Wherever appropriate, benefits and economic costs shall be expressed in monetary terms. Where monetary estimates cannot reasonably be made, the relative significance of such benefits and costs shall be stated in as precise and quantitative terms as possible. Because any long-term estimates are subject to wide margins of error, the results should be expressed in ranges rather than in single figures. The estimate should be made from an over-all public or national viewpoint and should indicate any specifically identifiable groups, localities, or districts receiving program or project benefits.

While it is recognized that a comparison of estimated benefits with estimated costs does not necessarily provide a precise measure of the absolute merits of any particular program or project, one essential criterion in justifying any program or project will, except in unusual cases where adequate justification is presented, be that its estimated benefits to whomsoever they may accrue exceed its estimated costs. Inclusion in a multiple-purpose program or project plan of any purpose of resource development will, except in unusual cases where adequate justification is presented, be considered only if the benefits attributable to that particular purpose are greater than the economic costs of including that purpose in the program or project. Monetary computations will be most useful in arranging programs or projects, or parts thereof, serving the same purpose in the order of their economic desirability.

(3) All data relating to the financial feasibility and to the allocation and reimbursement of financial costs prepared in accordance with the standards set forth in paragraphs 11-21. This shall include a statement as to the financial feasibility of reimbursable features of the program or project and the net effect of the program or project on the Federal Treasury. For this purpose the project report shall show an analysis of the sources of repayment or sharing of the financial costs of each of the purposes involved in the program or project. Financial costs shall be converted to an annual basis to make possible a comparison of annual financial costs and annual revenues of any program or project or separable purpose thereof.

(4) A statement as to the source and nature of, and an appraisal of the adequacy of, the basic information available and used during the preparation of such program or project and the methods employed in the analysis and interpretation of such basic information.

b. Requests for funds for the initiation of construction of a program or project following authorization shall be accompanied by a statement indicating the changes which have occurred, if any, since submittal of the original report upon which authorization was based, affecting the total cost, the economic evaluation, or the purposes of the program or project. If substantial changes have occurred, the request shall be accompanied by a revised evaluation report.

8. Benefits to be included in evaluation. The evaluation report prepared in accordance with paragraph 7 shall include an estimate of the primary benefits of the program or project. Unless the report sets forth clear justification for considering other factors, main reliance in the review of project reports will be placed on the following categories of primary benefits:

a. Reduction of flood damage, including damage from water and sediment, to land and other public and private property; and prevention of loss of life.

b. Increases in the expected net income obtained directly from changed use of the property made possible by any form of flood control.

c. Increases in expected net income from lands on which watershed treatment measures are to be installed as part of the program or project.

d. Increase in expected net farm income from additional production or reduced cost of production of farm products as a result of reclamation of land.

e. In the case of navigation projects other than harbor improvements, the transportation savings resulting from:

(1) The differential between expected costs of movement by non-water transport and expected costs of movement by water transport for those commodities which will be carried by land transport if the project is not built, but which will move by water if the project is built.

(2) For traffic which will not move without the waterway improvement, but which will move by water if the project

is built, the differential between the cost of transportation by waterway and the highest cost at which it would be feasible for the traffic to move.

(3) Where the project improves an already navigable waterway, the differential between expected costs with and without the project of moving on the waterway traffic expected to move on the waterway even if the project is not built.

f. Direct benefits of shore protection.

g. Direct benefits from harbor improvements, including those for small boat traffic.

h. Value of electric energy to be produced. This is equal to the lower of two figures:

(1) The cost of equivalent energy from the cheapest alternative source of energy--private, Federal, or other--that is available, or could be expected to develop in the absence of the project, to meet the same power needs. Taxes and interest charges for this alternative source should be computed on a basis comparable with the project.

Note.--Where the project plan includes the cost of constructing and operating the necessary facilities to transmit and distribute the project power to load centers, the costs of the alternative source with which the project is compared should also include transmission and distribution costs to the same load centers. Where the project plan does not include transmission costs, the total costs incurred by the alternative source in providing power at load centers should, for purposes of determining power benefits, be reduced by the transmission costs incurred in bringing the project power to the same load centers.

(2) Value of power to users (considered as the highest price they would pay and applicable especially where the cost of alternative power would be prohibitive for particular users).

i. Value of municipal, industrial, and domestic water supply to be furnished, measured by the cost of obtaining equivalent supply from the cheapest alternative source that would most likely be used in the absence of the project, including the cost of development of the same source of water by the water users themselves as one of the alternatives. Taxes and interest charges for the alternative source should be computed on a basis comparable with the project.

j. Increases in the value of recreation and fish and wildlife resources expected as a result of the project. Although such benefits are usually not subject to measurement in monetary terms, complete information, in terms of the amount and type of expected use of recreation and fish and wildlife developments is required as a basis for comparison of the incremental costs and benefits of such developments referred to in paragraphs 11c and 19b.

k. Savings in the cost of water treatment or gains in the value of streams for industrial, municipal, and domestic water supply, and other uses, through the abatement of water pollution; and reduction in the cost of pollution abatement by stream flow augmentation. Such benefits should be calculated as the residual benefit possible after allowing for all direct measures to control pollution at the source that would normally be required or considered necessary by the public health authorities concerned.

The evaluation prepared in accordance with paragraph 7 shall also include an estimate of any secondary benefits which the program or project will provide. The evaluation shall include a separate showing of total primary and total secondary benefits. Until standards and procedures for measuring secondary benefits are approved by the Bureau of the Budget, the evaluation shall be based mainly upon primary benefits.

The evaluation shall also include an appraisal of the general benefits which will accrue through such effects as safeguarding life and public health, stabilizing national and regional food and raw materials production, and contributing directly to the improvement of technically underdeveloped areas within the Nation's boundaries.

9. Costs to be included in evaluation. The evaluation prepared in accordance with paragraph 7 shall include an estimate of the total construction costs and the total operation and maintenance costs of the program or project, whether such costs are incurred by the Federal Government, State and local governments, or private interests.

Such an evaluation shall also include a statement of economic costs expected to be induced by the program or project, such as the costs of:

a. Displacement of people.

b. Decreased value of lands, minerals, water quantity or quality, and other water or related land resources, where not reflected in market values.

c. Rectifying adverse effects upon sanitation, transportation, highway construction or maintenance, or other activities reasonably foreseen as being affected by the program or project.

d. Business losses, such as disruption of trade or diversion of waterborne traffic from existing ports or channels.

e. Losses in State or local tax revenues, adjusted for changes in costs of State and local government services caused by the existence of program or project facilities.

f. Unprevented and uncompensated losses of or damages to fish and wildlife resources; recreation resources; and scenic, archeological or historical values.

g. Abandonment of economically useful structures, such as locks and bridges.

Such an evaluation shall also include an appraisal of other detriments to the general welfare, whether or not they can be measured in monetary terms, and the groups which will suffer any substantial injury should be identified so far as feasible.

10. Comparison of benefits and economic costs. Benefits to be obtained and economic costs to be incurred throughout the assumed economic life of a program or project, as limited by paragraph 14 of this Circular, where expressed in monetary terms, shall be converted to a common time basis to facilitate the comparison called for in paragraph 7a(2). Where benefits and economic costs are compared on an annual basis, interest on the construction costs should be included in the computation of average annual equivalents for total economic costs. Where the present net worth method of comparing benefits and economic costs is to be used, future benefits and economic costs should be discounted to present values. Using an interest rate to cumulate benefits and economic costs is necessitated where the net gain or loss at any given time during the operation of the program or project is to be computed. Determination of the applicable interest or discount rate shall be made in accordance with paragraph 15, except for the interest rate on project costs to be financed by non-Federal sources.

11. Purposes to which costs may be allocated and criteria for allocation of costs. The evaluation report prepared in accordance with paragraph 7 shall include a tentative allocation of the construction costs and operation and maintenance costs of the program or project to the several purposes to be served, which allocation shall serve as the basis for the proposed reimbursement and cost-sharing arrangements recommended in the report. Proposals for the allocation of costs will be reviewed in accordance with the following standards:

a. Subject to the criteria set forth in paragraphs b and c following and paragraphs 19 and 20, costs of both separable and joint facilities shall be equitably allocated to the following purposes and to no other purposes:

(1) Flood control
(2) Reclamation
(3) Navigation
(4) Watershed management
(5) Electric power and energy
(6) Domestic, municipal, or industrial water supply
(7) Recreation development
(8) Fish and wildlife development
(9) Pollution control or abatement

b. Costs of programs or projects shall be allocated to the several purposes for which they are undertaken on the following basis:

(1) The costs of facilities or features of a program or project used only for a single purpose of water resources development shall be allocated to the respective purposes served by such facilities or features.

(2) The costs of facilities or features of a program or project used jointly by more than one purpose of water resource development shall be allocated among the purposes served in such a way that each purpose will share equitably in the savings resulting from combining the purposes in a multiple-purpose development.

c. Allocations of costs to items (8) and (9) of paragraph a above shall be governed by the following:

(1) Allocations of costs to fish and wildlife shall be limited to the following:

(A) Costs incurred for the development of fish and wildlife to the extent that such costs are to be borne by States, local governments, or local interests.

(B) The increment of additional costs of a project incurred for fish and wildlife development if the fish and wildlife resources to be developed are determined by the Secretary of the Interior in accordance with present law to be of national significance, and if either (a) the work is proposed to be authorized as a part of a national

fish and wildlife program and financed under appropriations made for that purpose, or (b) the letter transmitting the proposed report to the Congress contains proposed authorizing language stating the maximum amount of such costs which would be borne by the Federal Government.

(2) Allocations of costs to pollution control or abatement shall be limited to those costs for that purpose which are to be fully reimbursed by the States, local governments, districts, or other interests concerned, including other Federal establishments.

12. Responsibility for allocation of costs on multiple-purpose programs or projects. For purposes of this Circular, the head of the agency responsible for construction of the program or project will be considered responsible for:

a. Making the initial tentative allocation of costs among the purposes to be served by a program or project.

b. Making a revised cost allocation prior to the submission of a budget estimate to initiate the program or project if the costs can be ascertained with greater accuracy at that time than at the time of submission of the project report, or if the designated use of the program or project is changed, or if the estimated costs have changed substantially. Where designated use is changed or estimated costs have changed substantially, the head of such agency shall also indicate the reasons therefor.

Other agencies having responsibilities with respect to various purposes of the project, such as power marketing, rate approval, reclamation, navigation, flood control regulation, etc., shall be afforded full opportunity to consult and make their views known at both these stages in the determination of the cost allocation.

13. Reimbursement and sharing of costs. For the purposes of this Circular, it is essential that definite determinations be made as to which part of the financial costs of a proposed program or project will be reimbursed to the Federal Government, which will be borne by others than the Federal Government, and which will not be reimbursed. With respect to financial costs to be reimbursed and cash contributions to be made, the proposed source of funds therefor shall be clearly indicated. Where cash contributions are required, such requirement shall be expressed as a percentage of the construction costs of the program or project, rather than in dollars. Where repayment is to be made over a period of time, a tentative schedule of payments

to be made to the Federal Government shall be established. With respect to any further financial costs to be borne by others, such as contributions of property, the nature of the cost-sharing arrangements to be entered into by the Federal Government shall be indicated. With respect to nonreimbursable costs, the authority relied upon in declaring such costs to be nonreimbursable shall be clearly indicated; where no legislative authority exists, justification shall be presented for proposing that the costs be considered nonreimbursable.

14. Length of repayment period. Proposals for repayment of the Federal investment in a program or project will be reviewed in accordance with the following standards:

a. Rates and other charges for the products or services of a program or project shall be set so that repayment of the initial Federal investment in the program or project can be accomplished within a period equal to the useful economic life of the proposed program or project, but not longer than 50 years, following the date on which the head of the sponsoring agency determines that benefits from the program or project will be available to the beneficiaries. This same period of time with the same limitation shall be used for computing benefits and costs of the proposed program or project.

b. In the case of a major replacement, modification, or addition to a project, the cost thereof shall be reimbursed within (1) the estimated useful economic life of such replacement, modification, or addition, (2) the estimated remaining useful economic life of the project to which it is an addition, or (3) 50 years, whichever is least, following the date on which the head of the sponsoring agency determines that benefits from the replacement, modification, or addition will be available to the beneficiaries. In the case of a major replacement, modification, or addition to a project serving power or domestic, municipal, or industrial water supply, the unliquidated balance of the initial Federal investment allocated to such purpose, together with any unpaid interest or other expenses may be proposed for re-scheduling of repayment over the same period of time as is proposed for repayment of the cost of the major replacement, modification, or addition.

c. Where a major new power or domestic, municipal, or industrial water supply project or major portion thereof is to be operated in conjunction with, or as a part of, an existing system of projects serving the same purpose or purposes, the portion of the initial construction costs of the existing system allocated to that purpose which is unliquidated at the time such new project or portion of a

project is to be added, together with any unpaid interest or other expenses, may be combined with those costs of the new project or portion thereof allocated to that purpose; and the rates and charges required for the repayment of the total combined costs may be computed so as to repay these costs over the useful economic life of the new project or portion thereof but in not to exceed 50 years, provided that the system to which the new project is to be added has a remaining useful economic life at least equal to that of the proposed new project. For each proposed addition to an existing system, there should be a separate estimate of the benefits, economic and financial costs, and the revenues from or attributable to the new project or portion thereof.

15. Determination of interest rate on Federal investment. Interest for purposes of estimating reimbursements shall be calculated at a rate based upon the average rate of interest payable by the Treasury on interest-bearing marketable securities of the United States outstanding at the end of the fiscal year preceding such computation which, upon original issue, had terms to maturity not more than 12 months longer or 12 months shorter than the economically useful life of the project or part thereof in which Federal investment is to be made. Where the economically useful life of the project is expected to be longer than 15 years, the rate of interest shall be calculated at a rate based upon the average rate of interest payable by the Treasury on obligations, if any, outstanding at the end of the fiscal year preceding such computation, which, upon original issue, had terms to maturity of 15 years or more.

If there are no such outstanding interest-bearing marketable securities of the United States with original terms to maturity not more than 12 months longer or 12 months shorter than the economically useful life of the project, or with original terms to maturity of 15 years or more, interest shall be calculated at a rate equal to the rate of interest payable by the Treasury on the issue of interest-bearing marketable securities of the United States outstanding at the end of the fiscal year preceding such computation which, upon original issue, had terms to maturity shorter than, but most nearly equal to, the economically useful life of the project.

Where the average rate calculated by the methods prescribed above is not a multiple of 1/8 of 1 percent, the rate of interest shall be the multiple of 1/8 of 1 percent next lower than such average rate.

16. Additional standards relating to power.

a. Proposals for the incorporation in a program or project of power features will be reviewed in accordance with the criterion that total financial costs allocated to power shall

be fully reimbursable. For this purpose, the project report shall include an estimate of the revenues to be obtained from the sale and disposition of the program or project power and any other funds which may be derived from the generation, transmission, sale, and disposition of such power, or activities incidental thereto.

b. Where a program or project contemplating immediate or eventual construction of power facilities is proposed for legislative authorization, the report on such program or project shall include a statement of the views thereon of the Federal Power Commission, the agencies concerned with marketing power produced at Federal plants in the region, and other appropriate agencies. Agencies submitting such views shall be given reasonable notice by the agency proposing a program or project involving power facilities of the latter agency's intention to complete the evaluation of the program or project. If the views of the agencies referred to above are not made known to the agency proposing the project within 90 days after completion of the main program or project report, the head of the agency proposing the program or project may submit the report thereon to the Bureau of the Budget without an accompanying statement of the views of these agencies.

Such statements will be used in determining (1) the need for the additional power which such program or project would make available, (2) the cost of such additional power at load centers, compared with the cost of equivalent power from alternative sources in the same region, (3) the revenues which would be derived from the sale of the additional power, (4) the effect of the program or project on the rate of depletion of the fuel resources of the region or Nation, and (5) recommendations as to the timing of the installation of generating and other power facilities as part of, or incidental to, the program or project.

17. <u>Additional standards relating to flood control.</u>

a. In the preparation of any program or project report concerned with flood control, the head of the agency proposing such program or project shall give consideration in the report to all methods of preventing or reducing flood damage in each particular instance and shall include a report on the most effective and most economical choice or combination of one or more of the following methods of alleviating flood damage:

(1) Flood plain development and redevelopment, relocation, and zoning.

(2) Sedimentation and runoff control.

(3) Storage of flood waters on cultivated fields, other watershed lands, or underground through appropriate measures.

(4) Levee and flood wall construction.

(5) Reservoir storage.

(6) Channel improvement and rectification, bank stabilization, and floodways and diversions.

(7) Flood forecasting.

(8) Such other measures as will result in effective flood damage prevention or control.

If the head of the agency preparing such a report finds that flood damage can be prevented most effectively and economically through adoption by States, local governments, or districts of programs for flood plain development and redevelopment, relocation, and zoning, or other similar measures, either in substitution for, or as a supplement to, construction of flood control works, he shall include in his project report information as to the extent to which it may be feasible to enter into arrangements with such States, local governments, or districts providing for Federal assistance to them in carrying out such measures. Such information shall be included on the assumption that the State, local government, or district in question will be authorized to engage in such development, relocation or zoning. As a guide for proposing such arrangements, the share of the cost which may be borne by the Federal Government as assistance to States and local governments for such measures shall be no more than the share of costs which the Federal Government would bear in prosecuting the most economical alternative method of obtaining similar flood control benefits.

b. The report on any program or project having significant main stem flood control benefits, except for those of the Tennessee Valley Authority, shall include a statement of the views of the Secretary of the Army or the Chief of Engineers on such aspects of the program or project. The report on any main stem program or project having flood control benefits, except for those of the Tennessee Valley Authority, shall include a statement by the Secretary of Agriculture indicating the effect any existing or potential flood prevention programs in the tributaries and headwaters of the river would have on the economic justification and feasibility of the main stem program or project.

It would be expected that the views of the Corps of Engineers, the Department of Agriculture, and/or any other agency concerned would, ordinarily, be reconciled prior to the submission of a project report to the Bureau of the Budget.

c. Where benefits of the type described in paragraph 8b of this Circular are attributed to a local flood control project, the project report will be reviewed in accordance with the criterion that there shall be a payment or contribution toward the construction costs of the project equal to at least 50 percent of an amount determined by applying to the total construction costs of the project the ratio of the particular land enhancement benefits involved to total monetary primary benefits as estimated in the evaluation report. To the extent feasible, a payment or contribution toward the costs of the program or project shall also be made where benefits of the type described in paragraph 8b of this Circular are attributed to other flood control or flood prevention programs or projects. In determining the payment or contribution that should be required in these cases, the responsible agency should consider the value of benefits to local beneficiaries. The evaluation report shall explain how the portion of the cost to be borne by local beneficiaries was determined.

18. Additional standards relating to reclamation.

a. Appraisal of reclamation benefits. The report on any program or project having significant reclamation benefits shall include a statement of the views of the Secretary of Agriculture on the economic aspects of such phases of the program or project and his estimates of the effect of such reclamation benefits on the short-range and long-range agricultural needs of the Nation and the region in which the program or project is located, and the place of the program or project within the framework of a desirable long-range program to meet the Nation's and the region's estimated requirements for food, fiber, and other agricultural commodities.

The Secretary of Agriculture shall be given reasonable notice by the head of the agency proposing any program or project having significant reclamation benefits of the latter's intention to complete an evaluation of the program or project. If the report of the Secretary of Agriculture on the economic aspects of the reclamation phases of a program or project is not available within 90 days after the completion of the main program or project report, the head of the agency proposing the program or project may submit the report thereon to the Bureau of the Budget without an accompanying report from the Secretary of Agriculture.

b. Repayment of irrigation costs. Consistent with the standards of this Circular relating to repayment, irrigation project reports submitted for authorization by Congress may propose repayment of irrigation construction costs within 50 years, with allowance for an additional development period of not to exceed 10 years.

Note.--Where irrigation projects are authorized administratively by the Secretary of the Interior under present law, repayment of the construction cost is based on the ability of the water users to pay over a period of 40 years, with allowance for an additional development period of not to exceed 10 years, except that a longer period may be used where the costs are to be returned under contracts entered into pursuant to section 9(e) of the Reclamation Project Act of 1939. Projects in which the returnable allocations, together with non-returnable allocations permitted by existing law, do not equal construction costs may be authorized only by act of Congress.

Pending the enactment of general legislation dealing with the use of the interest component to show assistance in the retirement of construction costs allocated to irrigation, proposed irrigation project reports will be reviewed in accordance with the following criteria:

(1) Irrigation aspects of proposed projects shall meet a test of economic justification made in accordance with the principles, standards, and procedures set forth in this Circular.

(2) Net revenues from other purposes associated with the project may be proposed for use in helping to repay costs allocated to irrigation.

(3) Where the cost allocated to irrigation is in excess of the sum of the anticipated repayments by the water users and other identifiable irrigation beneficiaries, and any net revenues of any separable purposes of the project, the project report shall identify these excess costs and may propose that they be borne by the Federal Government as a subsidy to irrigation. Where a Federal subsidy is proposed, either by use of the interest component or otherwise, the project report shall clearly show the amount and composition of such subsidy, and the letter of transmittal to the Congress shall contain proposed authorizing language stating the maximum amount of such subsidy to irrigation which would be borne by the Federal Government. As soon as feasible,

arrangements will be made to show any such subsidy in the annual Budget presentation to the Congress.

Note.--In determining financial feasibility of irrigation projects, the Department of the Interior has construed Federal reclamation laws to permit the use of interest payments on the construction cost allocated to power or water supply to show assistance in the retirement of construction costs allocated to irrigation that are in excess of the ability of the water users to repay. There has been no general legislation specifically dealing with this policy. The Bureau of the Budget, in clearance of project reports, has never specifically approved or disapproved the policy of applying the interest component to assist in the retirement of costs allocated to irrigation. The use of the interest component for this purpose raises several important policy problems: (a) the interest component represents an indefinite type of subsidy, (b) the interest component may be used to make a project appear to be financially feasible which is not economically sound, and (c) the size of the interest component necessarily varies with the size of the power or water supply investment, and, therefore, the use of the interest component discriminates against irrigation projects which are not directly associated with power or water supply projects or in which such investments are small in relation to the size of the total project.

19. Additional standards relating to recreation. Proposals for recreational aspects of Federal water resources development programs and projects will be reviewed in accordance with the following standards:

a. Recreation potentialities shall be given full consideration in the preparation and evaluation of proposed water resources programs and projects. The financial costs of those aspects of surveys, investigations, and planning required to provide a full and complete understanding of the recreation potentialities of these programs and projects shall be treated as a nonreimbursable Federal expense.

b. Recreation costs and benefits shall be dealt with on an incremental basis; i.e., costs specifically incurred for and benefits directly creditable to recreation shall be evaluated and considered apart from other project costs and benefits. Only the incremental costs expected to be incurred in providing recreational facilities as described in the following paragraphs e and f shall be allocated to recreation.

c. Potential damages to existing recreation areas, facilities, or values shall be recognized in planning for water resources programs and projects, and the financial costs of prevention of such damage, or the replacement of such areas or facilities, to the extent practicable, shall be clearly set forth. All such costs shall be considered as joint or common costs and equitably allocated among the major purposes served by the project.

d. Minimum basic facilities and services for protection of the program or project area and the accommodation or protection of the visiting public, usually at the location of the dam site, shall not be considered recreational facilities, but necessary adjuncts to the construction of Federal projects. The costs of these facilities and services shall be considered as joint or common costs and allocated to the major purposes for which such projects are constructed.

e. When modification in the design of a project or additional development in the project area, including access roads, is required in order to make recreational values available to the public, such modification or development shall be included in the project proposal only if:

(1) The States or local governments or other beneficiaries agree to repay the full cost thereof; or

(2) Such values are clearly indicated to be of national significance in accordance with criteria set forth in paragraph g following; and if either (a) the work is proposed to be authorized as a part of the national park or national forest programs for this area and is to be financed by appropriations made for these programs, or (b) the letter transmitting the proposed report to the Congress contains proposed authorizing language stating the maximum amount of such cost which would be borne by the Federal Government.

f. Where the public interest in the protection and preservation of recreation values of any water resources program or project require the purchase or the setting aside of a limited amount of additional land therefor, any costs thereof may properly be considered a Federal expense and allocated to recreation development. Where such recreation values are not of national significance, however, the costs of such purchase or setting aside of lands shall be recommended as a Federal expense only if State or local governments have, through an appropriate official, indicated an unwillingness or inability to protect and preserve such values. The acquisition of lands by the Federal Government to protect recreation values shall ordinarily be restricted to areas to which access roads

are likely to be built. In cases where recreation values are of State or local significance, the lands acquired by the Federal Government shall be sold, leased or licensed, or (in exceptional cases) granted, under appropriate rules or regulations, to State or local governments for development as soon as possible. All funds derived from such sales or leases shall be deposited in the general fund of the Treasury.

There shall be provided a specific list and description of such lands recommended for acquisition or withdrawal and the reasons why their acquisition or withdrawal is required to protect or preserve recreation values.

g. In determining whether the recreation resources of a Federal water resources project area are of national significance, the following criteria shall be considered:

(1) The water resource project itself is such as to make it a subject of continuing Nation-wide public interest.

(2) The presence within or adjacent to the water resource area of outstanding scenic, historical, scientific, or archeological values of interest to the general public makes development of the recreation resource a matter of national interest.

(3) The recreation area, after development, will probably be used by a substantial number of residents of States other than the State or States in which the project area is located.

(4) The relation and proximity of the water resource project area to a national park, monument, national forest, or wilderness area is such that the recreation development will supplement the program on those federally administered areas.

20. Additional standards relating to domestic, municipal, and industrial water supply. Proposals for water supply aspects of Federal water resource development programs and projects will be reviewed in accordance with the following criteria:

a. Domestic, municipal, industrial, and other similar water supply shall be considered primarily a local and State responsibility. The needs of communities and industries for water supply shall, however, be given full consideration in the investigations, surveys, and preparation of plans for Federal river development programs and projects.

b. Proposals for the incorporation in a Federal program or project of provisions for domestic, municipal, or industrial water supply shall be made only if the total financial costs to be allocated to this purpose will be fully reimbursed by the States, local governments, districts, or persons served.

21. Provision in Federal water resources programs and projects for future requirements. Where a significant saving will result from inclusion in the original plan for a program or project of additional or enlarged structures, facilities, or parts thereof which will serve anticipated future non-Federal needs, as, for example, excess storage capacity in reservoirs for municipal or industrial water supply, provision for such inclusion may be made if:

a. The cost of including the facilities for anticipated future needs, including the properly allocable part of the joint costs of the program or project, represent not more than 15 percent of the total construction costs of the program or project.

b. All financial costs of such additions will be repaid within 50 years after the date on which initial use of such addition is begun, regardless of the degree to which the full capacity provided is utilized during that period. In arriving at the financial costs of such additions, interest on the construction costs during the period of deferral of any use may be waived.

c. Reasonable assurance is given by local interests at the time the project report is prepared that initial use of the proposed addition to the program or project will begin within not more than 10 years, and a repayment contract is signed by local interests prior to the beginning of construction agreeing to start repayment within such 10-year period.

By direction of the President:

FREDERICK J. LAWTON
Director

ANNEX C
INDUSTRIAL OR COMMERCIAL
PROJECT

BALANCE SHEET

Attach comparative balance sheets for the past five years, according to the following breakdown:

Assets

1. Current Assets:

    a. Cash
    b. Marketable securities
    c. Notes Receivable (show separately amounts owed by subsidiaries; directors, shareholders, their families and agents; all other amounts other than normal commercial debts.)
    d. Accounts Receivable from customers
    e. Inventories
    f. Other Assets (describe)

2. Investments:

    a. In subsidiaries
    b. Other Investments (describe)

3. Capital Assets:

    a. Land
    b. Buildings and Site Facilities
    c. Machinery and Equipment
    d. Construction in Progress
    e. Other Capital Assets (describe)

4. Gross Assets: (1 thru 3)

5. Depreciation Reserves (state method of amortization)

6. Net Capital Assets (3 - 5)

7. Intangibles (patents, licenses, good will, trademarks, formulas, franchises, etc.)

8. Other Assets: (specify)

9. Total Assets (6 thru 8)

Liabilities

10. Current Liabilities (due within one year)

    a. Notes Payable
       - to banks or other short-term lending agencies
       - to holders of long-term debt maturing within one year
       - to directors, shareholders, their families, and agents
    b. Accounts payable to commercial creditors
    c. Contractors' bid and performance bonds
    d. Royalties
    e. Other Current Liabilities (describe)

11. Long-term Debt (over one year) (indicate terms)

12. Construction Costs Payable

Capital and Surplus

13. Capital (authorized, issued and paid-in)

14. Reserves: (describe)

15. Surplus:

    a. Revaluation Surplus
    b. Earned Surplus (or Deficit)
    c. Net Surplus or Deficit)

16. Total Liabilities and Capital

    (10 thru 14 minus or plus 15)

ANNEX D
INDUSTRIAL OR COMMERCIAL
PROJECT

FINANCIAL INFORMATION

1. Capital Structure (present and planned)
   Authorized Capital
   Issued Capital
   Subscribed Capital
   Paid-up Capital
   Capital Surplus (if any) arising from asset revaluation

2. Distribution of Shares

	No. Issued	Total Nominal Amount	Total Paid-up Amount	No. of Votes per Share
Ordinary				
Preference				
Deferred				

3. Indicate number and type of shares held by any individuals and/or group controlling more than one-fifth of the votes. Indicate relationship of such individuals and/or group to the company. If held by a holding company or other industrial enterprise, provide balance sheets, profit and loss statements, and capital structure information on such enterprises. If held by individuals, provide general and financial information on such individuals.

4. Outstanding debentures (term of issue and redemption, interest rate, etc.)

5. Outstanding mortgages and other long-term debt (terms of of issue and repayment, interest rate, etc.)

6. Bank borrowings. Give details of amounts owed, interest rates, terms, renewal arrangements and unused credit limits.

7. Pending litigation either by or against the company.

8. Contingent liabilities, guarantees or endorsements.

9. Method of valuation of inventories. Note any departure from stated procedure affecting past profits as shown in in attached statements.

10. Book value and estimated current market value of inventories for the past four years, adjusted to a comparable basis.

11. Give the book value of fixed assets for the past four years according to the following breakdown:

Book value of fixed assets at beginning of year (describe basis of valuation)

plus acquisitions during the year, at cost
minus retirements during the year, a book value
minus normal depreciation (state normal depreciation method and rates used by major categories of assets)
minus extraordinary depreciation or write-offs (or plus any shortfall below normal depreciation)
plus revaluation of fixed assets

Book value of fixed assets at end of year.

12. (a) Give the average annual amount written off on bad debts during the past four years;
(b) Give the total amount of claims overdue as of the date of the latest balance sheet and percentage of nominal value at which claims are recorded in the balance sheet.

ANNEX E

INDUSTRIAL OR COMMERCIAL PROJECT

FORECAST OF EARNINGS, RECEIPTS AND EXPENDITURES

	Present Operation			Construction Years			Operative Years					
	1959	1960	etc.	1962	1963	etc.	1964	1965	1966	1967	1968	etc.
A. EARNINGS FROM OPERATIONS												
Revenue (Separately for each major product or category of sales)												
1. Annual Sales (Units per year)												
2. Unit Sales Price												
3. Gross Revenue from Sales (1 x 2)												
4. Other Income (describe)												
5. Total Income (3 + 4)												
Cost of Operation, Net Income & Profit												
6. Operating Expenses:												
a. Manufacturing												
b. Maintenance												
c. General Administration												
d. Distribution & Marketing												
e. Short-term Interest												
7. Depreciation Allowances (Show basis)												
8. Taxes (describe)												
9. Total Cost of Operation before interest on Long-term Debt (6 thru 8)												
10. Net Income before Interest on Long-term Debt (5 - 9)												
11. Interest on Long-term Debt												
12. Net Profit (or Loss) (10 - 11)												
B. SOURCES OF FUNDS												
13. Net Income before Interest (Item 10)												
14. Depreciation Allowance (Item 7)												
15. Increase in Paid-in Share Capital												
16. Borrowings:												
a. Existing DLF or AID Loans)												
b. AID Loan proposed herein))												
c. Other Long-term borrowings) (show terms)												
(Each loan separately))												
d. Anticipated short-term loans)												
17. Other receipts (describe)												
18. Total Receipts (13 thru 17)												

	Present Operation			Construction Years			Operative Years					
	1959	1960	etc.	1962	1963	etc.	1964	1965	1966	1967	1968	etc.
C. USE OF FUNDS												
19. Construction Expenditures:												
a. This AID project												
- Foreign currency												
- Local Currency												
- Total, AID Project												
b. Other construction												
c. Total construction expenditures												
20. Current Assets (minimum expected) (See Annex C)												
21. Fixed, Intangible & other Assets (See Annex C)												
22. Debt Service:												
a. Amortization of Principal												
(1) Existing DLF or AID Loans												
(2) AID Loan proposed herein												
(3) Other borrowings												
b. Interest												
(1) Existing DLF or AID Loans												
(2) AID Loan proposed herein												
(3) Other borrowings												
23. Other expenditures (describe)												
24. Total Expenditures (19 thru 23)												
D. CASH FLOW												
25. Annual Cash Surplus (or Deficit) (Item 12)												
26. Cash to Reserves												
27. Cash to Dividends												
28. Cash Balance, End of Period (25 - 26 & 27)												
E. BALANCE SHEET, END OF PERIOD												
Assets												
29. Current Assets (See Annex C)												
30. Investments												
31. Capital Assets (See Annex C)												
32. Gross Assets (29 thru 31)												
33. Accumulated Depreciation												
34. Net Fixed Assets (32 - 33)												
35. Intangible Assets (See Annex C)												
36. Total Assets, end of period(34+35)												
Liabilities												
37. Current Liabilities (due within 1 year)												
38. Share Capital (authorized, issued, paid-in)												
39. Reserves (describe)												
40. Surplus: a. Re-evaluation surplus												
b. Earned Surplus or deficit												
41. Total Liabilities (37 thru 39 + or - 40)												

PRODUCTION COST

Cost per unit of output (pound, ton, thousand, etc.

based on ___ units per day or ___ units per year)

Item	Quantity Required per Unit	Price	Cost per Unit of Product
Labor (classes and rates)			
Raw materials (list)			
Power			
Fuel			
Utilities			
Supplies			
Supervisory and technical salaries (classes and rates)			
Other direct costs			
Total Direct Plant Cost			

SYSTEM REQUIREMENTS-POWER & ENERGY SOURCES

Calendar Years	Last Year of Record	For Minimum of 10 years by Year
A. SYSTEM DEMAND MW		
By substations, Areas or load centers		
TOTAL DEMAND, MW		
Demand Diversity Factor - %		
Coincidental Demand MW		
System Losses MW		
Net System Demand MW		
B. SYSTEM ENERGY, MWH		
By substations, Areas or load centers		
TOTAL MWH SALES		
Transmission & Distribution Losses, MWH		
Net MWH Supplied		
System Load factor %		
C. POWER SOURCES		
Show installed KW for each plant or other power source, to provide requirements (including reserves)		
Less Total Reserves, MW		
NET SYSTEM DEMAND, MW		
D. ENERGY SOURCES		
Show MWH supplied from each of above sources accounting for base load, peaking and standby requirements to equal requirements supplied		
NET MWH SUPPLIED		

CAPITAL COSTS

I. GENERATING STATION (DETAIL)

	Local Currency	Foreign Currency	Total
A. Land and Land Rights			
1. Site Purchase			
2. Survey & Plot Work			
3. Water Supply Exploration			
4. Relocations			
Subtotal, Land and Land Rights			
B. Structures and Improvements			
1. Foundation Investigation			
2. Site Preparation			
3. Sewers			
4. Fencing			
5. Building Substructure			
6. Building Superstructure			
7. Piling			
8. Structural Steel			
9. Material Testing			
10. Painting			
11. Landscaping			
Subtotal, Structures and Improvements			
C. Roads, Railroads and Bridges			
1. Roads			
2. Railroad Siding			
Subtotal, Roads, Railroads and Bridges			
D. Reservoirs, Dams and Waterways			
E. Mechanical			
1. Turbine Generator(s) Erected			
2. Surface Condenser(s) Erected (_____ sq. ft.)			
3. Intake Structure			
4. Traveling Screens (No. ____)			

	Local Currency	Foreign Currency	Total
5. Circulating Pumps (No. ____)			
6. Cooling Tower			
7. Deaerating Feedwater Heater(s)			
8. Closed Feedwater Heater(s)			
9. Evaporator(s)			
10. Steam Generator(s) Erected (_____ M#/hr) 4 hour rating			
11. Chimney(s)			
12. Coal Handling			
13. Ash Handling			
14. Fuel Oil Pumping & Heating Equipment			
15. Boiler Feed Pumps (No. _____)			
16. Controls and Instruments			
17. Piping			
18. Thermal Insulation			
19. Water Treating Equipment			
20. Miscellaneous Pumps			
21. Air Compressors (No. ____)			
22. Water Wells and Pumps			
23. Elevated Water Tank (_____ Gal.)			
24. Fuel Oil Storage Tank (_____ Gal.)			
25. Turbine Room Crane (_____ Ton)			
26. Machinery Erection			
Subtotal, Mechanical			
F. Electrical			
1. Electrical Control Board (No. of Panels ___)			
2. Switchgear (Including Load Centers)			
3. Conduit, Cable, Electrical Installation			
Subtotal, Electrical			
G. Step-Up Substation			
1. Power Transformers (Size _____)			
2. Oil Circuit Breakers (No. ___) (____KV)			
3. Substation Structure (No. of Bays ____)			
Subtotal, Step-Up Substations			
TOTAL			
H. Engineering _____%			
TOTAL			

	Local Currency	Foreign Currency	Total
I. Overhead _____%			
TOTAL			
J. Interest During Construction ___% (Estimated Construction Time ___Mos.)			
K. Contingencies			
GRAND TOTAL			
$/KW Nameplate _____			
II. TOTAL PROJECT			
A. Investment-Proposed Facilities			
1. Generating Plant (Each station separately if more than one)			
a) Land and Land rights			
b) Structures and improvements			
c) Roads, railroads, bridges			
d) Reservoirs, dams, waterways			
e) Mechanical			
f) Electrical			
g) Plant Step-up Substation			
h) Tools and shop equipment			
Subtotal, Generation			
2. Transmission (Show each voltage class separately)			
a) Right of way procurement and clearing			
b) Material			
c) Labor			
Subtotal, Transmission			
3. Substations			
a) Material and hardware			
b) Transformers			
c) Breakers and switching			

	Local Currency	Foreign Currency	Total
d) Labor			
e) Site procurement			
Subtotal, Substations			
4. Distribution			
a) Transformers, meters, etc.			
b) New lines and connections			
c) Other system improvements			
d) Right of way			
Subtotal, Distribution			
5. Civil works			
6. Communications			
7. Working capital			
8. Interest during construction			
10. Legal			
11. Engineering			
12. Tools, vehicles			
13. Taxes and fees			
14. Training			
Total Investment (Proposed facilities)			

B. Investment, Existing Facilities	How Financed	Amount
1. Generating Plant (each plant separately)		
2. Transmission (each voltage class)		
3. Substations (list each substation)		
4. Distribution (by project)		
5. Other investment in power system		
Total Investment (Existing facilities)		

C. Future Investments	Amount	Year Required
1. Generation		
2. Transmission		
3. Substations		
4. Distribution System		

ANNUAL PRODUCTION COSTS
(Proposed Facilities)

	First Year's Operation	Year Facility Fully Utilized
Plant Capability, MW		
Station Usage %		
Net Station Heat Rate, BTU/KWH		
Gross Generation MWH		
Net Generation MWH		
Production Expenses		
Direct Production Expense		
Operating Labor and Supervision		
Operating Supplies & Equipment		
Maintenance Labor & Expenses		
Maintenance Material		
Fuel		
Other, explain	_____	_____
Sub-total		
Indirect Production Expenses		
Replacement		
Depreciation (not included in maintenance)		
Interest		
Taxes		
Insurance		
Other, explain	_____	_____
Sub-total	_____	_____
Total Production Expense		

	First Year's Operation	Year Facility Fully Utilized
Transmission Expenses		
O&M (by voltage class and circuit)		
O&M, Step down substations		
Taxes		
Insurance		
Depreciation		
Interest		
Replacement (not included in O&M)		
Other, explain		
Sub-total		
Distribution Expenses (same breakdown as Transmission)		
Sub-total		
General Plant Expenses		
Depreciation		
Interest		
Inventories and Spare Parts		
Replacement		
Administrative & General		
Taxes		
Insurance		
Other, explain		
Sub-total		
Total Cost		
Unit Cost/KWH		

BALANCE SHEET

Attach comparative balance sheets for past five years broken down as follows:

Assets

1. Current Assets:
   a. Cash
   b. Marketable Securities
   c. Notes Receivable (show separately amounts owed by subsidiaries; directors, shareholders, their families or agents; all other amounts other than normal commercial debts)
   d. Accounts Receivable from Customers
   e. Inventories
      -Supplies and Material
      -Fuel
   f. Other Assets (describe)

2. Investments:
   a. In subsidiaries
   b. Other (describe)

3. Fixed Assets:
   a. Production Plant
   b. Transmission Plant
   c. Substations
   d. Distribution Plant
   e. General Plant
   f. Construction in Progress
   g. Other (describe)

4. Gross Assets (1 thru 3)

5. Depreciation Reserves

6. Net Fixed Assets (4 - 5)

7. Intangibles (patents, licenses, goodwill, trademarks, formulas, franchises, etc.)

8. Other Assets (specify)

9. Total Assets (6 thru 8)

Liabilities

10. Current Liabilities (due within one year)
    a. Notes Payable
        -to banks or other short-term lending agencies
        -to holders of long-term debt maturing within one year
        -to directors, shareholders, their families and agents
    b. Accounts Payable to commercial creditors
    c. Contractors' bid and performance bonds
    d. Other (describe)

11. Long-term Debt (over one year) (indicate terms)

12. Construction Costs Payable

Capital and Surplus

13. Capital (authorized, issued and Paid-in)

14. Reserves (describe)

15. Surplus:
    a. Revaluation surplus
    b. Earned Surplus or Deficit
    c. Net Surplus or Deficit

16. Total Liabilities and Capital (10 thru 14 minus or plus 15)

ANNEX K
ELECTRIC POWER PROJECT

FINANCIAL PROJECTION

A. EARNINGS FROM OPERATIONS

Revenue (show separately revenue from each major category of sales)

1. Annual sales (KWH per year)
2. Unit sales price
3. Gross revenue from sales (1 x 2)
4. Other income (describe)
5. Total income (3 + 4)

Cost of Production

6. Operating expenses:
   a. Plant operation
   b. Plant maintenance
   c. Fuel
   d. Operating supplies
   e. Other
   f. Total operating expenses
7. Fixed charges:
   a. Depreciation
   b. Taxes
   c. Insurance
   d. General administration
   e. Total fixed charges (before interest)
8. Total production cost (6 + 7)

Profit and Loss

9. Net income before interest (5 - 8)
10. Interest
11. Net Profit or Loss (9 - 10)

B. RECEIPTS

12. Net income before interest (Item 9)
13. Depreciation allowance (Item 7a)
14. Increase in paid-in share capital
15. Borrowings:
    a. Existing DLF or AID loans)
    b. AID loan proposed herein)
    c. Other long-term borrowings) give terms
       (each loan separately))
    d. Anticipated short-term loans)
16. Other receipts (describe)
17. Total receipts (12 through 16)

C. EXPENDITURES

18. Construction expenditures:
    - a. This AID Project)
    - b. Other construction) (broken down into foreign
    - c. Total) and local currencies)
19. Current assets (minimum expected) (see Annex J)
20. Fixed, intangible and other assets (see Annex J)
21. Debt service: a. Amortization of principal
    - (1) Existing DLF and AID loans)
    - (2) AID loan proposed herein)
    - (3) Other borrowings) foreign
    - b. Interest) and
    - (1) Existing DLF or AID loans) local
    - (2) AID loan proposed herein) currencies
    - (3) Other borrowings)
22. Other expenditures (describe)
23. Total expenditures (18 through 22)

D. CASH FLOW

24. Annual cash surplus (Item 11)
25. Cash to reserve
26. Surplus reserved for special purposes (describe)
27. Dividends
28. Unallocated balance to earned surplus (24 minus 25 to 27)

E. BALANCE SHEET, END OF PERIOD

Assets

29. Current assets (see Annex J)
30. Investments
31. Capital assets (see Annex J)
32. Gross assets (29 through 31)
33. Accumulated depreciation
34. Net fixed assets (32 - 33)
35. Intangible assets (see Annex J)
36. Total assets end of period (34 + 35)

F. LIABILITIES

37. Current liabilities (due within one year)
38. Share capital (authorized issued and paid-in)
39. Reserves (describe)
40. Surplus: a. Revaluation surplus
    - b. Earned surplus or deficit
41. Total liabilities (37 through 39 plus or minus 40)

BENEFIT - COST SUMMARY
HYDRO PROJECT

	Hydro Project	Alternative Source
Location (s)		
Plant Capacity, KW	_____	_____
Investment in facilities (1)	_____	_____
Capacity delivered to load center (s) KW	_____	_____
Energy delivered to load center(s) KWH	(2)	(2)
Energy generated, annual, KWH	(2)	(2)
	_____	_____
Annual Expenses (1)		
Depreciation	_____	_____
Interest	_____	_____
Insurance	_____	_____
Taxes	_____	_____
Administrative and General	_____	_____
Interim Replacements	_____	_____
Operation and Maintenance	_____	_____
Fuel	_____	_____
	_____	_____
Total Annual Cost		

$$\frac{\text{Annual Cost of Alternative Source}}{\text{Annual Cost of Hydro Project}} = \frac{\text{Benefit}}{\text{Cost}} \text{ Ratio} = _____ \text{ to 1.}$$

Notes:

(1) Include transmission and substation if needed to deliver power to the load centers.

(2) Should be the same for Hydro Project and Alternative Source(s).

COMPUTATION OF BENEFITS TO LANDOWNERS

(See Section 8, Circular No. A-47, Annex B)

		Dollars
Production at present:		
Gross agricultural yield	_____	
Less farm input costs, itemizing farm labor, power, fertilizer, seeds, fuel, materials, tools, pest control, taxes, insurance, etc.	_____	
Net present agricultural yield		_____
Estimated production after completion of project:		
Gross agricultural yield	_____	
Less farm input costs, as above	_____	
Net agricultural yield, after		_____
Gain in net agricultural yield		_____
Gain as reduced for lag in accrual	_____	
Less amortization of associated on-farm costs such as leveling, ditches, etc.	_____	
Less annual maintenance and operation of associated facilities	_____	
Plus any gains such as reduction in charges for maintenance and operation of main system	_____	
Annual Net Benefit to Landowners		_____