



**TERMS OF REFERENCE  
FOR ATTRACTING AN INTERNATIONAL ENGINEERING FIRM WITH THE  
CAPACITY TO  
DESIGN, CONSTRUCT AND COMMISSION AN ENVIRONMENTALLY  
RESPONSIBLE GOLD MINING PROCESSING FACILITY/ PLANT IN THE DISTRICT OF  
BROKOPONDO, SURINAME**

<b>Project Title:</b>	Improving Environmental Management in the Mining Sector of Suriname, with Emphasis on Artisanal and Small-Scale Gold Mining (ASGM), EMSAGS Project
<b>Duration:</b>	6 months
<b>Location:</b>	Home based and District Brokopondo, Suriname
<b>Supervisor:</b>	Project Coordinator EMSAGS project
<b>Source of Funding:</b>	Global Environment Facility (GEF)/ UNDP

## 1. Background

The Project *“Improving Environmental Management in the Mining Sector of Suriname, with Emphasis on Artisanal and Small-Scale Gold Mining”*, (EMSAGS Project) is a GEF funded project being implemented in Suriname by the Ministry of Natural Resources and the National Environmental Authority (NMA) as national implementing partners, the Ministry of Spatial Planning and Environment as Beneficiary and with support from the United Nations Development Programme (UNDP). A Project Management Unit (PMU) is responsible for the day-to-day management of the project execution.

The project seeks to improve the environmental management of mining in Suriname, particularly small-scale gold mining. To do so, the project works at the policy level with government stakeholders, as well as with miners themselves to demonstrate the environmental and economic benefits of environmentally responsible mining practices (ERMPs) and technologies. The uptake of ERMPs will be promoted to reduce the negative effects of current practices on biodiversity, forest and local communities, while reducing greenhouse gas emissions.



A result of the uptake of environmentally responsible artisanal and small-scale gold mining practices, is to establish Mining Training and Extension Centers (MTECs). The MTECs proposed in this project are foreseen as an innovative approach to circumvent past challenges in transferring technology to small scale miners.

The first MTEC is the MTEC Brokopondo and is located at Brownsweg, a central and accessible location. The project's second MTEC is currently being set up at Snesi Kondre, as a demonstration hub for environmentally responsible mining technology intended for small-scale gold miners.

In November 2022, the EMSAGS Project entered into a partnership with WWF Guianas/ Alliance for Responsible Mining (ARM), which organizations were engaged in the implementation of the "Mercury phase-out project in the Guianas" a project executed simultaneously in Suriname and Guyana, seeking to motivate ASGM to switch to mercury-free mining methods. The partnership included the joint set up of pilot sites for ERMP in Brokopondo. The first site to be set-up was at Compagniekreek, whereby EMSAGS was responsible for the procurement of the mercury-free processing unit selected and ARM was in charge of managing the logistics and installation of the mercury-free processing unit in the field. In December 2023 all equipment was in country. During Jan- Feb. 2024 the pilot site was set up at Compagniekreek and in April 2024 the official commissioning of the site took place. The "Mercury phase-out project in the Guianas" has been finalized by WWF and the partnership between EMSAGS and WWF/ ARM has come to an end. As the end of the Mercury phase-out project meant no presence of ARM at the site, including no oversight of the installed equipment and the risk of flooding of the equipment- on the advice of ARM-, the pilot plant was decommissioned end May/ early June 2024.

The EMSAGS Project is currently planning the set-up of a second demonstration plant in Brokopondo, possibly in partnership with both large scale mining (LSM) companies and ASGM. In December 2024 rapid baseline site assessments are planned to be conducted. Site sampling will be done to determine gold-bearing material; gold distribution and extend of mineralization and groups working in the area. The site selection criteria mentioned as per project document include:

- Legality of the mining site (formal concession)
- Safety of the site
- Favourable attitude of the concession owner (formal/informal)
- A nearby community
- ASM operations use mercury
- Focus on alluvial deposits and alluvial mining of tailings



- Presence of an interested group of gold miners
- Geology of the area supports gold occurrences
- Deforestation caused by hydraulic mining
- High biodiversity impact of mining
- Sufficient exposure and potential to have broader impact
- Accessibility of the site and expense of getting there

Based on the results of the sampling and the abovementioned criteria, the project will select the site for setting up the demonstration plant.

**The EMSAGS Project is now seeking the services of a qualified and experienced international engineering firm with capacity to design, construct and commission a mercury-free processing facility/ plant in the district of Brokopondo for the demonstration of environmentally responsible technologies to stakeholders, including small-scale miners, concession holders, lead miners, equipment owners, local communities, government and local authorities, NGOs and others.** The facility/plant should be aligned to mineral occurrence in the area and surrounding areas.

## 2. Objective of the assignment

The objective of the assignment is to disseminate environmentally responsible gold mining practices (ERMPs) through designing, building and commissioning of a mercury-free gold processing facility/ plant in the district of Brokopondo, Suriname. The purpose of the promotion of ERMPs is to increase miners' technical knowledge on best practices, raise awareness of the negative environmental and health impacts of current mining practices and assist them in shifting to ERM practices.

Note that the demonstration plant flowsheet should not only be technically feasible but aligned with operator's capacity and sustainability concerns beyond the project implementation.. The EMSAGS project is not looking for the State of the Art/ most high tech option, but rather promotes a pragmatic solution that can be integrated and adapted by the generality of ASGM operations in Suriname working in similar conditions. The processing facility is a demonstration plant designed to process typical ASGM ores in the area and surrounding areas. The circuit should be relevant to the local context.



### 3. Scope of work

To achieve the abovementioned objective, the firm is expected to perform the following **specific activities**:

- ❖ **Phase 1: Site inspection and verification.** Undertake an inspection of the proposed site to assess its suitability and to identify the exact location of the processing plant. Perform a risk assessment related to the environmental and social impacts of the setting-up of the demonstration plant.
- ❖ **Phase 2: Design of the demonstration plant.** Develop the conceptual process flow diagram and design the processing plant taking into account criteria such as the geological conditions, community consultations, cost effectiveness, available mercury-free equipment, and other criteria. Define the equipment layout of the mercury free demonstration plant. Determine equipment requirements and capacities for all the sections of the designed processing unit, considering the equipment procured under the project. Develop related architectural and engineering drawings. Design parameters for the following:

Crushing, milling, screening, scrubbing, and gravity concentration section - Design the entire section, including water reticulation requirements, including a storm-water management system for the whole site and dust emission systems and generate related equipment layout diagrams; Please note that ASGM operations in Suriname consist of alluvial, colluvial and eluvial material which may require crushing and milling. The final design will be informed by geological conditions at site and surrounding areas.

Tailings storage facility (TSF) - Design the entire section as an environmentally sustainable facility that meets appropriate requirements and identify a suitable area within the plant site where TSF should be constructed.

Gold recovery, smelting and storage section.

- ❖ **Phase 3: Constructing, testing and commissioning the demonstration plant.** Install the processing equipment as per approved demonstration plant flowsheet. Prepare a mercury free basic plant operations manual, which should include sections on occupational safety and health, the safe operations of the plant, detailed emergency response procedures and the Tailing Storage Facility. Set up a field laboratory as part of the demonstration plant to support site sampling. Selection of laboratory equipment and supervise commissioning and development of standard procedures.



Provide support for the operation of the processing plant, including equipment support in case of early teething problems and make necessary adjustments. Test the circuit to ensure it is processing the gold efficiently and to ensure the recovery is as projected. Take samples to be analyzed to ensure quality assurance of the circuit. Perform circuit sampling to determine the amount of gold made by the circuit at each area in the circuit. As in most cases miners may not be able to afford the whole circuit, it would be important to know which parts of the circuit is producing more gold and which part might be the best fit for the modification of the miner's operation.

- ❖ **Phase 4: Capacity building of miners.** Provide training, guidance and assistance to miners in the use of the mercury-free equipment. At least 300 miners will be trained in zero mercury methods, tailings management, waste management. Conduct a profile analysis of the artisanal miners targeted by this demonstration plant and recommend capacity building interventions to improve their operations.

#### 4. Expected Deliverables, Timeframe and Payment distribution

The expected deliverables are as follows:

Phase	Deliverable(s)	Timeframe	Payment schedule
	❖ Inception report, including a detailed work plan and timeline on the proposed planning and execution of the assignment.	2 weeks after signing of the contract	10% of contract sum upon approval of inception report
<b>Phase 1: Site inspection and verification.</b>	❖ Detailed report and maps depicting analysis, recommendations and the exact location of the processing plant.	Month 1- 2	10% of contract sum upon approval of Phase 1 deliverables
<b>Phase 2: Design of the demonstration plant.</b>	❖ Report including design criteria, options' analysis (e.g. cost and benefits), conceptual design drawings (e.g. demonstration plant flowsheet, Plant 3D view, top, front and side views equipment layout, equipment	Month 2- 3	50% of contract sum upon approval of phase 2 deliverables



	requirements and capacities, and define implementation and operating costs.		
<b>Phase 3: Constructing, testing and commissioning the demonstration plant.</b>	<ul style="list-style-type: none"> <li>❖ Establishment of the demonstration plant (Implementation Report including pictures).</li> <li>❖ Plant operations manual, including sections on OHS and the safe operations of the Tailing Storage Facility.</li> <li>❖ Set up of a field laboratory. (Report with pictures)</li> <li>❖ Technical reports (also including official lab results of samplings performed at the plant) testing of the circuit, mercury assessments and circuit sampling.</li> <li>❖ Commissioning of the demonstration plant (Commissioning report).</li> </ul>	Month 4 - 5	10% of contract sum upon approval of Phase 3 deliverables
<b>Phase 4: Capacity building of miners.</b>	<ul style="list-style-type: none"> <li>❖ Report describing the profile analysis of the artisanal miners targeted by this demonstration plant and recommendations on capacity building interventions to improve their operations.</li> <li>❖ Provide training, guidance and assistance to miners in the use of the mercury-free equipment (target numbers to be defined by PMU).</li> </ul>	Month 6	10% of contract sum upon approval of Phase 4 deliverables
	Final narrative report providing a description of all activities of the assignment: the planning and execution of assignment, including Phase 1 - Phase 4, and recommendations for the design and construction of follow-up ERM processing units in Suriname.	2 weeks after contract end date	10% of contract sum upon approval of final narrative report



## 5. Selection criteria

The relevant firm personnel must have the following qualifications and experience:

- Appropriate Mining engineering and Architectural qualifications from a recognized University;
- Expertise in the field of mining and process engineering and design;
- At least 8 years proven experience in gold mining and processing discipline;
- Experience in community engagement and stakeholder consultation;
- Documented record of experience in undertaking similar assignments;
- Registered with professional engineering institute;
- Knowledge of international environmental legislation;
- Proven experience of working on similar projects in the region and countries with similar small scale gold mining environments.
- Working experience with national and international organizations e.g. NIMOS, UN organizations would be preferable.

## 6. Monitoring and Evaluation

To ensure effective achievement of the deliverables of the assignment, the engineering firm will track progress, evaluate effectiveness, report on results and learnings and timely discuss necessary corrective and adaptive measures with the PMU. To discuss the work's progress and corrective measures the engineering firm will have weekly technical and management meetings with the PMU and supervisory consultants assigned by the PMU.

The EMSAGS Project will hire an international ERM expert who will work closely with the EMSAGS Project Coordinator, and the firm contracted for the design, construction and commissioning of the demonstration plant PMU to supervise the activities of the engineering firm. His/ her specific tasks, will include, among others:

- a. Support the site selection process.
- b. Review documents related to the design of the plant and provide recommendations and feedback to the PMU.
- c. Supervise the construction, testing and commissioning of the demonstration plant.
- d. Work with engineering firm to plan and handover plan and capacity program for the local stakeholders.



- e. Undertake any other task related to the direction and supervision of the works, as may be required during the construction period.
- f. Support the PMU with technical input on all procurement related to the construction and setting up of the demonstration plant.
- g. Support selection of laboratory equipment and supervise development of standard procedures.
- h. Conduct mercury assessment to know how much mercury is being avoid/eliminated by the plant v.s. conventional method.

## 7. Application Procedure

Interested firms are required to submit a completed “Form for submitting service provider’s proposal”, see Annex 2 RFP.

## 8. Submission and opening of proposals

All proposals must be submitted to the email address: [info-EMSAGS@nimos.org](mailto:info-EMSAGS@nimos.org), with the subject reading as follows: “*Application for design & construct demo plant*”. Please ensure that the Technical Proposal and Financial Proposal are submitted as SEPARATE FILES in one email. Any proposal that arrives after the deadline for submission of proposals as mentioned in the advertisement shall not be considered.

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