

# Tamakay Resources Incorporated

## Tamakay Mining Project

This Background Information Document (BID) aims to inform stakeholders of the proposed mining project by Tamakay Resources Inc. and seeks to:

- ✓ *Provide basic information on the Project*
- ✓ *Explain why an Environmental and Social Impact Assessment (ESIA) is being undertaken*
- ✓ *Provide information about the ESIA process*

### Project Title

Tamakay Mining Project

### Company Profile and Contact Details

Tamakay Mining Project (Project) is owned and will be developed and operated by Tamakay Resources Inc, a Guyanese registered company under the Laws of Guyana. The company was registered on the 13<sup>th</sup> May 2010. The company has several other mineral interests in Guyana and currently produces gold and diamonds from them.

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### 1.0 Project Location, Accessibility and Area of Operation

The project area is located on the left bank of the Mazaruni River, left bank Essequibo River approximately 308 kilometers up (Figure 1). The project area is located in the middle Mazaruni area, in mining district #3.

The area can be accessed via aircraft from Ogle International Airport to Olive Creek then by boat to Tamakay Landing. It can also be accessed via overland transportation from Georgetown to Teperu crossing, and then crossing the Mazaruni River via a Barge, continuing along the Itaballi-Puruni road. A second crossing via barge across the Puruni river then onto Olive Creek, from where the journey is completed unto Tamakay landing via boat

The area of location is located on a tract of state land located in the mazaruni Mining District No 3 as shown on Terra Surveys Topographic Map 24NE, within the following boundaries.

Commencing from point 1, located at geographic coordinates of longitude 60011'6" and latitude 6022'46" thence at a true bearing of 00 for a distance of approximately 4 miles 836 yards to a point 2, located at geographical coordinates of longitude 60011'6" and latitude 6026'39" thence at a true bearing of 2700 for a distance of approximately 4 miles 838 yards to a point 3, located at geographical coordinates of longitude 60015'0" and latitude 6026'39" thence at a true bearing of 1800 for a distance of approximately 4 miles 832 yards to a point 4, located at geographical coordinates of longitude 60015'0" and latitude 6022'46" thence at a true bearing of 9000 for a distance of approximately 4 miles

828 yards to the point of commencement point 1. Thus enclosing an area of approximately 12800 acres, save and except lands lawfully occupied.

There are eighty nine (89) medium scale prospecting permits surrounding the Tamakay Resources inc. property. (Figure 2)

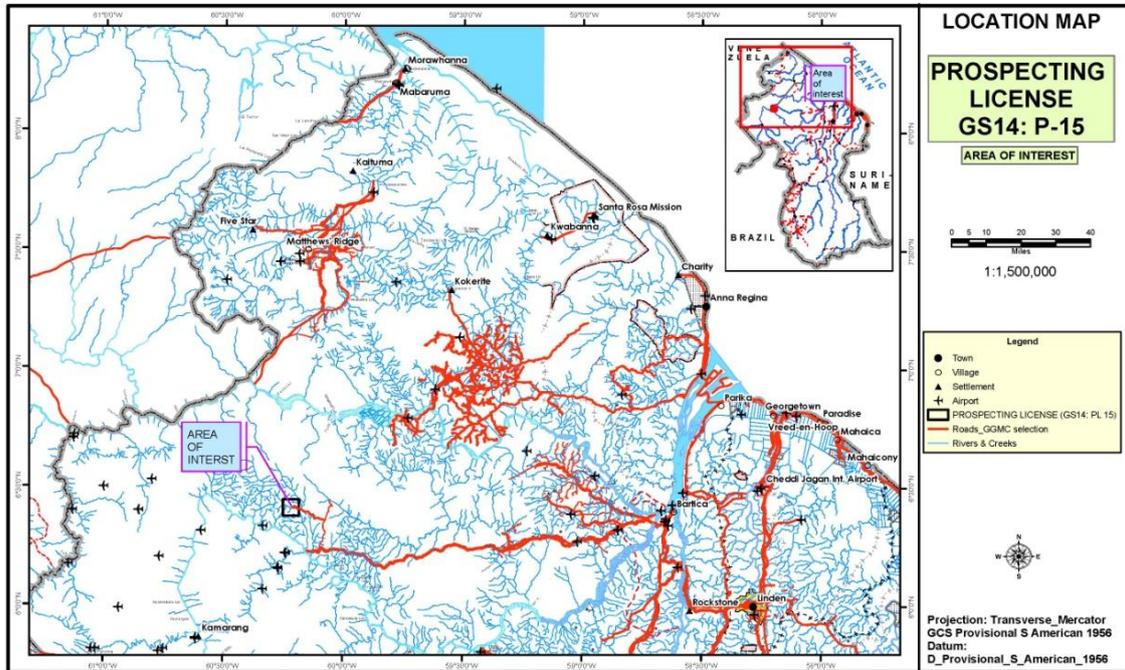


Figure 1 Location Map

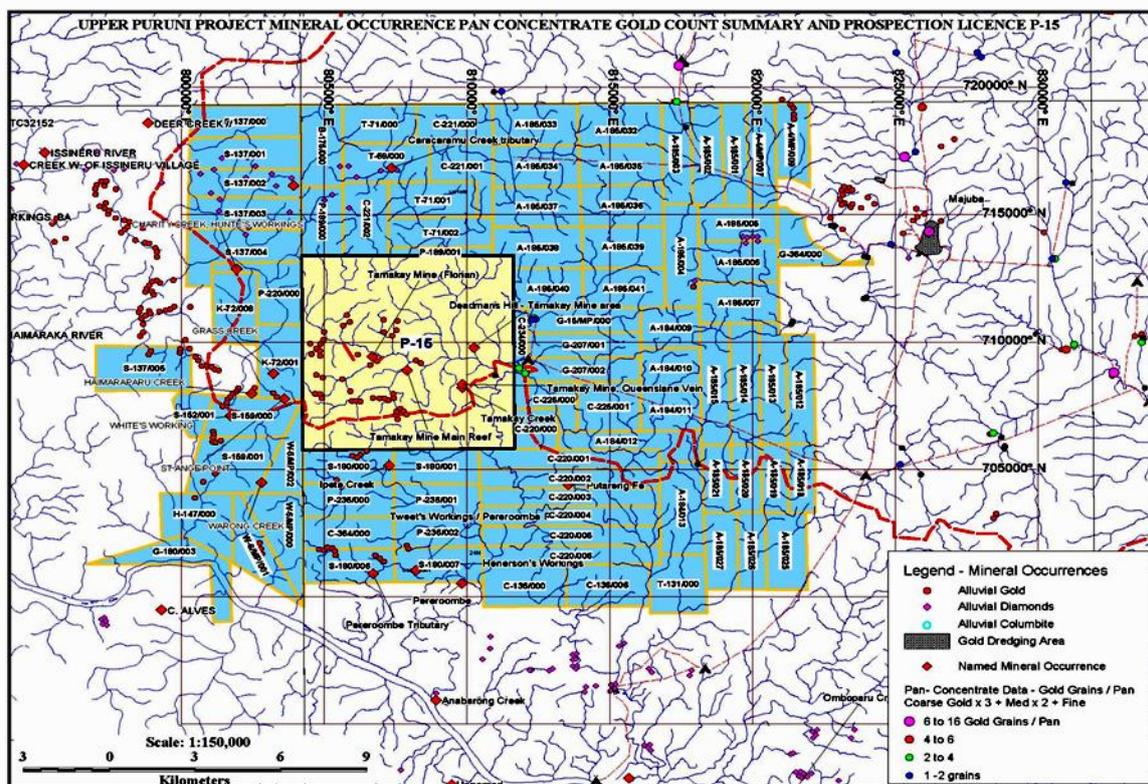


Figure 2 Prospecting Permits surrounding Tamakay Resources Inc Site

### 1.3 Mining and Exploration Background

According to E.R. Pollard, 1956, "The Geology of the Issineru-Enachu District, Mazaruni River", Bulletin No 29, mining in the project area was first recorded in 1937, when a local organization Tamakay Mining Syndicate operated two stamp mills near the Tamakay Creek. The production figures are not available. In the same year the report stated that W. Gomes, a Guyanese miner, installed a 10 ton ball mill to process ore from his mining claims Trial 1 and Trial 2. It was reported that 772.262 ounces of gold were produced. M.C. Correira operated two stamp mills in the area in 1938 and produced 893.59 ounces and from 1953 - 1954, a company "Diamond and Metal Exploration Inc" using rock crushers and ball mill produced 564 ounces of gold. In summarizing, it is reported that the area produced 2887.507 ounces of gold from 1937 to 1954. There is no other information available although it is known that the Golden Stars Resources Limited conducted some exploration in the late 1980's to the early 1990's

### 2.0 Geological Setting

The project area is fully situated within the Precambrian Guyana Shield (Figure 3). In the northern portion there is a large diorite to Granodiorite Intrusive, characterized by low topography, is enclosed by metamorphosed Acid Volcanic Seried and Older Basic Intrusives which is a typical greenstone-granites environment. Often primary gold mineralization is controlled by meta-basic intrusive-granite contacts. Visible native gold with pyrite in narrow fracture veins in bluish to gray-white clay matrix are very common in the area. Primary gold mineralization in this geological environment is massive quartz veins with native gold, quartz veins with gold and pyrite or gold-bearing pyrite in silicified zones in great shear zones and subsidiary faults. These mineralizations, predominantly located in amphibolities, are flanked by alteration zones. Some of the hills in the area are capped with White Sand deposits; alluvium of Proto-Mazaruin.

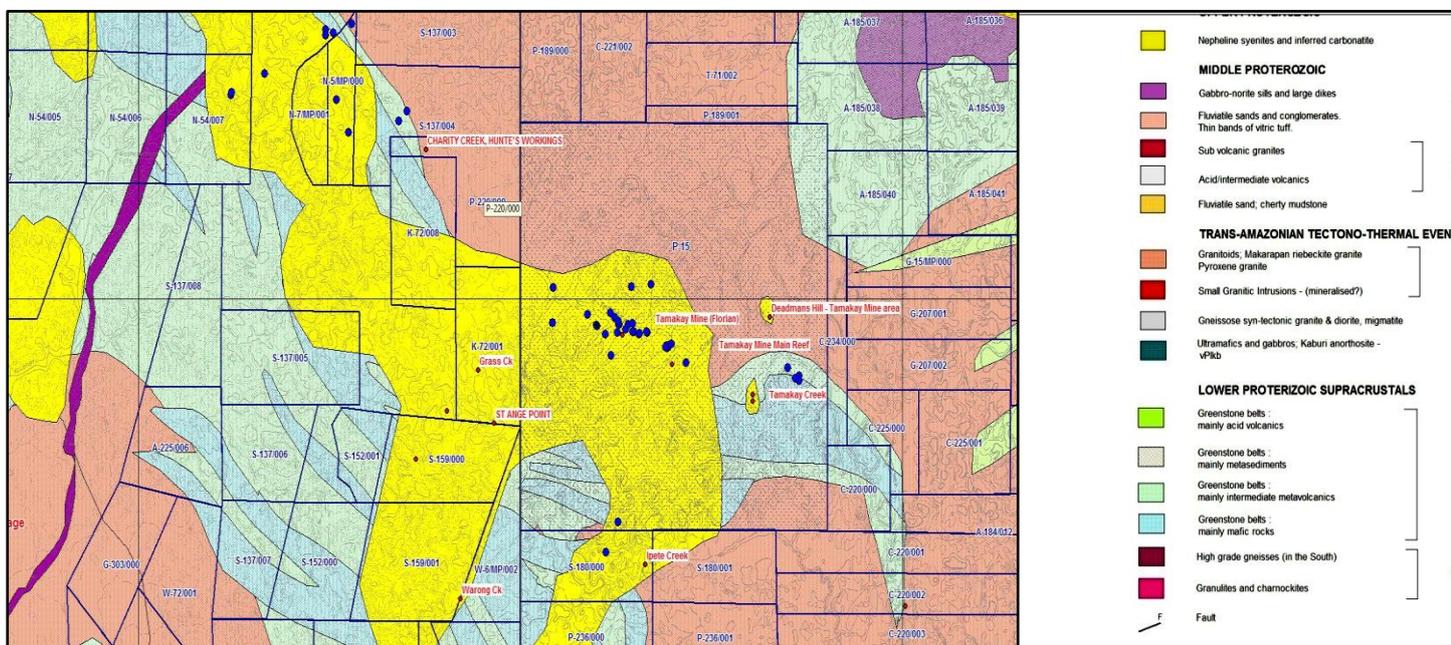


Figure 3 Mineral License, Regional Geology & Gold Anomaly Map, Pl-15

## 3.0 Project Plan

The total disturbance footprint of the operation including the road network corridor is estimated to be approximately 550 hectares of state lands.

The Tamakay Project is a gold and diamond mining project. The Project will produce more than 8124.7 kilograms of gold for the five years period. In addition to the gold resource, it has been confirmed through sampling and metallurgical testing that economically recoverable quantities of diamonds are also resident in the ore body. Past and recent exploration and current mining activities had confirmed/identified the availability of approximately 4.875 Mt of ore, with an estimated project life of approximately five years.

Approximately 140 people will be employed full time, drawn from a largely locally available pool of workers. This schedule estimates a plant through-put of approximately 2,800 tonnes per day, which translates into an annual mill through-put of approximately 0.896 Mt per year.

Mining of the ore will be through conventional open-pit mining techniques using bulldozers to clear the mining area and remove the top soil which will be loaded with front end loaders and transported by haul trucks to top soil storage areas. The overburden will be stripped by excavators, loaded into haul trucks and transported to the waste dumps. The ore will be mined by excavator, transported by haul trucks to the processing plant stock pile.

The ore will be transported to the processing plant by haul trucks, screened via a grizzly, and subsequently sluiced to scavenge free gold. The tailings will be transported via gravel pumps to a wash plant with double hutch Pan American Jigs and locally constructed "lavadore" to remove any diamonds and free fine gold particles. The oversized material from grizzly and tailings from the primary jigs will be crushed and grinded to liberate plocked and partially locked gold particles. The product from the grinding mills will be upgraded with centrifuges and subsequent shaking tables. The final gold concentrate will be smelted directly to form gold bullion.

### 3.1 Mine Plan

#### 3.1.1 Open Pit Plans

The ultimate extent of the pit is based on long-range price forecasts for gold, as well as engineering estimates of operating costs, concentrator recoveries, anticipated smelting charges, and payment terms. The design of the open pit and internal mining phases incorporates geotechnical recommendations for safe slope angles, internal ramp development for access to all working areas, and pit wall smoothing to enhance stability and operator safety.

Pit slope angles will vary according to soil strength, lithology and structural controls, but are expected to range between 28° and 48°.

The basis for mine planning was the US\$1000/ounce with the area containing an estimated 4.48 Mt of ore and 19.5 Mt of waste material. Free milling ore is presently estimated at 3.63 Mt of mineralized material, which is contained within the above ore figures. 248,000 tonnes of tailings with grades averaging up to 1.55 g/t will also be re-processed.

At the rim, the initial open pit will be 130 metres across north to south, 260 metres across east to west, and will be about 3 to 6 metres deep. The pit area totals about 400 hectares, and an additional 150 hectares will be disturbed for access/haul roads, ore stockpiles, the primary crusher and grinding mills, tailings, water pipelines, truck shop, and storage of fuel and lubricants etc.

### 3.1.2 Pit Production Schedule

Gold milling is scheduled for 24 hours per day, 6 days per week, and 312 days per year at an ore processing rate of 2,800 tpd, or 0.896 Mt per annum. The open pit mine will operate using the same schedule. The Project will use four rotating crews, each working 12-hour shifts, to provide continuous operator coverage.

The Project's production schedule is presented in Table 3.1. Preproduction stripping will require 6 months to prepare for full-scale mine operations, training work crews, constructing access and haul roads, and clearing and grubbing the pit and waste rock storage areas that will be disturbed during the initial years of operation. Initially the material handling rates that will occur in Years 1 to 2, will average about 2,500 tpd of total.

The ore will be subjected to screening to remove oversized material that will be directed to the primary crusher and concentrator, while the undersized will be directed to a washing plant to recover free gold and diamonds. The tailings from the treatment plant will be grounded via ball mills. The mill product will be concentrated in a centrifuge and upgraded on a shaking table before smelting. Treatment of pit-run waste material and dewatered mill tailings is discussed in Section 4.

A 1 Mt ore stockpile will be constructed near the primary crusher, near the processing plant, to facilitate subsequent recovery in Year 1 of mill operations. Run-of-mine stockpiles will be located near mine pits, will be used throughout the mine's life to provide flexibility in handling short-term operating disruptions in mining.

Time Period	Gold Ore (Mill)		Waste	Stripping Ratio	Reprocessing Tailings	
	Tons	Au (g/t)	Tonnes		Tonnes	Au (g/t)
Preprod.					48,000	1.75
Year 1	780,000	2.59	3,400,000	4.36	48,000	1.68
Year 2	780,000	2.44	3,700,000	4.74	50,000	1.53
Year 3	1,094,000	2.34	4,200,000	3.84	50,000	1.48
Year 4	1,100,000	2.18	4,300,000	3.91	52,000	1.31
Year 5	726,000	2.16	3,900,000	5.37		
TOTAL	4,480,000	2.34	19,500,000	4.35	248,000	1.55

**TABLE 3.1 PROJECTION SCHEDULE**

### 3.1.3 Ore Transport

The ore will be transported via small (40-T) Caterpillar 770 off-highway haul trucks (PLATE 3.1) from the open pit to the washing plant which will be located near to the primary crusher. After washing and crushing, the ore will travel by overland conveyor to a covered crushed ore stockpile. The material will then pass through feeders and onto another conveyor that will discharge into the semi-autogenous grinding (SAG) mill at a daily rate of 1000 tpd.



**PLATE 3.1                      40 T OFF HIGHWAY TRUCKS**

A run-of-mine (ROM) coarse ore stockpile will be located near the primary crusher to temporarily hold ore mined before mill startup. The stockpile will also provide equipment utilization flexibility and short-term ore storage in case of interruptions in crusher operation. The ROM stockpile will hold 20,000 to 40,000 T of ore, but will reach a projected maximum size of about 80,000T at the end of pre-production stripping.

### **3.1.4 Topsoil**

Adequate topsoil management was considered the most important factor in successful rehabilitation of the project since the objective is to restore the native ecosystem of the project area. The topsoil from all areas being cleared would be retained for subsequent rehabilitation. The topsoil contains the majority of the seeds and other plant propagules (such as rhizomes, lignotubers, roots etc), soil micro-organisms, organic matter and much of the more labile (more readily cycled) plant nutrients. Research data now available from other minesites demonstrate that in some areas, waste rock weathers rapidly to form suitable materials for revegetation.

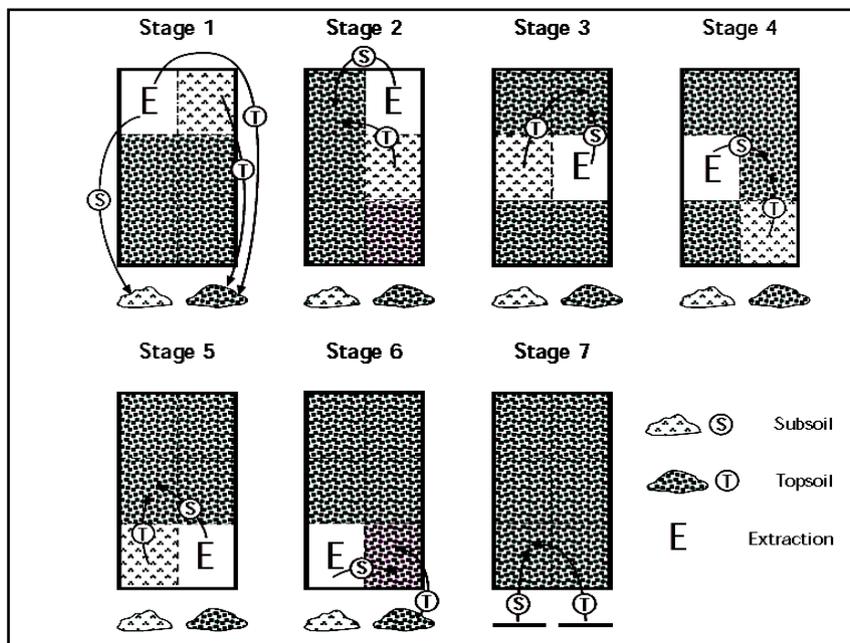
The topsoil commonly referred to as the A1 horizon in Tamakay is usually darker than the underlying soil because of the accumulation of organic matter. The complete A1 horizon would be removed. Special attempt would be made to avoid stripping deeper soil horizons with the topsoil since they may have poor structure or high clay contents. In areas where the A1 horizon is not obvious, the top 100-300 mm of soil would be recovered.

Double stripping the topsoil, where the top 50-100 mm of soil is removed, and returned separately and on top of the remaining topsoil, may be warranted, particularly since the aim is to restore the native flora. Most of the seeds are stored in this top layer of soil, and its removal and return as a thin layer on the surface will maximise the contribution of these seeds to the post-mining flora.

The topsoil will be removed by bulldozers, loaded by front-end loaders to haul trucks and transported to areas to be specified for topsoil storage

## 3.2 Overburden Management Strategy

### 3.2.1 General



**FIGURE 4 OVERBURDEN AND TOPSOIL MANAGEMENT STRATEGY**

Waste material will be managed in areas located to the south of the initial open pit. The placement of the overburden is strategic to allow progressive reclamation (Figure 3.4). After replacement the topsoil will be spread and revegetated.

The project envisioned that three ponds will be established initially to allow settlement of the solid fraction and the decanted water will be recycled to the washing plant and jig circuit. The centrifuge circuit will only process predominantly heavy concentrate and as such, the tailings will not have high turbidity. A small pond will be adequate for handling centrifuge/tables tailings.

Haul trucks will back up to the dumping face, which is protected by a safety berm, and dump overburden over the side. Loads may occasionally be dumped atop the current lift, particularly when another overriding lift or surface regrading is planned for the area. Dozers will be used to maintain safety berms along all waste storage facility crests, pushing excess material over the face and maintaining proper surface gradients for drainage.

Previously undisturbed areas affected by advancing waste storage facilities will be cleared and grubbed prior to the deposition of pit-run. Any growth media encountered will be stored for use in future reclamation activities or placed directly into active reclamation areas.

Growth media will be spread across the surface, seeded, fertilized and managed as necessary to promote revegetation of the waste storage area. Reclamation of these areas will be conducted as soon as the ultimate waste facility limits have been reached, which is anticipated to be concurrent with waste disposal operations in other parts of the storage facility.

### 3.3 Ore Processing

The ROM material will be transported to a portable wash plant (Plate 3.5 and Figure 3.1) consisting of a fixed grizzly screen to separate -12 cm material and a scavenger sluice box to cover coarse liberated gold particles. The +12 cm material will be transported to the coarse ore stockpile for primary crushing and grinding. The tailings from the sluice box will be transported by belt conveyor to a processing plant comprised of Pan American Jigs (scavenger) and locally produced jigs "lavador" to recover finer gold particles and diamonds (cleaner). The tailings from this plant will be grounded and upgraded with a centrifuge and further shaking table.



PLATE 3.1 WASHING PLANT

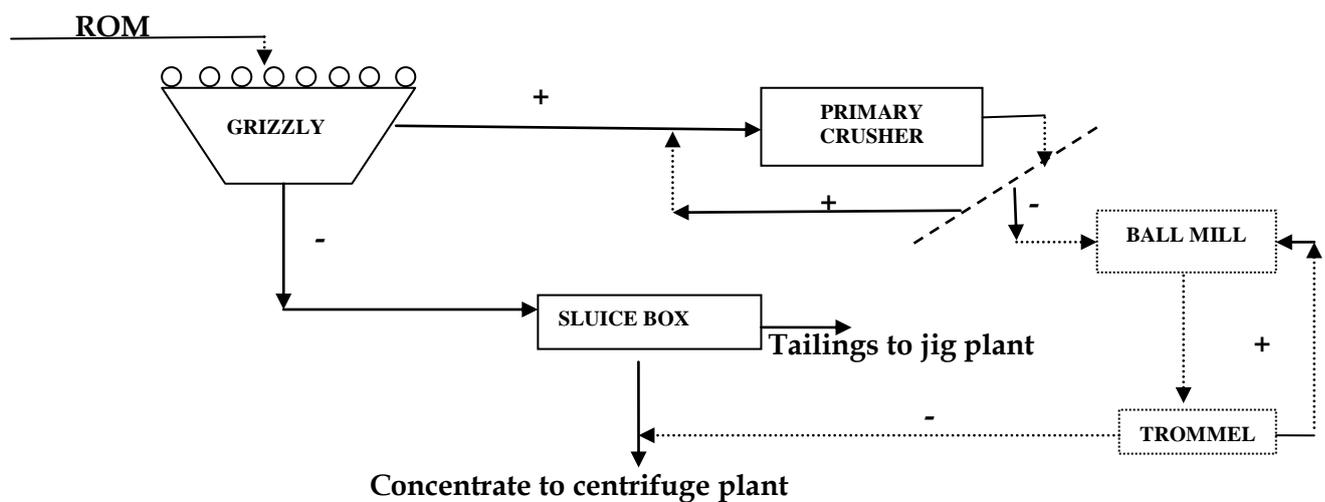


FIGURE 3.1 SCREENING, CRUSHING AND GRINDING CIRCUITS

### 3.3.1 Process Operations Overview

A summary of the process operations required to recover gold and diamonds from the ore

ROM material will be subjected to intense washing and screening to remove clays and -12cm material.

- ✓ The -12cm material will pass through a rougher sluice box to remove free gold particles.
- ✓ The tailings from the sluicebox will go to a Jig Plant to remove more free gold and diamonds.
- ✓ The tailings from the Jig Plant (Plate 3.6 and Figure 3.2) will go directly to a ball mills to be grounded to less than 100-mesh, or about as fine as sand to liberate gold that may be locked with the quartz.
- ✓ The Primary Crusher (Sag Mill) will reduce +12cm material from the grizzly to 6 cm for feeding the ball mills.
- ✓ All material grounded by the ball mills will be concentrated by centrifuges and upgraded by shaking tables.
- ✓ Concentrate from the rougher sluice will be upgraded via centrifuge and shaking table (Figure 3.3).
- ✓ The gold produce will be smelted directly without the use of chemicals.
- ✓ Water from tailings and concentrate dewatering operations will be recycled for use in the process

## 4.0 Staffing

- ✓ The estimated staffing requirement for the Tamakay Project is 140 employees, which is considered average staffing level for the mine life.
- ✓
- ✓ The respective roles of the employees break down as follows:
- ✓ General & Administrative 28
- ✓ Mine Operations 40
- ✓ Mill Operations 30
- ✓ Camp support staff 20
- ✓ Security 16
- ✓ Laboratory 6

The supporting departments that compose the general and administrative area are administration (28 employees), accounting and procurement (4), human resources (4), safety and environmental (4) and laboratory (6) employees. These employees are for the most part salary and will be working on a 40-hour per week work schedule, Monday through Friday.

On average, the mine operation will employ 24 hourly employees and 16 salaried employees. The salaried employees consist of the mine engineering department (4), geology department (4), and the shift supervisors (8). Staff in the engineering/geology departments will work a 40-hour schedule, Monday through Friday. The shift supervisors will work 12-hour shifts on a four-days-on/four-days-off schedule.

The mine hourly employees consist of operations employees such as excavator operators, haul truck drivers, drill operators and other mine operating support, while the maintenance crews will consist of electricians, mechanics, and welders. The schedule for the operation crews will be two 12-hour shifts per day, seven days a week. A maintenance crew will work one 12-hour shift per day, seven days a week on day shift. In addition there will be a small night shift maintenance crew that will work one 12-hour shift per day on a seven-day work week.

The mill operations have 12 salaried employees and 18 hourly employees. The salaried employees include the mill administration, shift supervisors and maintenance supervisors. The hourly employees consist of crusher operators, centrifuge and jig circuit operators, tailing operators, and other support personnel. These employees will be working two 12-hour shifts on a four-days-on/four-days-off schedule.

The maintenance crews will consist of mechanics/welders, maintenance helpers and electrical/instrument technicians. The maintenance crews will work a 40-hour schedule, five days per week only. The maintenance group will work a 40-hour schedule, five days per week while operations will work 12-hour shifts, seven days per week.

The security will consist of 16 persons working on 12 hour shifts, seven days per week and 52 weeks per year.

## **5.0 Mining Camps and Associated Facilities**

The living accommodation will be constructed with logs from the project site. Ten bungalows will be constructed to accommodate eight persons each. Each one will have two toilets and bath facilities and will have cupboards for each occupant. Each will have a table for dining and reading. There will be special quarters for management and senior personnel.

A kitchen/restaurant will be built to prepare meals and for dining. Breakfast will be served between 4.00 am and 7.00 am, lunch between 11.00 am and 1.00 pm at the various locations and dinner between 5.00 pm and 8.00 pm. Light snack will be available throughout the day up to 10.00 pm.

The Company will cater for all the laundrying requirements of the staff and will employ six persons to execute these tasks along with cleaning the camps. A small truck will be used to transport garbage from the camp site to the dump.

A recreation building will also be established and will have a table tennis table, pool table, tables for dominoes, cards etc. There will also be mini bar for refreshments and other toileteries. A large screen TV and DVD will be available with cable television. There are plans to develop an area for cricket, football and other outdoor activities.

A guest house will be constructed to host 20 visitors including students from the University of Guyana pursuing research in geology, mining or mineral processing engineer or environmental sciences.

TABLE 6.1

## ENVIRONMENTAL MONITORING PLANS

Parameter	Institution Responsible	Frequency of Monitoring	Location of monitoring
<b>Physical environment</b>			
Weather Rainfall Temperature Humidity Evaporation Wind	TRI	Daily	Tamakay at fixed location where monitoring station is installed
<b>Biological environment</b>			
Air Quality Total Suspended Particles (TSPs)	TRI	Quarterly	Stockpile areas and at the boundaries of the operations site
Noise Decibels	TRI	Quarterly	Stockpile areas where loading takes place and along the haulage path.
Water Quality Ph Turbidity COD Heavy Metals TSS Conductivity, DO	TRI	Biannually	Points of site drainage into area drainage and 500m downstream of waterway (s)
Stream Flows	TRI	Quarterly	Main Creeks and Waterways including Mazaruni River
Waste Management	TRI	Weekly Biannually	Waste receptacles and large storage container, incinerator and general project area
<b>Socio-economic environment</b>			
Health and Safety	TRI	Biannually	Use of protective gear by staff Condition of fire-fighting stations and equipment Adequate and appropriate signage for emergencies

		Monthly	Location of Emergency Procedures  In house training to keep employees up to date with various safety procedures. Health conditions of staff, in particular as it relates to respiratory ailments
Employment and Benefits	TRI	Biannually  Biannually	Number of persons from the region employed Conditions of employment  Assistance to regional residence by company

## 6.0 Environmental Issues

Tamakay Resources Inc plans to develop a large scale alluvial mine to extract gold and diamonds from their property located at the Tamakay area, middle Mazaruni River. As part of the licensing process, the company requires to fulfill all the necessary environmental permitting obligations before mining could commence. As such, the company has applied for Environmental Authorization simultaneously with the Mining License application and as such is required to conduct an Environmental and Social Impact Assessment (ESIA). The company contracted Mr. Rickford Vieira as the ESIA technical consultant to spearhead the study. The company will acquire baseline information to be able to effectively monitor the environment for any potential impacts. Some of the parameters to be monitored are found in Table 6.1 above.

### 6.1. Objectives of the ESIA

The objectives of the ESIA are to:

- ✓ Thoroughly document ecological baseline conditions (pre-mining conditions) of the study area and the socio-economic conditions of the effected communities.
- ✓ Place the ecological baseline conditions of the concession area in the context of the surrounding region.
- ✓ Inform, obtain and address contributions from stakeholders including relevant authorities and the public.
- ✓ Assess in detail, the environmental and social impact that would result from the project
- ✓ Identify mitigation measures that would reduce the significance of predicted negative impacts or enhanced predicted benefits of the proposed mining projects
- ✓ Develop an appropriate Monitoring Plan for the proposed mining project based on the Mining Plan of Operation.
- ✓ Develop a Conceptual Closure and Rehabilitation Plan for the proposed mining project addressing issued of post closure land use and projected effectiveness of rehabilitation.
- ✓ Meet the requirements of the environmental regulatory agencies (EPA and GGMC) in Guyana as well as international best practice for project of this nature.

The ESIA will identify the potential impacts associated with the development and then provide the measures that will be required to manage those impacts, which will be incorporated into an Environmental Management and Monitoring Plan. The ESIA, will be conducted by a multi-disciplinary team of experts with the stages identified as follows:

## 6.2 Specific Issues to be addresses by the ESIA

- The consultant team will address the full range of issues as it pertains to the proposed project. Specific issues include:
- A detailed description of the project area including maps showing the boundaries of the Project area, layout of current land uses of the surrounding areas and network of drainage systems.
- Previous and current water quality data from surrounding streams which include pH, TSS or turbidity, conductivity, TDS, ammonia and sulphates and the establishment of fixed stations for continuous monitoring include the Mazaruni River
- Details on transport arrangements for ore from extraction site to processing
- Dust and noise management in particular from haul roads, crushing plant and stockpiles
- Impacts to aquatic and terrestrial flora and fauna
- Water Use and effluent/tailings management including potential for acid mine drainage
- Waste management
- Land use
- Cultural and arcaeological resources
- Occupational Health and Safety
- Social and economic impacts to the local communities of Region 7 including direct benefits such as jobs, royalties and tributes, possible scholarships and apprentice schemes and other benefits.
- Cumulative Impacts of the project
- Presentation of the proposed Mine Plan with all relevant information concerning potential impacts on the environment and develop mitigation strategies to reduce the identified impacts.
- Presentation of a Sediment Control Plan as part of the Mine Plan
- A Monitoring Plan with focus on reclamation efforts and on discharge and receiving water quality limits with provisions for effluent discharge monitoring. This will be base on the results of the ESIA and the management plan
- A detailed Mine Reclamation Plan to encourage progressive rehabilitation with consideration for the eventual return of the land to the regional/governmental authorities.
- A Detailed Emergency Response Plan to respond to environmental emergencies and issues with respect to worker's safety as well as residents. The Plan will consider identification of emergencies, response mechanisms, personnel responsibilities and equipment and training requirements.

## 7.0 Closure Concepts

The draft reclamation plan proposed for the Tamakay Project site has several key components, referred to as initiatives. These initiatives provide the physical and philosophical foundation for the reclamation plan and will remain constant throughout the operational life of the facility. These initiatives include: design of the facilities with closure goals in mind; concurrent reclamation practices; constraining disturbances to a single drainage; minimizing downstream hydrologic disturbances; preparing a comprehensive drainage plan; using modern technology to minimize the generation of impacted water; managing operations to minimize environmental impacts; reclaiming the facilities to blend with surrounding topography; constructing an outer facility shell to reduce visual impacts of the mining operations; salvaging soil resources; performing selective vegetation removal; revegetating reclaimed surfaces; and, preparing an estimated closure cost. One of the major initiatives of the Plan will be to facilitate concurrent reclamation of the outer shell of the waste and tailings storage areas and to provide a perimeter buttress to mitigate the visual impact of the Project. It is envisioned that the selection of seedbed preparation, species, and site revegetation will be on a research agreement with the University of Guyana where the Project will provide a research grant to the Faculty of Technology or Agriculture.

## 7.1 The Closure Planning Process

Ideally a mineral operation, as a temporary use of land, should not impose any permanent constraints on the options for future beneficial use of the site, nor have any permanent effects on the local water resources, biodiversity and overall landscape quality or associated socio-economic development.

This conceptual Closure and Decommissioning Plan (CDP) will be developed for the future operations of TRI. The CDP details in conceptual form the measures that will be employed at closure, to ensure that the sites are rehabilitated to an appropriate level, and outlines preliminary performance criteria and monitoring requirements. This plan will be developed and finalized in consultation with relevant authorities and stakeholders in advance of closure.

In the context of this Plan, the term 'closure' is taken to encompass decommissioning, demolition and rehabilitation activities prior to close out of the site. References to 'post closure' relate to the period following termination of closure activities (for example, ongoing monitoring, and after-care

As a part of the legal requirement of Guyana, the company embarked on a project to identify suitable closure and decommissioning methods for the project. The widely accepted 'de facto' standards of the World Bank Group and the corporate standards were used in compiling this preliminary. The minimum standard will dictate that all operations have closure plans that are regularly reviewed and updated and which identify, mitigate where possible, and manage both current and future health, safety, environment, community, and other business risks associated with closure.

Compiling of the CDP is the first stage of closure process. The CDP will address individual closure issues and action required, including details of performance criteria and monitoring so that the company can prepare financial provisions for the process.

More specifically, the objectives of the overall closure planning process, and the specific provisions within that process, are to:

Contribute to the management of environmental issues during planning and operational phases as a means of facilitating the effective closure;

identify post-closure land use objectives through a process of consultation with stakeholders, communities and land owners;

identify suitable best practice measures that are appropriate to the project context and that are able to: satisfy the requirements of existing Guyana legislation, specifically the Environmental Protection Act and the Mining Act;

meet the corporate requirements of TRI;

- satisfy the standards set out in relevant World Bank documentation;
- through consultation, obtain stakeholder acceptance of closure proposals;
- return land and water resources to pre-mining or otherwise agreed conditions;
- minimize the potential for any negative post-closure impacts and liabilities;
- minimize the requirement for active management of the post-closure environment; and;
- maximize the potential for post-closure environmental and socio-economic benefit.

## 8.0 Financial Analysis and Feasibility Studies

### 8.1 Introduction

Tamakay Resources Inc ("TRI" or the Company) is presenting the development scenario from the recently completed Tamakay Project feasibility. Tamakay is located in the Middle Mazaruni area and has a resource estimate that contains 4.48 million tonnes of gold ores and an unknown quantity of diamonds.

The feasibility study proposes a multi-element mining operation utilising the process flowsheet developed by the Company and draws on extensive studies and similar mining ventures that occurs worldwide. This flowsheet and associated engineering and mining studies are considered as a base-case for the Tamakay Project.

This section of the study provides a clear indication that Tamakay could be developed as an economically robust, and medium to large scale operation to provide gold and diamonds. Estimates indicate that Tamakay gold output could be the largest for a Guyanese owned company.

TRI has taken the decision to accelerate the development of the mining development following the strength of the results generated by studies to date. Significantly, the report has highlighted several areas where the project can be further enhanced to improve the efficiencies and economics surrounding the mining proposal of this scale.

## 8.2 Key Outcomes

- At a processing rate of **0.896 Mt pa**, nominal forecast annual production is equivalent to **1624 kg of gold** per year and of **1000 carats of diamonds** (conservative estimate). Life of mine (LOM) throughput is **4.48 Mt** at an average gold grade of **2.34 g/t**. There are also 248,000 tonnes of tailings grading 1.55g/t that will be mined.
- A pre tax internal rate of return of 34% and a cash payback period of just less than 1.5 years (which includes the pre mining construction period of 1 year), using long term price of US\$1000 per ounce based on market analysis.
- The **NPV for the Tamakay Project is estimated at UD\$53.1M** (pre-tax and discounted using 10%) and takes into account complete payback of the initial capital costs. The NPV is only based upon gold recovers of 75% and did not take diamond production into consideration.
- **Total capital costs are estimated at US\$7.92 million**. This includes mine infrastructure, processing, power generation facilities, roads and an accomodation village. The figure includes a US\$720,000 for contingencies, equivalent to 10% of the total cost. In addition, construction labour rates have been increased by a factor of 10% to allow for the estimated incremental costs of construction. The company is confident that the current estimation can be reduced as the level of certainty is increased.
- In total the project generates a **cummulative operating surplus of US\$193.6 million**, generating an average operating surplus of US\$38.70M per year for the five years of production.
- The revenue achieved from the sale of **gold** is sufficient to cover the total cost of production of both gold and diamonds. In other words, over the LOM, the by product credit that is earned for the sale of gold exceeds the cost of producing diamond; effectively making the cost of producing diamonds free (in actual fact negative).
- **Construction is scheduled to commence in mid 2011 with the first production in 2012.**
- Mining studies propose conventional open pit mines with stripping ratio from 3.84-5.37 for the LOM with the highest grade of 2.59 g/t. Ore widths of greater that 100 m are common.
- Engineering studies identify process routes for the scavenging the free/liberated gold while washing the ore to remove clays and carbonaceous material. A second jig plant to recover diamonds and any gold not scavenged. A grinding circuit to liberate gold still locked with quartz and a final concentrate consisting of centrifuges/shaking table to produce a final

product. Diamonds will be recovered by manually cleaning the final concentrate jig (lavador) on a daily basis.

From an environmental prospective, the project will not be using any chemicals in the process since it will be only by gravity concentration.

### 8.3 Capital Costs

Costs are estimated in United States dollars as at the first quarter 2010 and has accuracy of  $\pm 15\%$  i.e in line with the "order-of- magnitude" estimates. Capital costs related to the entire project, excluding owners's corporate costs and any contingency for further scope changes and project financial risk. Costs presented are for a 2800 tonnes per day throughput. Capital costs are inclusive of the processing plant required to produce gold, a power station, an accomodation village, a new 25km road connecting the mine to existing road network and mining equipment.

The total capital costs of the project are estimated at US\$7.92M. Table 8.1 below shows a breakdown:

	Costs US\$
Mining	2,500,000
Jig Plant	500,000
Centrifuge Plant	500,000
Washing Plant	200,000
Infrastructure	1,000,000
Miscellaneous	1,000,000
Indirect	1,500,000
Contingency	720,000
<b>Total</b>	<b>7,920,000</b>

**TABLE 8.1 CAPITAL COSTS ESTIMATE**

- Mining capital costs covers mining fleet, clearing, mine infrastructure and office setup.
- Infrastructure costs include the costs of site access road, accomodation, communication and water supply and transmission.
- Plant costs includes plant infrastructure, support services, power generation, mobile equipment and waste storage facilities.
- Miscellaneous includes items such as mobilisation and demobilisation, initial consumables, spares and commissioning assistance.
- Indirect costs include items such as Engineering, Procurement, Construction management and temporary facilities.
- Contingency of 10% is considered conservative, and reflects the level of engineering details.

### 8.4 Market Analysis

The gold price is hovering near record territory (TABLE 8.2) as nervous investors seek shelter from the barrage of negative economic news.

As Europe and America joust for the honor of the weakest currency, investors continue to accumulate gold. Some commentators are calling for a massive escalation in the gold price. To the extent that those commentators have been correct in the past, they will be right in the future. That is, the gold price is up five-fold in less than a decade. Those forces that have sustained a substantial increase in the gold price are still in effect. At the same time, there are market factors that keep the gold price from rising sharply. The most likely outlook is for a continuation of the pattern of the past decade.

An important element in the gold market is the central banks, which collectively hold about half of the global gold stock. The central banks are moving decidedly in favor of gold. Globally, there is a lot of support for gold. At the very least, the gold price is likely to hold its real value: that is, it will continue to increase in US dollar terms. Gold is likely to increase further in real terms, but counting on a big increase in gold should not be a fundamental investment premise.

Gold is gaining favor among conventional money managers who want the currency and inflation hedge that gold provides. At the same time, those managers want to generate a return on their investment, which is not assured by simply holding bullion. The obvious solution is to hold gold equities. However, the big companies are so popular among investment managers that they trade at about two-times net asset value. In effect, the share prices of the major gold companies already factor in a higher gold price.



**TABLE 8.2 5 YEAR GOLD PRICE**

## 8.5 Financial Evaluation

The TRI, Financial Model is a discounted unleverage cash flow model (DCF) of the Tamakay project which has been built in Excel. The model describes a base case and has the capacity to evaluate the impacts of variations in key inputs on financial metrics for the Tamakay project. The model uses net present value (NPV), internal rate of return (IRR) and payback period as its evaluation metrics.

The following assumptions about the project form the basis of the model:

- The capacity of the project is 0.896 Mtpa;
- The capital cost of the project has been estimated at US\$7.92M;
- Construction is scheduled to commence in 2011;
- Production is schedule to commence by mid 2011;
- The project has an expected life of five years and
- Ungeared with no debt financing.

## 8.6 Base Case Summary

The financial outcomes of the model for the base case indicate a robust project that will generate over US\$ 53.1 in free cash flow post tax over its operating life.

Over the life of the project, the cumulative undiscounted revenue streams from the sale of gold are US\$ 245M. The project will generate an average annual cashflow of US\$35 over the life of the project.

## 9.0 Future Work Programs

The current work plans and feasibility study report was the focus to dictate the future work plans. The work programs will continue with its exploration program to add value to the Tamakay Project. The outcome could see significant enhancement to the project economics. The future work programs are in line with the Company's aim to develop Tamakay as a best and low cost, long term, large scale producer of gold and diamonds.

*Work programs will include*

***Commence Environmental and Social Impact Assessment Studies:*** The success of any mining operation of this scale is contingent on the project meeting all social and environmental requirements. TRI has already applied for Environmental Authorization from the Environmental Protection Agency of Guyana and will be working closely with all the local authorities to plan the scope of these studies.

***Beneficiation Studies:*** As the company has developed a more in depth understanding of the geology of the Tamakay resource, new opportunities could be identified which could improve the gold and possible diamond recovery as well as optimizing grinding efficiencies.

***Improve Mine Schedule:*** Further detailed mine studies may result in less dilution in the mine schedule that could see an increase in the average gold head grade over the life of the mine.

***Convert Possible to Proven Reserves:*** At present, the mine schedule is based on a relatively small area of the total prospecting license. The company plans to intensify the exploration program with closer sampling density with the aim of converting possible resources to proven reserves to extend the life of the mine (primary mining).

***Define New Multi Element Resources:*** There is a genuine scope to define new multi-element resources with the Company's license area

