



Brown & Root, Inc.

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REPÚBLICA DE COLOMBIA

DESPACHO

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July 3, 1996

MINISTERIO DEL MEDIO
AMBIENTE

Hon. José Vicente Mogollón
Ministerio del Medio Ambiente
Despacho del Ministro
República de Colombia
Calle 16 No. 6-66, Piso 3ero.
Edificio Avianca
Santafé de Bogotá
COLOMBIA

RE: PROJECT ASSESSMENT AND FEASIBILITY STUDY
FOR CANAL DEL DIQUE LOCKS AND SALTWATER
BARRIER PROJECT

Dear Ministro Mogollón:

I was pleased to hear from you last week and I hope the information furnished herein meets your needs. I have attached a detailed description of basic activities and tasks included in the project and a preliminary schedule.

Brown & Root, Inc. can provide the services outlined herein subject to negotiation of mutually acceptable terms and conditions, and we look forward to discussing this project further with you and other appropriate entities in the future.

Sincerely,

BROWN & ROOT, INC.

Dorian French, P.E., R.P.L.S.
Engineering Manager
Environmental/Water Resources
Civil Engineering Department

DF/sp/kre

Enclosure

cc: W. W. Morris
Jim McGlothlin
Joseph Sunseri

Canal del Dique Lock and Salt Water Barrier Project

PHASE I - Project Assessment

The Project Assessment is the initial scoping document which will define:

- The major components of the proposed Canal del Dique Lock and Salt Water Barrier Project
- The critical environmental issues such as:
 - ◆ siltation of the Bays of Cartagena and Barbacoa
 - ◆ saltwater intrusion and dry season water requirements
 - ◆ coral reef viability
 - ◆ water supply for Cartagena and other cities dependent on the Canal Del Dique
- The important regulatory, political, or social factors important to the project

The Project Assessment will include product demand and revenue forecasts/economic analyses and preliminary cost estimates for project implementation. Extensive use will be made of prior studies and engineering by the executing agency and its consultants. After an initial review of prior studies, a site inspection will be conducted, and key personnel from the executing agency and other critical interest groups and regulatory agencies will be contacted to discuss critical issues, overall project needs, and system operation and design criteria. Specific tasks in the Project Assessment will include the following:

Task 1.0 *Research and Investigation*

- 1.1 Review existing data and reports relating to the proposed Canal del Dique Lock and Salt Water Barrier Project, including any planning and environmental reports, cost estimates, and preliminary design calculations prepared by the executing agency and its consultants or by any other agencies.
- 1.2 Establish a document control system for all data, maps, drawings, and reports pertaining to the proposed project.
- 1.3 Conduct a preliminary site inspection of any existing facilities and the surrounding area likely to be impacted by the locks and saltwater barrier project.

- 1.4. Meet with key personnel from the executing agency's operating, engineering, finance and/or administrative divisions to discuss issues related to the proposed locks and saltwater barrier project.
- 1.5 Meet with regulatory agencies, key organizations, and community groups with interest and/or control over any regulatory or political approval process in order to identify concerns and issues.

Task 2.0 *Preliminary Engineering and Environmental Studies*

- 2.1 Evaluate existing and proposed land use in the vicinity of the proposed locks and salt water barrier project. Identify environmentally sensitive areas and issues, including any fatal flaws, to be addressed during the design process.
- 2.2 Evaluate alternatives to the proposed project based on sensitive areas, engineering, and land use constraints, project objectives, funding issues, or other relevant parameters. Select potential alternatives for further study.
- 2.3 Conduct a preliminary analysis of the proposed locks and saltwater barrier project under various conditions to identify optimum facilities' requirements. Identify critical engineering issues to be addressed during the feasibility phase.
- 2.4 Prepare conceptual drawings of the proposed facilities, as required and deemed appropriate, for preliminary financing negotiations.

Task 3.0 *Preliminary Cost Estimates and Financial Analysis*

- 3.1 Prepare preliminary cost estimates for the proposed facilities including capital construction costs, operating and maintenance costs, land acquisition, and permitting, environmental mitigation, engineering, and financing or other related costs, as required.
- 3.2 Estimate total project costs by establishing allowances for contingencies, interest costs during the construction period, inflation, or other risk factors to be added to the cost estimate for the selected project.
- 3.3 Develop revenue estimates based on various operating scenarios and conduct sensitivity analyses on key parameters.
- 3.4 Identify potential funding sources (local and international) and determine the appropriate financial conditions required to secure funding.

Task 4.0 *Project Assessment Report*

- 4.1 Prepare a concise report summarizing the results of the preliminary engineering and environmental studies including anticipated impacts, mitigation efforts needed, cost estimates, and schematic drawings.
- 4.2 Meet with appropriate agencies, organizations, and financial institutions to review the results of the Project Assessment.

PHASE II - Engineering and Environmental Feasibility Study

In the Engineering and Environmental Feasibility Study phase, detailed engineering and environmental studies are conducted to establish the feasibility of implementing the proposed Canal del Dique Lock and Salt Water Barrier Project as defined and planned in the Project Assessment phase. A comprehensive environmental assessment of potential impacts and corresponding mitigation measures is conducted in conformance with local environmental regulations. If required, the environmental guidelines of any major lending institution will also be incorporated into the project. Socio-economic issues are addressed as required by the lender(s) and key political and stakeholder interests. Additional field work is conducted using personnel from the executing agency or its local consultants, as required, to fill gaps in the existing data. Preliminary designs of major facilities are prepared to establish final design criteria and optimize the execution and operations phases. Specific tasks in the Engineering and Environmental Feasibility Study include the following:

Task 5.0 *Field Surveys*

- 5.1 Based on the results of the Project Profile, determine the need for additional field surveys including, but not limited to, topographic, geotechnical, archeological, hydrological, ecological, or product demand surveys.
- 5.2 Develop work plans for additional fieldwork, as required, and enter into subcontracts with appropriate local consultants to conduct the work.

Task 6.0 Detailed Engineering Studies

- 6.1 Conduct detailed analyses to determine the optimal system design, including, as appropriate:
- alternative lock and salt water barrier site options.
 - phasing and staging considerations.
 - maintaining traffic during construction.
 - seasonal hydrologic analysis.
 - dry season flow augmentation alternatives.
 - hydrologic and hydraulic modeling.
 - interaction with any existing facilities.
- 6.2 Evaluate alternative construction materials for proposed facilities to optimize the life of the system.
- 6.3 Evaluate constructability and system operational performance under varying conditions.
- 6.4 Define parameters for final design.

Task 7.0 Detailed Environmental Assessment

- 7.1 Review appropriate local, state, and national environmental regulations.
- 7.2 Identify potential environmental impacts during construction.
- 7.3 Review preferred and alternative site locations, site layout, and operating requirements.
- 7.4 Identify potential long- and short-term, direct and indirect environmental impacts including but not limited to:
- siltation of the Bays of Cartagena and Barbacoa
 - saltwater intrusion and dry season water requirements
 - coral reef viability
 - water supply for Cartagena and other cities dependent on the Canal Del Dique
- 7.5 Identify appropriate mitigation measures.

Task 8.0 *Project Financing Plan*

- 8.1 Prepare total life-cycle costs (construction, operation and maintenance) for each proposed facility and for proposed system as a whole.
- 8.2 Prepare a proposed schedule of investments and disbursements for all proposed facilities.
- 8.3 Prepare economic and financial analyses required by the appropriate lending institution or investors.
- 8.4 Determine the best project content based on identified funding options and recommend an optimum financing plan for the project.

Task 9.0 *Project Execution Plan*

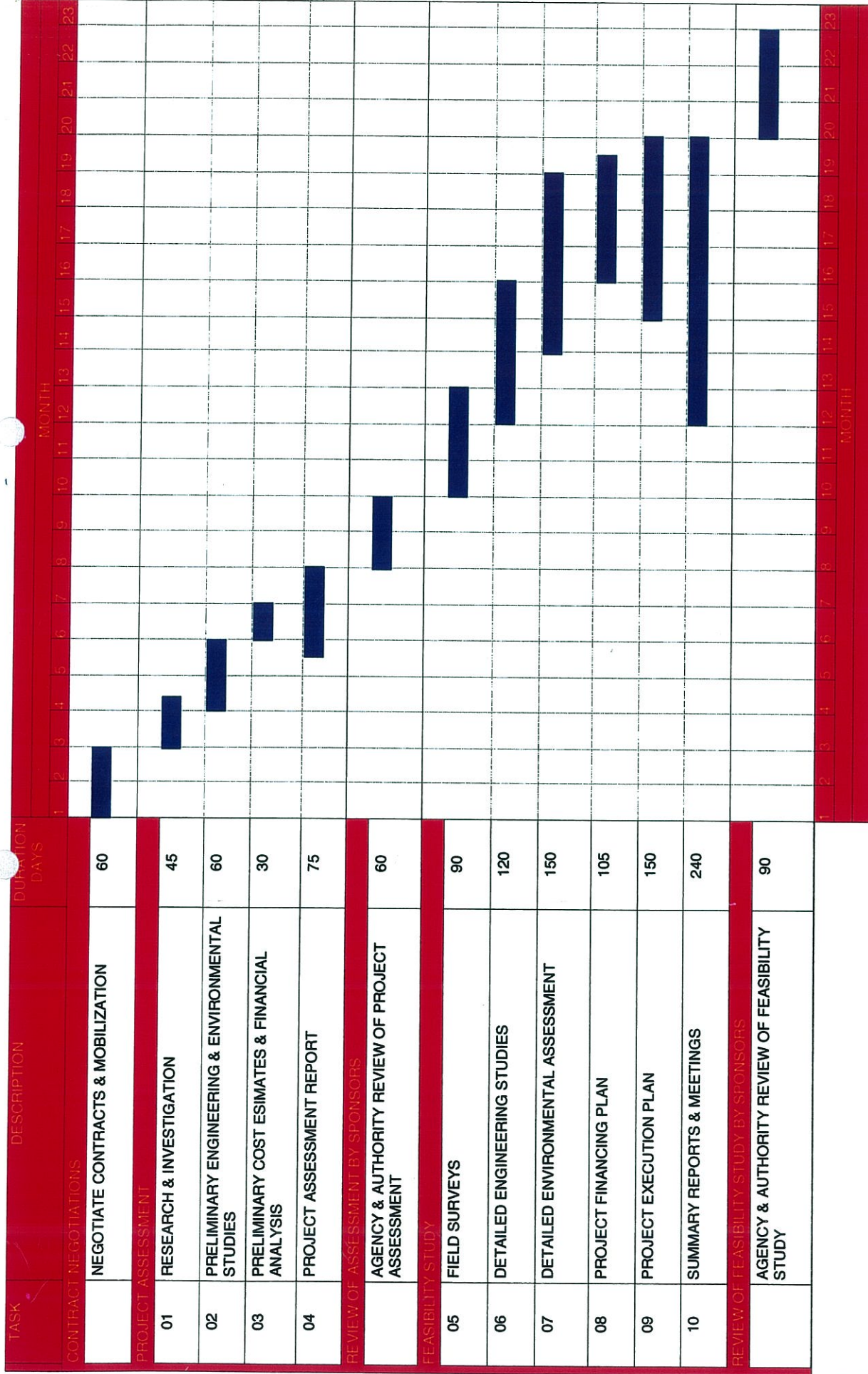
- 9.1 Prepare schedules for final design, construction documents, procurement, and major construction activities for the proposed projects.
- 9.2 Prepare recommended procurement packages.
- 9.3 Determine the scope for professional services during design and construction and develop a staffing plan.
- 9.4 Prepare preliminary construction execution plans including staffing plan, material and equipment delivery plan, employee housing and transportation plan, preliminary Q/A plan, and preliminary safety plan.

Task 10.0 *Summary Reports and Meetings*

- 10.1 Prepare draft reports summarizing the results of the analyses described above. Distribute the reports to the executing agency and appropriate governmental agencies for review and comment.
- 10.2 Organize and prepare slides, maps, and charts to support presentations to the management of the executing agency and regulatory staffs and, as required, to the public and specified interest groups.
- 10.3 Summarize the results and conclusions of the various feasibility study tasks into a single summary document. Incorporate comments and make necessary revisions for a final report for submittal to the lender.
- 10.4 Meet on a regular scheduled basis with representatives of the executing agency to discuss engineering analyses, select design alternatives, and

recommend actions related to the project. It is expected that review meetings will be scheduled at least monthly.

- 10.5 Prepare progress reports, meeting minutes, and other documents to provide the executing agency with up-to-date information on the status of the work activities and overall project status. Coordinate and document all project communications.



CANAL DEL DIQUE LOCKS AND SALT WATER BARRIER PROJECT

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 Company name BROWN & ROOT, INC
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Post Office Box 3
Houston, TX 77001-0003

TO:	Ministerio del Medio Ambiente Despacho del Ministro Republica de Columbia Calle 16 No. 6-66, Pisco 3ero. Edificio Avianca Santafe de Bogota Colombia	DATE:	July 16, 1996
		JOB:	PG-4371
		FILE:	Reading File - Outgoing
ATTN:	Hon. Jose Vicente Mogollon	FAX NO.:	011-571-336-2011
RE:	Project Assessment Canal del Dique Colombia		

WE ARE SENDING YOU THE FOLLOWING ITEMS:

☒ Attached
☐ Under Separate Cover Via _____

☐ Shop Drawings ☐ Prints ☐ Plans ☐ Specifications
☐ Copy of Letter ☐ Change Order ☐ Samples ☒ See List Below


COPIES	DESCRIPTION
1	Project Assessment Letter and Attachments

THESE ARE TRANSMITTED as checked below:

<input type="checkbox"/> For Approval	<input type="checkbox"/> For Review and Comment
<input checked="" type="checkbox"/> For Your Use	<input type="checkbox"/> For Your Information
<input type="checkbox"/> As Requested	<input type="checkbox"/> Return

REMARKS: Following is the letter and attachments that are being delivered to you today by DHL.

COPY TO: _____

SIGNED: 
Dorian French
Engineering Project Manager