DRAFT

GUYANA

COASTAL FLOOD PROTECTION PROGRAM
(GY-Ls/n)

HIRING OF AN INTERNATIONAL CONSULTANT TO SUPPORT PROJECT PREPARATION

TERMS OF REFERENCE

I. BACKGROUND

1.1 Since early December 2005 and into the end of January 2006, Guyana experienced unusual high intensity rainfall; reaching rainfall levels of 25.4 centimeters per day in the coastal areas. The result of the high rainfall was overflow of many of the rivers and rising levels in the conservancies that irrigate and protect major urban and agriculture areas in the coastal plain. Flooding began in the Mahaicony area (Region 5) in early December and since then has become widespread, overwhelming drainage and flood control mechanisms along the coastal plain, affecting Regions 2, 3, 4, 5, and 6, but heavily affecting Regions 2 and 5, which were not severely affected by the 2005 floods. Thousands of residents in these areas have suffered and endured disruption and loss of their livelihoods.

1.2 Hardest hit by the flooding was the District of East Demerera. This area occupies the lands from the coast south to Linden and contains a water conservancy of some 225 sq. miles. A dam that extends roughly from the west at the Demerara River to the east near the Mahaica River retains the conservancy. Approximately 36 miles in length, the dam lies about 10 miles south of the coast. It runs roughly parallel to the coast and includes an extensive drainage network extending to the Demerara and Mahaica rivers as well as to water control structures along the coast.

1.3 The coastal areas are protected by an extensive seawall structure with a system of water control structures and pumps for discharging accumulated waters to the sea. Guyana has a semi-diurnal tide and much of the land in the region behind the seawall is below the mean high water level (MHWL). Gravity drainages are operable only during the two low tide cycles that allows for approximately 4 to 6 hours of release time depending n the lunar tidal cycle.

1.4 The conservancy operates to provide 2 services. The first is to de-water coastal lands for agriculture and development activities. These soils are particularly fertile as they are the fluvial deposits of 2 river systems. The second function is to provide irrigation water during the dry seasons. This is primarily to support the 2 of the three major export crops for the country, sugar cane and rice. There are two

rainy seasons in Guyana, which occur during the months December/January and May/June. The May/June period is typically the wetter of the two seasons. Two rainfall seasons coupled with the near equatorial location of the country provides for two planting seasons annually for both rice and cane and allows Guyana to maintain its competitive position in these agricultural markets.

1.5 The system of canals and conservancy was originally built by colonists, with slave labor, some 180 years ago. As originally designed, the water management system was entirely gravity based and timed locally with the semi-diurnal tide cycle. Over the years, modifications to the system have changed the basic operation of the conservancy drainage network. Canals have filled in, water control structures have fallen into disrepair, and local modifications to the drainage infrastructure have changed the hydrodynamics of the system. Outlets to the Demerara and Mahaica rivers as well as to the sea are in disrepair or are not functional.

1.6 Water levels within the conservancy are critical to the safety of the system. When measured against Guyanan Vertical Datum (in feet), 59 feet has been identified as a failure threshold. During the floods of January 2005 an UNDAC team of engineers observed the following:

"At the time of the inspection (Feb 6th) the water level was 58.40 G.D. (*feet*). If the water level rises up to 59 G.D. the overtopping will go out of control. This will result in numerous breaches and the release of in the order of 100 billion gallons of water into the coastal zone. This will bring a water layer of around 2 feet in the area from Georgetown to Mahaica River. The disaster will be far worse than the current flood situation."

1.7 During the progression of the flood event of 2004-2005, water levels within the conservancy rose from approximately 56.25 to nearly 59 feet G.D. Presented in table 1, as the water levels approached 59 feet there was some over-topping of the dam that was controlled by emergency crews. This coupled with the high water levels stressed the dam, weakening the structure in various locations.

1.8 In early February 2006, the country was under threat of further floods since the level of the East Demerara Water Conservancy (an earthen dam) is 58.05 Georgetown Datum (GD) at Flagstaff, 58 GD at Lama, 55.07 GD at Land of Canaan and 56 GD in the Mahaica Creek. Around 59 GD would be the danger level and this figure was already reached at the eastern part of the conservancy but not across all of it. Over 59 GD water would overtop the conservancy dam, a situation that could lead to the erosion of the dam and inundation of the whole enpoldered area. Initial assessments point at this overflow as one of the contributing causes of the floods in Region 5, which lies to the east of the East Demerara Conservancy.

1.9 As a result of the recent flooding, numerous system weaknesses have been identified. However, many relate to the development of lands below the dam and the need for long-term improvements to the conservancy structures. Emphasis is particularly on the strengthening of the dam and the rehabilitation and re-design of low land drainage networks.

1.10 Recent flood events in 2005 and 2006 underscore the need for greater focus on long-term sustainable and resilient measures. These measures might include the preparation of a comprehensive natural disaster management and mitigation plan. The preparation of a Coastal Flood Protection Program for Guyana is a first and necessary step in this direction.

II. REPORTS TO BE REVIEWED BY THE CONSULTANT

2.1 The Bank's country office in Guyana (CGY) has a set of reports available regarding flood events in Guyana. These reports are to be reviewed by the Consultant. Additionally, upon the consultant's arrival to Georgetown, the Consultant will participate in meetings with Government of Guyana's agencies to collect additional information regarding the current situation of the conservancies and drainage and irrigation infrastructure used for both irrigation and flood control in the coastal areas of Guyana. The following reports are already available at CGY:

a. Mott MacDonald, "Final Report of the Special Advisor to the Government of Guyana. Task Force for Infrastructure Recovery", July 2005

b. Mott MacDonald, "Infrastructure Rehabilitation – Short to Medium Term Plan. Government of Guyana. Task Force for Infrastructure Recovery", 12 July 2005

c. Mott MacDonald, "Guyana Drainage and Irrigation Systems Rehabilitation Project – Institutional & Financial Sustainability Report", July 2004.

d. World Bank, "Guyana: Preliminary Damage and Needs Assessment Following the Intense Flood of January 2005"

e. Mott MacDonald "Report by Dams Specialist", 2005.

f. Mott MacDonald "East Demerara and Boereserie Conservancy Dams Conditions by Dams Specialist", April 2005.

g. Inter-American Development Bank "Agricultural Support Services – Project Report", 2004.

h. Inter-American Development Bank, Engineering Designs for ASSP civil works in D&I Systems in Regions 3, 4, and 6.

i. Inter-American Development Bank "Agricultural Recovery Assessment from the 2005 Flooding. Mission Report", March 7-18, 2005.

III. CONSULTANCY OBJECTIVES

3.1 The objective of the consultancy is to provide technical support to the Project Team during the preparation of the Coastal Flood Protection Program in Guyana.

IV. CHARACTERISTICS OF THE CONSULTANCY

4.1 Type of consultancy: International Individual Consultant – Lump Sum. The payment schedule is presented on Chapter V of these Terms of Reference.

4.2 Starting date and duration: The consultant will work for a total of 60 (sixty) days, will start on March 12, 2006 and will end on March 31, 2007.

4.3 Place of work: The consultant will work in: (i) his home office; (ii) in Washington, DC; and (iii) in Georgetown, Guyana. The consultant will make seven trips: (i) two round trips from his place of residence to Washington, DC; and (ii) five round trips from his place of residence to Georgetown, Guyana. In case that other trips are required, and authorized by the Bank, the consultant will be reimbursed by the expenses incurred according to the applicable Bank policies on travel. The Country Office in Guyana will provide the logistical support for the land travel required in Guyana.

4.4 Air travel and perdiens: The estimated total of expenses with air travel and perdiens is as follows:

- 2 (two) round trips from his place of residence to Washington, DC.
- 5 (five) round trips from his place of residence to Georgetown, GY.
- 4 (four) perdiens in Washington, DC.
- 30 (thirty) perdiens in Georgetown, Guyana.

4.5 Qualifications: Graduated in Sciences or Engineering with a graduate degree in Hydraulics, or Water Resources Engineering, with more than 15 years of experience in design of flood control projects in coastal areas, including the proper consideration of the socioeconomic and environmental aspects.

V. ACTIVITIES

5.1 The activities for this consultancy are described below:

a. Review of all pertinent technical information related to the recurrent flood problems particularly within the following coastal administrative regions: (i) Poomeroon-Supernaam; (ii) Essequibo Islands-West Demerara, (iii) Demerara

- Mahaica, (iv) Mahaica-Berbice, and (v) East Berbice-Corentyne. The Bank will provide the consultant no later than 5 working days before the start of the work, with electronic copies of 3 reports that are considered very important to have an overall view of the existing problems.

b. Initial mission to Guyana to visit all problem areas and structures, discuss with IDB's Project Team and personnel from the Country Office, all major issues, and to collect additional relevant information available. Participate in meetings with national authorities and experts from other donor agencies to discuss possible alternatives to reduce the current vulnerabilities within the framework of a long term flood control program.

c. Carry out technical assessments and prepare recommendations and cost estimates regarding the project.

d. Prepare detailed terms of reference (DTOR) for the preparation of the required feasibility studies (technical, economic, and environmental) to support the preparation of a Bank loan aimed at addressing the main issues identified. The DTOR should include among others, the following aspects:

- Requirements of the Bank's environmental and social policies (including disclosure of information) as applicable to the preparation of this type of project. It is expected that a full fledge EIA will be required for Program.

- Primary information (field data) that is considered indispensable for the completion of the feasibility studies with the required quality.

- The DTOR should require that the technical proposals prepared by the bidders include a detailed description of all tasks involved in the preparation of the feasibility studies, specifying the name(s) of the expert(s) proposed to do it, the number of hours/weeks required from each expert, a timetable of preparation showing the inter-relation between different tasks. A model form to be filled by the bidders should be provided in the DTOR. This is very important for an adequate evaluation of proposals.

- The DTOR should include a profile of the required technical team (as a minimum), specifying the level of seniority and specialization required from each expert.

d. Prepare a draft version of the Project Concept Document (PCD) for the Coastal Flood Control Program, according to the Bank requeriments.

e. Participate in two meetings with the Project Team in Washington DC, to discuss the strategy to be adopted during project preparation, and eventual problems encountered.

f. Participate in five missions to Guyana to support the Project Team in the preparation and analysis of the project, and to supervise the work being carried out by the local counterpart and its consultants.

g. Provide technical advice to the Project Team and national authorities regarding the major issues involved in project preparation and execution.

h. Prepare a draft version of the Project Report according to the the Bank requeriments..

i. Provide support to the Project Team to address all issues raised by Bank's Committees.

VI. REPORTS

A. Reports

6.1 For payment purposes, the consultant will deliver to the Bank three Reports presenting the results and conclusions of the work carried out.

a. The first Report will include the following activities and products: (i) Mission Report with a preliminary analisis of the documents reviewed; (ii) detailed Terms of Reference for the any studies that should be carried out for project preparation (i.e., feasibility studies, EIA, etc.).

b. The Second Report will include the following activities and products: (i) Summary of the activities carried out during the period, particularly regarding the quality of the work being done by the executing agengy and its contractors, including recommendations and conclusions; and (ii) draft version of the Project Concept Document (PCD).

c. The Third and Final Report will include the following activities and products: (i) Summary of the activities carried out during the period, particularly regarding the quality of the work done by the executing agengy and its contractors, including recommendations and conclusions; and (ii) draft of the Project Report.

d. At the end of each mission to Guyana the Consultant should prepare a concise Mission Report (no more than 5 pages), which would be included later in the three main reports described above.

B. Payment Schedule

6.2 The consultant will be paid according to the following schedule:

a. 20% upon signing of the Contract.

b. 20% upon delivery and acceptance by the Bank of the First Report.

c. 20% upon delivery and acceptance by the Bank of the Second Report .

d. 30% upon delivery and acceptance of the Third and Final Report.

e. 10% upon the approval of the Third Report and Final Report.

VII. COORDINATION

7.1 The consultant will work under the technical coordination of Mr. Luis Miglino, Senior Environmental Specialist (RE3/EN3). During the consultant's missions to Guyana, the person of contact will be Mr. Javier Grau Benaiges, Sector Specialist (COF/CGY).