i. Basic Project Information

Project Name	**Masbate Gold Project – Processing Plant Expansion**
Location	Barangays Amoroy, Bangon, Capsay, Panique, Puro, and Syndicate, Municipality of Aroroy, Province of Masbate
Impact/Host Barangays	Barangays Amoroy, Bangon, Capsay, Panique, Puro, Lanang, Balawing and Syndicate, Municipality of Aroroy, Province of Masbate
Project Type	Processing Plant Resource Extractive Industry
MPSA Area No.	Patented Claims and Mineral Production Sharing Agreement (MPSA) Nos. 95-0097-V, 255-2007-V, 256-2007-V, 329-2010-V, and 219-2005-V.
ECC Ref. No.	ECC-CO-1808-0022 January 2019
Mineral Processing Permit	MPP-010-2007-V – PGPRC as MPP Holder 2nd Renewal April 03, 2018
Mining Method	Surface Mining Method
Process	Carbon-In-Leach (CIL) Cyanidation Process
Project Area Covered	2,548.4 hectares
Production Capacity	Existing Plant Capacity: 7.3 Million MT/y Proposed Plant Capacity: 9 Million MT/y Mine Extraction Rate: 34,500,000 Million MT/y

ii. Proponent Profile

Project Proponent	**FILMINERA RESOURCES CORPORATION (FRC)**
Main Office Address	3F Corinthian Plaza Bldg. 121 Paseo de Roxas, Legaspi Village Makati City
Contact Person	**Engr. Sulpicio B. Bernardo III** Vice President for Operations
Operator	**PHIL GOLD PROCESSING & REFINING CORP. (PGPRC)**

Main Office and Project Address	Brgy. Puro, Municipality of Aroroy Province of Masbate
Contact Persons	**Daniel Moore** President and General Manager **Eugene Occeña** Mill Manager

iii. Project Preparer

EPRMP Preparer	**AXCELTECHS, INC.**
Contact Person	Engr. Paulo Noni T. Tidalgo, EM, RN
Designation	Managing Director
EMB Accreditation	IPCO – 103
Address	10C, 20 Lansbergh Place 170 Tomas Morato Avenue, Quezon City
Contact Number	(+632) 3760043
E-mail Address	management@axceltechs.com

1.0 PROJECT LOCATION

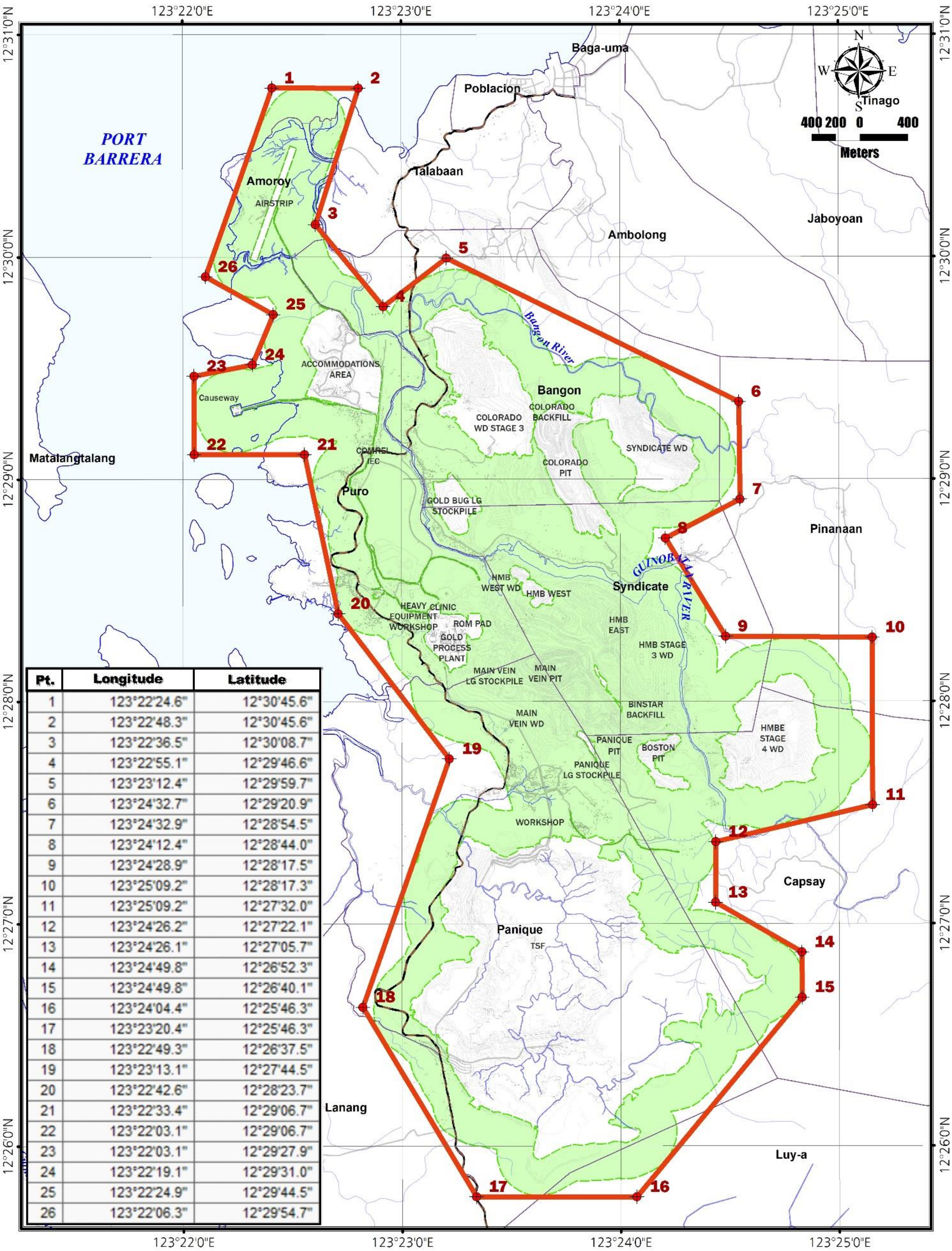
The proposed plant expansion project is located in Barangays Capsay, Panique and Puro Municipality of Aroroy, Province of Masbate, while the whole MGP Project is located in Barangays Amoroy, Balawing, Bangon, Capsay, Lanang, Panique, Puro and Syndicate, Municipality of Aroroy, Province of Masbate.

The project is located about 360 kilometers SE of Manila in the Municipality of Aroroy, Masbate Province**.** The Project is accessible by boat or by commercial plane. The MGP extracts gold ore by Hard Rock terrace or bench type mine and then processes it using the conventional carbon-in-leach (CIL) cyanidation method. The mining component is undertaken by Filminera Resources Corporation (FRC). FRC holds the MGP Environmental Compliance Certificate, the mining tenements (MPSA and Patent Claims), and surface rights of the Project.

Phil. Gold Processing & Refining Corp. (PGPRC) process the ore and holds the Mineral Processing Permit for MGP. It owns and operates the processing plant in the MGP. It is the exclusive buyer and processor of the gold ore mined by FRC.

Table 1 - Geographical Coordinates of Masbate Gold Project

Point	Latitude	Longitude
1	12°30’45.6”	123°22’24.6”
2	12°30’45.6”	123°22’48.3”
3	12°30’8.7”	123°22’36.5”
4	12°29’46.6”	123°22’55.1”
5	12°29’59.7”	123°23’12.4”
6	12°29’20.9”	123°24’32.7”
7	12°28’54.5”	123°24’32.9”
8	12°28’44”	123°24’12.4”
9	12°28’17.5”	123°24’28.9”
10	12°28’17.3”	123°25’9.2”
11	12°27’32”	123°25’9.2”
12	12°27’22.1”	123°24’50.8”
13	12°27’5.7”	123°25’10.7”
14	12°26’52.3”	123°25’3.9”
15	12°26’40.1”	123°24’49.8”
16	12°25’46.3”	123°24’4.4”
17	12°25’46.3”	123°23’20.4”
18	12°26’37.5”	123°22’49.3”
19	12°27’44.5”	123°23’13.1”
20	12°28’23.7”	123°22’42.6”
21	12°29’6.7”	123°22’33.4”
22	12°29’6.7”	123°22’3.1”
23	12°29’27.9”	123°22’3.1”
24	12°29’31”	123°22’19.1”
25	12°29’44.5”	123°22’24.9”
26	12°29’54.7”	123°22’6.3”



Pt.	Longitude	Latitude
1	123°22'24.6"	12°30'45.6"
2	123°22'48.3"	12°30'45.6"
3	123°22'36.5"	12°30'08.7"
4	123°22'55.1"	12°29'46.6"
5	123°23'12.4"	12°29'59.7"
6	123°24'32.7"	12°29'20.9"
7	123°24'32.9"	12°28'54.5"
8	123°24'12.4"	12°28'44.0"
9	123°24'28.9"	12°28'17.5"
10	123°25'09.2"	12°28'17.3"
11	123°25'09.2"	12°27'32.0"
12	123°24'26.2"	12°27'22.1"
13	123°24'26.1"	12°27'05.7"
14	123°24'49.8"	12°26'52.3"
15	123°24'49.8"	12°26'40.1"
16	123°24'04.4"	12°25'46.3"
17	123°23'20.4"	12°25'46.3"
18	123°22'49.3"	12°26'37.5"
19	123°23'13.1"	12°27'44.5"
20	123°22'42.6"	12°28'23.7"
21	123°22'33.4"	12°29'06.7"
22	123°22'03.1"	12°29'06.7"
23	123°22'03.1"	12°29'27.9"
24	123°22'19.1"	12°29'31.0"
25	123°22'24.9"	12°29'44.5"
26	123°22'06.3"	12°29'54.7"

Figure 1 – MGP Project Location Map

Figure 2 - Proposed Plant Expansion Project Location Map

1.1 Impact Area

The direct and indirect impact areas of the proposed expansion are based on the result of the assessment of the monitoring and baseline data. The identification of direct impact area was based on DAO 2017 – 15. The table below presented the summary of Direct Impact Areas based on the current and proposed expansion:

Aspect	Direct Impact Area
Water	- Receiving water bodies of the project - Underlying aquifer
Air	- Area near the periphery of the plant and mining area
Noise	- Area within the periphery of the plant and mining area
Terrestrial	- Vegetated portion within the project area coverage
People	- Barangays Amoroy, Bangon, Capsay, Panique, Puro, Lanang, Balawing and Syndicate, Municipality of Aroroy, Province of Masbate

2.0 PROJECT RATIONALE

From 2009, MGP project provided the following benefits:

- Employment to an average of 1,881 personnel annually of which, 1,259 or 67% are Aroroy residents.
- Total tax payments by FRC and PGPRC to the local and national government of P 1.795 billion and P 5.061 billion, or a total of P 6.857 billion.
- Total expenditures under the Social Development and Management Program (SDMP) for infrastructure, education, health, livelihood, and culture to the 8 host barangays of P 380.9 million - The annual average SDMP of the host barangays is nearly twice their combined internal revenue allotment (IRA) and 9 times their development fund.
- Beginning 2014, the SDMP was expanded to assist the other 33 neighboring barangays of Aroroy Municipality. The total expenditures for these barangays until 2017 reached P 68.3 million.
- The MGP also spent P 43.5 million for community development in areas outside of Aroroy.

With the new ball mill and enhancements on Process Plant piping/instrumentations, there is an **OPPORTUNITY** to increase Mill throughput from **7.3 Million Tons Per Annum** to **9 Million Tons**

Per Annum. The increase in throughput will provide opportunity for MGP to address the long standing concerns on **Low Grade Stockpiles**.

3.0 PROJECT ALTERNATIVE

3.1 Alternative Project Location

Since the project is already operating, selection of new project location will no longer be considered. The expansion project will focus on the installation of additional ball mill which will be connected to the existing process plant.

3.2 Mining Method

The depth of the pit and its location will depend on the exploration activities conducted by the company. Further, considering the type and location of mineral to be extracted, the only feasible mining method for the project is surface mining method, thus, there were no other alternative method considered for the project.

3.3 Plant Process

The current project operation utilizes the CIL technology, with the growing demand of gold within and outside the country, the company decided to maximize its operation by utilizing technology upgrade. However, since the project is already operating, there were no plans of changing the current plant process. The additional ball mill to support the increase in production capacity was connected and constructed to the existing mill plant.

3.4 Water and Power Supply Alternative

The mill plant's water requirement is taken from the Guinobatan water reservoir, the company is also considering the Bangon River as a water reservoir. However, it is roughly located 2 km northeast of the LWUA treatment plant. Its major advantage over the present site is the absence of small-scale miners and processing plants in catchment. Also, this is subjected for another ECC application.

Further, the current power source of the mill operation is the 35.5 MW powerplant. In case of emergency, the company has a standby gen set, the two 6.4 MW and three 5.6 MW generator sets.

3.5 Consequences of not Proceeding with Project

In terms of physical environment, the project will continue its current operation. However, it will be more efficient if the new ball mill will be utilized. In terms of socio economic, opportunities for employment provided by FRC and PGPRC extend to other places in the Municipality of Aroroy and the entire Province of Masbate. The SDMP is strictly implemented to assist the needs of the community. With no “project option”, the opportunity for community assistance is not possible.

4.0 PROJECT COMPONENTS

The FRC Processing Plant Expansion Project intends to increase throughput from a nominal 7.3 Million MT/y to 9 Million MT/y of the Masbate Gold Project.

In general, the facilities associated with the Project involves only the expansion of the existing MGP processing plant to treat a throughput of 9.0 Million MT/y at a P80 grind size of 150 µm with a leach residence time of 24 hours. This will be achieved primarily by the installation of an extra ball mill and associated equipment. Other major equipment upgrades and/or modifications include upgrades to the crushing circuit, pebble crushing circuit, pregnant solution storage, and additional water pumping.

Upgrades/modifications will be confined within the existing permitted area. No additional new area will be needed in the Plant.

- Ball Mill No. 1 & 2 were manufactured on 1979.
- The two mills were used in other projects prior to installation in MGP on 2008.

The existing mills in the Processing Plant. Arrangement from right to left: SAG Mill, BM No. 1, BM No. 2

Ball Mill No. 1

Figure 3 - Current Mill (1 & 2) Condition

There will be no modifications in the mining area

<u>FRC and PGPRC operate the Masbate Gold Project (MGP).</u>

FRC holds the mining rights and the Environmental Compliance Certificate for the project – ECC No. 9804-003-120C. The mining rights include the patented claims and Mineral Production Sharing Agreement (MPSA) Nos. 95-0097-V, 255-2007-V, 256-2007-V, and 329-2010-V. MPSA No. 219-2005-V of Vicar Mining Corporation (VMC) is now assigned to FRC as approved by the DENR Secretary dated June 26, 2019. FRC likewise holds Exploration Permit (EP) No. 010-2010-V and a host of MPSA and EP applications.

PGPRC owns and operates the gold process plant through Mineral Processing Permit (MPP) No. 010-2007-V.

The MGP's primary commodity is gold dore which consists mainly of gold and silver. The proportion of each precious metal is dependent on the ore feed grade. As an illustration, in 2016, the gold ore produced is roughly 46% gold and 53% silver. The gold dore is shipped to Swirtzerland for further refining.

Table 2 and ***Table 5*** present the existing and proposed project components

Table 2 - List of Existing Mining Components

Component	Description	Responsibility	Will require Changes or Modifications under this ECC Amendment
Open Pit Mines	Source of Gold ore for feed to the PGPRC Process Plant These are the sources of gold ore feed of PGPRC's process plant. They include the Colorado Pit and the Main Vein group of pits which consist of Boston, HMBE (Holy Moses Basalt East), HMBW (Holy Moses Basalt West), Main Vein, Panique, Montana Extension Pit and Colorado-Bangon Stage 3 WRD.	FRC	No.
Waste Rock Dumps (WRDs)	These store the waste rocks excavated from the open pit mines. For the Colorado Pit, the WRDs include the Colorado-Bangon to the west and the Syndicate to the east. For the Main Vein group, the WRDs to the west are the HMBW and MV WRDs. The HMBE Stage 3 and HMBE Stage 4 are located eastward. As of July 2019, the WRDs comprise a total area of 199 ha. With heights ranging from 60 to 145 m.	FRC	No
Low Grade ore stockpiles	This include the Goldbug low-grade stockpile which is located immediately southwest of the Montana Extension Pit and those south of Guinobatan River, namely: the Main, Panique, and	FRC	Yes

Component	Description	Responsibility	Will require Changes or Modifications under this ECC Amendment
	HMBE low-grade stockpiles. Their aggregate surface area is 50 ha. The heights range from 40 to 110 m.		
Heavy equipment workshop	Work bays, warehouse, and storage facilities located immediately north of the gold process plant.	FRC	No
Explosives magazine	This consists of two reinforced concrete buildings, one to store ordinary blasting caps and the other for dynamites.	FRC	No
Emulsion plant	Owned and operated by Orica Philippines, Inc., the facility produces bulk explosives for FRC's open pit mines. Apart from the manufacturing unit, the facility includes ammonium nitrate storage, office, workshop and amenities.	FRC	No
Mine stormwater drainage	Uncontaminated surface runoff is diverted away from mine workings and facilities. Surface runoff potentially contaminated with oil is contained in a centralized pond that drains to an oil and water separator. Surface runoff from the mine is conveyed to a series of sediment retention structures. Uncontaminated surface runoff is diverted away from mine workings and facilities. Surface runoff potentially contaminated with oil is contained in a centralized pond that drains to an oil and water separator. Surface runoff from the mine is conveyed to a series of sediment retention structures.	FRC	No
Settling pond	These are impoundments created usually by rock gabions which receive and detain mine surface runoff. During the detention,	FRC	No

Component	Description	Responsibility	Will require Changes or Modifications under this ECC Amendment
	the sediment suspended in the runoff settles to the bottom of the pond leaving a cleaner pond effluent.		
Tank Farms	The HFO fuel tank farm is located at the northwest corner of the dried old tailings ponds A, B, C, D, and E. The diesel fuel tank farm is located near the heavy equipment workshop.	FRC	No
Old Tailings Pond	The dried old tailings ponds A, B, C, D, E, and F of ACMDC. The aggregates plant, mining workshop, and helipad are sited at the southern part.	FRC	No
Material Recovery Facility (MRF)	The MGP segregates its domestic solid wastes into residual, food wastes, biodegradables, recyclables, and shredded paper. Separate storage areas for the recyclables and shredded paper are maintained. The food wastes and biodegradables are kept in separate compost pits inside the old dried tailings pond. Pending the approval of the application for a sanitary landfill by the EMB Region 5 office, the residual wastes are temporarily stored at the old tailings pond.	FRC	No

Table 3 - List of Existing Plant Components

Component	Description	Responsibility	Will require Changes or Modifications under this ECC Amendment
Gold process plant	The conventional CIL cyanidation plant has crushing, grinding, leaching, adsorption, elution, electrowinning, smelting, office, and storage facilities with allowable maximum production capacity of 7.3 Million Metric Tons/year	PGPRC	Yes
Power Plant	A heavy fuel oil power plant supplies power to a high-voltage switchboard which is distributed via 4,160 v to the process plant, TSF, and other ancillary loads. It consists of 3 x 6.4 MW and 3 x 5.5 MW units. The 1 x 5.5 MW unit was installed in 2017 to ensure that 2 units are on standby or maintenance while the 4 units are in operation. Currently the power plant has an approved Permit to Operate (PTO) capacity of 35.5 MW. However, as per the approved ECC the allowable plant capacity is 50 MW.	PGPRC	No
ROM (run-of-mine) pad	This level area receives the run-of-mine ore from FRC's open pits for feed to the primary crusher of the gold process plant.	PGPRC	No
Aggregates plant	The plan has a vibrating grizzly feeder, jaw crusher, cone crusher, product screen, belt conveyors, and control system. It produces	PGPRC	No

Component	Description	Responsibility	Will require Changes or Modifications under this ECC Amendment
	gravels, stemming for use in the open pit blast holes, and filter materials for TSF dam construction.		
Batching plant	This is a semi-stationary concrete batching plant located near the gold process plant will be reactivated. Its main components are aggregate, cement, and water batcher, four-compartment aggregate storage bin with weighing conveyor, pan type central mixer and swiveling conveyor feeder and hopper.	PGPRC	No
Guinobatan water reservoir	This was built by the former operator of the MGP, Atlas Consolidated Mining and Development Corporation (ACMDC), to supply water to its gold cyanidation plant. PGPRC continues to draw water from the reservoir for its plant make-up water elution water, and firewater.	PGPRC	No
Raw water treatment plant	Water from the Guinobatan River reservoir is treated in this plant. With a daily capacity of 200 m^3, the treatment process includes removal of hardness, coagulation and flocculation, and pH adjustment. Three-fourths of the treated water is for the plant equipment cooling water and elution heating water. The balance passes through multimedia filters and chlorination to produce potable water for emergency showers and domestic use.	PGPRC	No
Tailings Storage Facility TSF	The facility consists of dams and embankments which form the tailings storage area, emergency spillway, pipelines, and workshop area. Tailings solids settle to the storage bottom.	PGPRC	No

Component	Description	Responsibility	Will require Changes or Modifications under this ECC Amendment
	Tailings water is decanted. Some water is pumped back to the gold process plant either for reuse or treatment prior to discharge to Port Barrera. Currently, the dam height is 59 m, tailings storage area is 357 ha, and the free board being maintained is 3m. The ultimate dam height is 71m.		
Decant Water Treatment Plant	Located near the gold process plant, this facility treats the tailings decant water from the TSF at a maximum daily capacity of 24,000 m^3. The primary treatment is destruction and oxidation of free CN and meta-CN complexes to cyanate through application of sulfur dioxide and oxygen. The secondary treatment is molybdenum removal through addition of sulfuric acid and later by ferric chloride to co-precipitate molybdenum and to form flocculants for adsorption and micro-filtration. The treated wastewater is discharged at the causeway.	PGPRC	No
Plant Ponds	These include the raw water pond, process water pond, and event pond of the gold process plant.	PGPRC	No
Process Plant Offices	These include the Plant Security, warehouse, assay laboratory, and mill office.	PGPRC	No

Table 4 - List of Existing Mine and Plant Components (Shared)

Component	Description	Responsibility	Will require Changes or Modifications under this ECC Amendment
Causeway	The upgraded causeway, previously operated by ACMDC, receives all incoming and outgoing cargo for construction or ongoing operations. It also handles inbound and outbound MGP personnel, contractors, and visitors on board the ferry.	FRC and PGPRC	No
Airstrip	Built by ACMDC, the airstrip was upgraded by FRC and duly registered with CAAP. It accommodates weekly chartered flights from and to Manila.	FRC and PGPRC	No
Helipad	This is located immediately north of the clinic at the dried old tailings pond F.	FRC and PGPRC	No
ComRel/IEC Center	The ComRel Office and IEC Center where the MGP accomplishments are showcased and stakeholder presentations and consultations are held. It is located along the National Highway immediately before entering the main gate of the MGP.	FRC and PGPRC	No
Clinic	Located near the heavy equipment workshop and security office, the clinic has a consultation room, waiting room, and treatment room.	FRC and PGPRC	No
Floral Nursery	This supports the revegetation and rehabilitation activities of the MGP. The capacity is more than 70,000 seedlings. Three community organizations were contracted to provide supplementary seedlings.	FRC and PGPRC	No

Component	Description	Responsibility	Will require Changes or Modifications under this ECC Amendment
General Office	All MGP offices except those of Security and the mill are found at the General Office Building	FRC and PGPRC	No
Accommodations	This consists of the guesthouse and dining, staff houses, 300-man camp, and clubhouse.	FRC and PGPRC	No
Sewage Treatment Plant (STP)	Two STPs, one for the 300-man camp and another for the gold process plant area, process the daily sewerage discharge. The physical and biological treatment equipment and processing are screening, influent tank, sequencing batch reactor, and chlorine contact chamber. The sludge is treated through an aerobic sludge digester. Dosing of the system with Ecozyme further breaks down the sewage, fats, and associated odors.	FRC and PGPRC	No
Hazardous Wastes Storage	This consists of bunded, covered, and labeled storage for specific hazardous waste types (i.e., used hydrocarbons, oil contaminated materials, oil filters, used batteries, busted fluorescent lamps, expired paints, and chemicals, etc.). The storage is temporary pending haul-out by accredited DENR-EMB waste hauler or treater. A waste manifest is maintained for individual waste types.	FRC and PGPRC	No
Roads	These connect the open pit mines, WRDs, low-grade ore stockpiles, process plant area, offices and workshops, causeway, airstrip, and accommodation areas. The roads are regularly sheeted, graded, cleared of vegetation along the sides, and provided with drainage channels.	FRC and PGPRC	No

Table 5 - List of Proposed Project Components

Component	Description	Responsibility
Gold process plant	The conventional CIL cyanidation plant has crushing, grinding, leaching, adsorption, elution, electrowinning, smelting, office, and storage facilities with proposed production capacity of 9 Million Metric Tons/year. The proposed modification will include: -New ball mill to increase milling capacity -Transfer pumps to transfer slurry from existing milling circuit to new ball mill circuit -Improvements to product screen on supplementary crusher for higher throughput -Bigger Drive on coarse ore stockpile conveyor -Bigger drive on mill feed conveyor and minor chute modifications -Larger pebble crusher installation to replace existing pebble crusher -Additional pregnant solution tank to increase gold room stripping capacity	PGPRC

5.0 PROCESS TECHNOLOGY OPTIONS

5.1 Mining Operation

The mine will be a conventional surface mining similar to Hard Rock terrace or bench type mine. Its operations encompass drilling holes with large diameter (32 to 46 cm) blast holes, blasting with either explosive slurries or ANFO (ammonium nitrate/fuel oil), and loading the ore onto large off-road trucks with large cables and hydraulic shovels and wheel loaders. Waste may also require blasting. Waste will be either backfilled to the mined-out pits or placed on waste dumps that exist from past mining activity. The overall stripping ratio is estimated to be less than 2:1.

During the mining operations, the following will be observed.

- Any available and useful topsoil will be stripped (or stockpiled near the pit), using bulldozers, loaders/ excavators and rear dump trucks;
- Competent waste will be drilled and blasted;
- The waste will be excavated in benches using large hydraulic excavators and loaded into rear dump trucks. Material from the initial works will be transported out of the pit and either used to backfill other pits or placed in nearby waste dumps;
- The exposed ore will be drilled and blasted. The ore will be loaded into rear dump trucks by excavator for transport to the process plant hopper;
- Stockpiled low-grade materials will be processed;
- The landform design will be based on a maximum slope of 20 o (about 36%, or 3v:1h). The existing waste dumps from historical mining have angle-of-repose slopes of about 38 o (or 75%), so the slopes will be more stable against the forces of erosion in future;
- The ex-pit and in-pit dumps will be progressively shaped to their final landform, top soiled and seeded with native grass, shrub and tree seed; and
- Drainage structures such as graded banks and rock-lined waterways will direct runoff to sediment dams constructed at the base of the dumps and within the rehabilitated landform.

5.2 Plant Process

The PGPRC circuit comprises: crushing, grinding, leaching and adsorption, elution, electro-winning and smelting gold recovery stages, tails detoxification stage prior to disposal in a tailings storage facility (TSF). To maintain the integrity and stability of the TSF, a reclaim water treatment plant treats a portion of the decant water from the tailings prior to discharging to the ocean.

Major components include (1) C160 Primary Crusher, (2) 8.5 MW SAG Mill and 315 kW Pebble Crusher, (3) 2 x 3.6 MW Ball Mills (5) 2x 3200m3 and 4 x 2900m3 leach tanks, 8 x 2900m3 adsorption tanks, (5) AARL Elution and recovery, (6) 35.5 MW HFO powered Power Plant and (7) 3 stage Supplementary Crushing Plant.

The Masbate upgrade will increase the design throughput of the existing plant to a nominal average of 7.3 Mtpa to 9.0 Mtpa. The expansion will be achieved through an upgrade of the existing comminution and classification circuit with the addition of major component on grinding system; 1 x 6.0 MW Ball Mill. Other upgrades will include the replacement of the existing pebble crusher with a larger unit (450 kW), additional tailings pumping, upgrades on conveyor drives, and utilization of both the existing primary crushing circuit and supplementary crushing circuit. Few modifications at supplementary area will be implemented which includes the bypassed of crushers through removal of primary screen panels and product screen head chute modifications. Percentage of mill feed that requires tertiary crushing can be varied to maximize the milling rate.

These unit processes and planned upgrades are well established and conventional in the gold industry. The operating strategy proposed are consistent with practices in the gold industry for treatment of ore types and mineralization with similar metallurgical characteristics.

The new milling circuit consisting of a new ball mill will operate in closed circuit with the new cyclone cluster that will be installed to service new ball mill (size identical to the original Krebs gMAX cyclone cluster). By the installation of a parallel ball mill and classification circuit, feed to the new ball mill will be varied when; (1) new ball mill is operational with 1 existing mill offline at nominal circulating load, (2) new ball mill is operational with 1 existing mill offline at maximum circulating load, (3) new ball mill is operational along with the two existing ball mills. This will give room for maintenance activities for two old mills.

The mill head grade for the past 10 years operation of the plant is presented in ***Table 6***

5.2.1 Current Operation

5.2.1.1 Crushing

There are two crushing circuits: the primary and supplementary. The supplementary circuit is operated during a primary crusher shutdown or as required by the plant.

The primary circuit has a C160 jaw crusher which reduces the ore feed to a size of less than 150 mm at 1,000 t/hour. The supplementary circuit has a three-stage crushing which reduces the harder, more competent ore to a size of less than 14 mm at 400 t/hour. The first-stage C125 jaw crusher has a close side setting of 125 mm; the secondary GP200 cone crusher with 50 mm; the tertiary HP4 cone crushers with 14 mm.
The crushed ore discharges into a surge bin.

5.2.1.2 Grinding and Classification

This consists of a SAG mill and two regrind ball mills in closed circuit with the hydrocyclones. The target P_{80} sizing is 150 µm. The required treatment rate is 800 to 1,000 dry t/hour.

The cyclone overflow at – 150 µm discharges into a vibrating trash screen with 0.80 mm aperture to remove woodchips, trash, and oversize materials. At the leach feed tank, 20% lead nitrate ($Pb[NO_3]_2$) solution is added at 150 kg/t of ore processed.

5.2.1.3 Leaching and Adsorption

A pre-aeration tank, 5 agitated leach tanks, and 8 agitated adsorption tanks comprise this circuit. At the pre-aeration tank, oxygen gas is injected into the leach feed via three oxygen contactors. This will speed up the process of gold dissolution.

Gold leaching occurs at the next five tanks with the introduction of cyanide solution at 0.45 to 0.50 kg/t. Pulp from the fifth leach tank then flows to the adsorption section.

Regenerated carbon is added to the eighth adsorption tank. The dissolved gold adsorbs onto the surface of the carbon. The loaded carbon is transferred to the preceding tank by a vertical-spindle, recessed-impeller, centrifugal pump. An interstage screen at this tank prevents the transfer of carbon prior to pump activation[1]. The gold adsorption and loaded carbon transfer are undertaken at each adsorption tank countercurrent to the pulp transfer.

At the first adsorption tank, a recessed impeller pump transfers the slurry to the loaded carbon screen. The slurry passing through the screen gravitates back to the tank. The screened carbon goes to the elution circuit.

Slurry from the eighth adsorption tank discharges into a carbon safety screen. The screen undersize goes to the tails tank. The oversize carbon returns to the eighth tank.

5.2.1.4 Elution and Carbon Regeneration

The screened carbon is brought to the acid wash column. HCl at 5% strength is pumped into the column to remove the organic foulants. Subsequently, the carbon goes to the elution column where the carbon is stripped of the adsorbed gold. The Anglo-American Research Laboratory process which uses caustic soda and concentrated cyanide solution at 120°C is employed.
The eluate solution goes to electrowinning and smelting. The eluted carbon is pressure transferred to a dewatering screen. The barren carbon discharges into a kiln feed hopper and then a horizontal rotary kiln where it is reactivated. The kiln is a distillate fired unit with a nominal 500 kg/hour throughput. Carbon will discharge into a carbon quench tank prior to re-introduction to the adsorption tank via the carbon sizing screen.

5.2.1.5 Electrowinning and Smelting

The pregnant solution from the elution column is recirculated through three electrowinning cells. Each cell contains 12 woven stainless steel cathodes. Upon completion of the electrowinning, the barren eluate is pumped back to the leaching and adsorption circuit.

The gold-bearing cathodes are periodically removed from the electrowinning cells and desludged. The gold-silver sludge will be filtered and dried prior to mixing with fluxes and smelting to produce gold-silver bullion.

An additional slag treatment facility was commissioned in December 2016 to recover the precious metals trapped in the slag.

[1] Since carbon is much larger than the ore particles, it can be easily separated by screening.

5.2.1.6 Cyanide Recovery and Detoxification

The slurry from the tails tank undergoes detoxification prior to discharge to the TSF. This is achieved through the injection of Caro's acid into the tails pipeline prior to the tails pump. Caro's acid is a mixture of 98% sulfuric acid (H_2SO_4) and 70% hydrogen peroxide (H_2O_2) in 2:1 molar ratio designed to meet the target weak acid dissociable (WAD) cyanide (CN) residue of less thean 50 ppm. An online WAD analyzer measures the WAD CN on the slurry priot to the addition of Caro's acid.

5.2.1.7 Decant Water Treatment Plant

For the integrity and stability of the TSF dam, decant water is recycled back to the plant. The bulk is to constitute 85% of the process water. The residual is treated in a water treatment facility. The facility implements cyanide destruction, metal removal, microfiltration, and pH adjustment so that the effluent meets the environmental standards for discharge to Port Barrera.

The water treatment facility was upgraded in February 2017. An Actisoft system for water clarification and softening was added to produce elution and cooling tower make-up water and water for various uses such as emergency shower.

Table 6 - Mill Head Grade

Mill Head Grade	January	February	March	April	May	June	July	August	September	October	November	December
Y2009				1.05	1.12	1.30	1.52	1.32	1.30	1.30	1.32	1.02
Y2010	1.24	1.19	1.47	1.22	1.23	1.15	1.24	1.17	1.23	1.20	1.19	1.23
Y2011	1.05	1.08	1.06	0.95	1.01	1.18	0.87	0.97	0.92	1.10	1.05	1.17
Y2012	1.14	1.08	1.13	1.04	1.15	1.05	1.02	0.97	1.14	0.93	1.02	1.22
Y2013	1.11	1.05	1.03	1.14	1.16	1.28	1.10	1.02	1.02	1.00	1.05	1.05
Y2014	1.02	0.96	1.09	1.15	1.20	0.99	1.13	1.11	1.14	1.29	1.38	1.40
Y2015	1.26	0.98	0.92	0.87	1.01	0.99	0.90	1.05	1.05	1.17	1.16	1.25
Y2016	1.15	1.26	1.37	1.45	1.39	1.35	1.34	1.09	1.14	1.13	0.97	1.15
Y2017	1.40	1.27	1.17	1.10	1.14	1.12	1.11	1.03	1.15	1.18	1.31	1.30
Y2018	1.11	1.20	1.21	1.24	1.29	1.34	1.32	1.48	1.36	1.50	1.37	1.03
Y2019	1.34	1.40	1.13	0.98	1.29	1.29	0.97	0.93	0.86	0.96	1.04	1.00

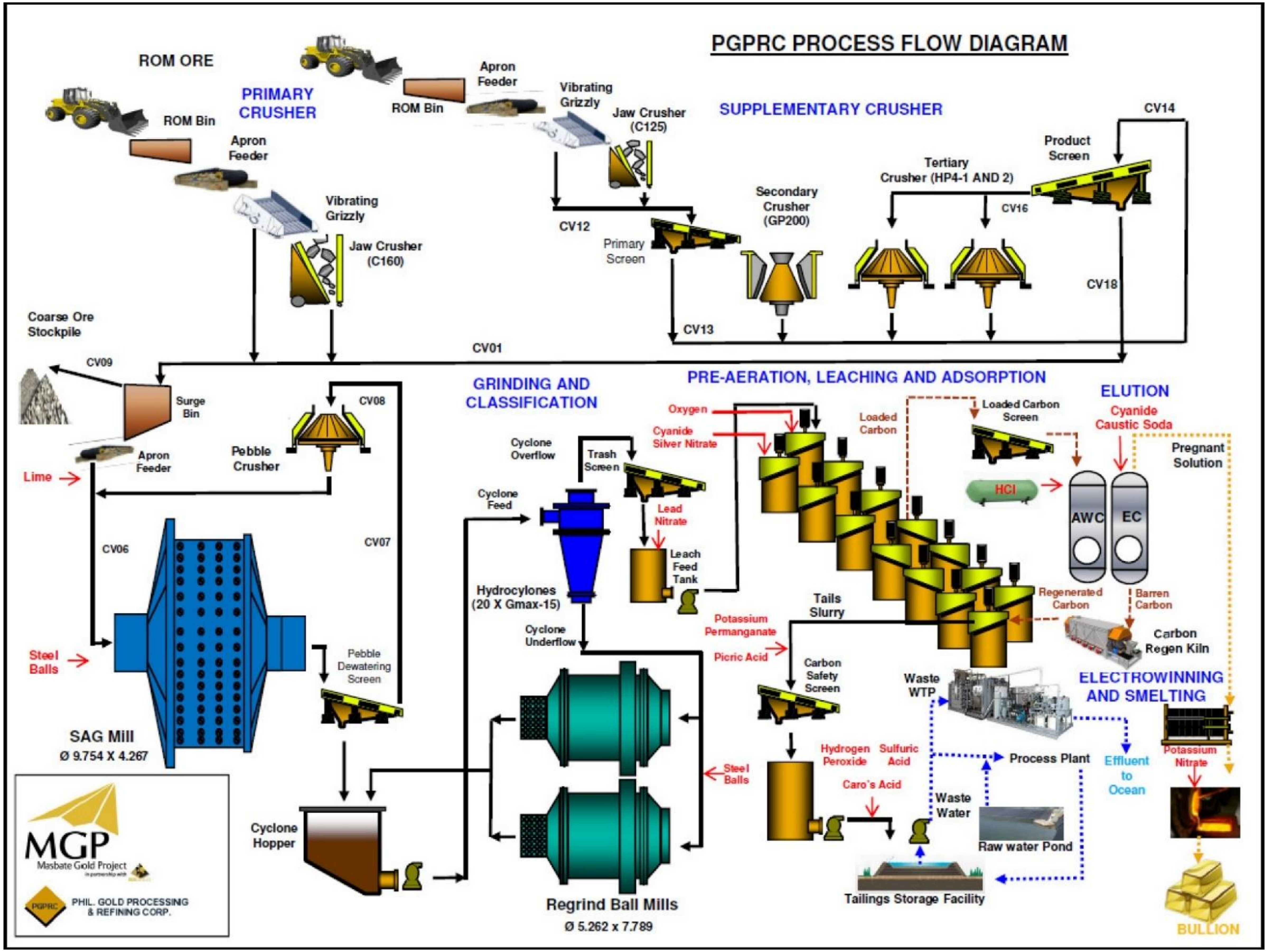


Figure 4 - Process Flow Diagram – Current Operation (source: PGPR)

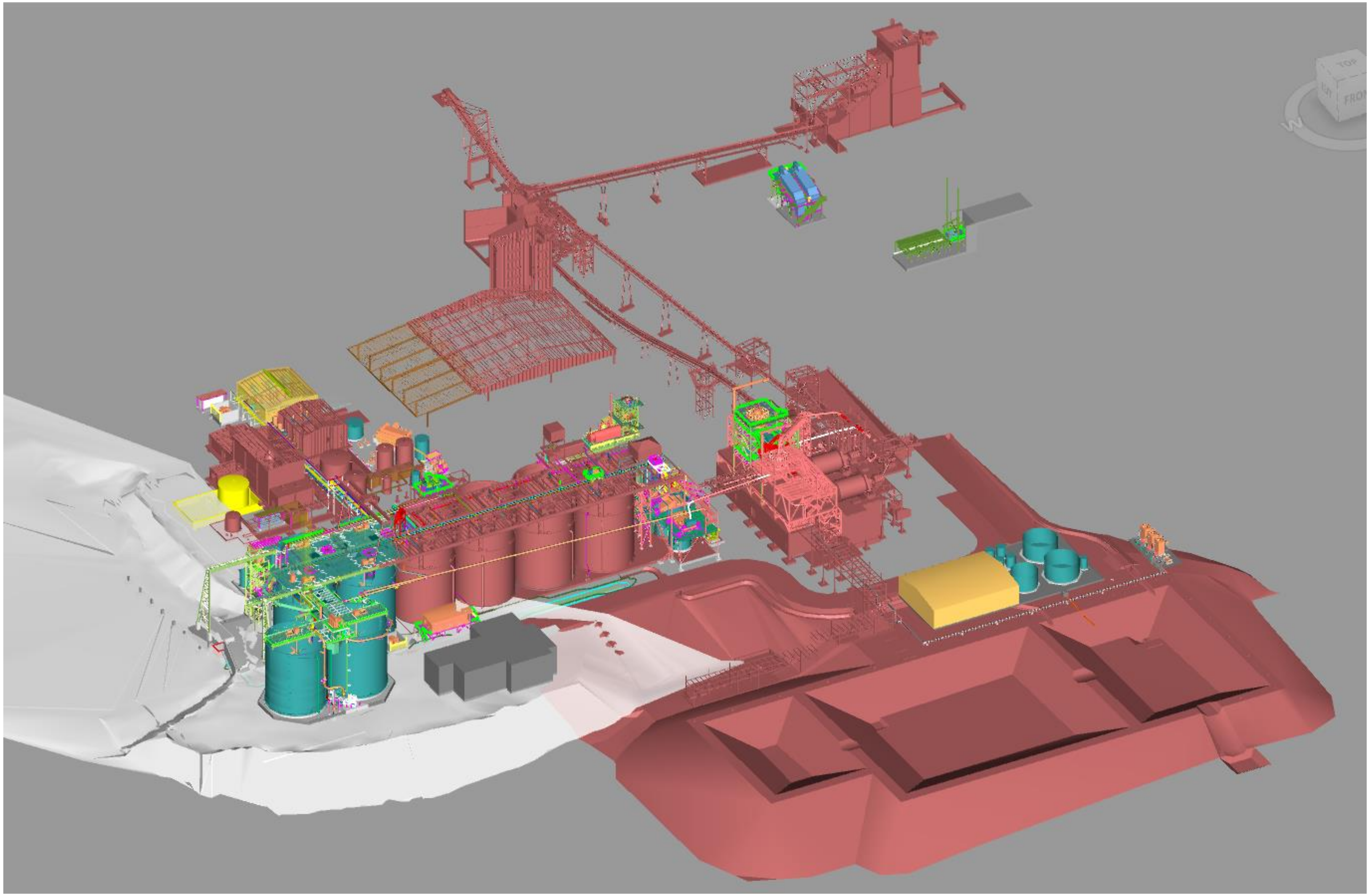


Figure 5 - Current Plant Layout

5.2.2 Proposed Project Expansion

5.2.2.1 Crushing

PGPRC has two Crushing circuits – the primary and the supplementary crushing plants. The principal crushing plant is the primary crusher while the supplementary crusher is utilized to maintain the target throughput in the event of primary crusher shutdown or as required by the milling circuit. The percentage of mill feed that requires tertiary crushing will vary to maximize the milling rate.

At the primary crushing plant, Run-Of-Mine Ore from the mine is dumped to the ROM Bin with 800mm stationary grizzly opening. This is fed to the crushing section by an apron feeder at the rate of 1000 Mt/hr. A vibrating grizzly with finger openings of 150 mm scalps the ore before it drops into a C160 jaw crusher with close side setting of 160 mm. Both the undersize material from the vibrating grizzly and jaw crusher product drops into CV-01 belt conveyor. It is equipped with pulsating dust collector and weightometer to measure the crushing throughput into a surge bin. The surge bin has a by-pass chute into CV-09 belt conveyor that provides stockpiling capability for the extra crushing tonnage and a feeding point for the grinding section during crushing plant shutdowns. The crushing plant will be scheduled to be available for operation 24 hours per day, 7 days per week. Equipment has been selected to achieve a crushing plant availability of 90%.

5.2.2.1.1 Supplementary Crusher

The supplementary crushing plant is capable of producing 400 t/h of crushed ore. It is a 3-stage crushing circuit designed to treat harder, more competent ore to a product size of 14-15 mm. Equipment has been selected to achieve a crushing plant availability of 70%.

The ore is fed into the ROM bin and is withdrawn via an apron feeder. It then discharges to the vibrating grizzly (90 mm aperture) which takes out the fines and delivers the oversize into the C125 jaw crusher with a close side setting of 125 mm. The vibrating grizzly undersize and jaw crusher product drop into CV-12 and then discharges to the primary screen. The primary screen scalps the ore before it is fed to the GP200 secondary cone crusher with a close side setting of 62 mm. The primary screen undersize and the secondary crusher products fall to CV-13. The ore particles then conveyed to CV-14 which distributes the feed into the two product screens. The product screen oversize is re-circulated to the circuit through CV-15 which expels tramp metal with a Belt Magnet before discharging to CV-16. Ore from CV-16 drops to a surge bin and is withdrawn by means of two belt feeders that deliver feed to the HP4 tertiary cone crushers. Product from the final crushing stage also discharges to CV-13. Particles below 14 mm pass through the product screen directly to CV-17 and finally exit the circuit through CV-18, which is equipped with a weightometer then discharges to conveyor belt CV-01 and combined with the primary crusher product.

Series of modifications will be implemented at supplementary circuit for the proposed upgrade. Product screen head chute modifications and possible bypassed of crushers through removal of primary screen panels will be done to meet operational requirements.

5.2.2.1.2 Crushed Ore Stockpile and Reclaim

The crushed ore stockpile feed conveyor (CV-09) will discharge ore directly onto a coarse ore stockpile (COS) providing 24 hours capacity. Front-end loader is utilized to direct stockpiled material to the mill feed conveyor through surge bin apron feeder when required.

5.2.2.1.3 Grinding and Classification

The circuit consists of a SAG mill and two (2) ball mills in closed-circuit with the hydrocyclones. Product classification is carried out by hydrocyclones with a target P80 sizing of 150 microns (µm). A treatment rate of about 800-1000 dtph is required.

Crushed ore on CV-01 conveyor belt discharges into a surge bin. The surge bin apron feeder speed is controlled to withdraw crushed ore at the rate dictated by the SAG Mill. The SAG mill grates will contain pebble ports. The SAG mill will discharge onto the pebble dewatering screen with screen underflow combining with ball mill discharge in a common mill discharge hopper. Pebble screen oversize will be conveyed to the single pebble crusher for size reduction. The facility exists to bypass the pebble crusher and return pebbles to the mill feed conveyor when required.

The slurry is pumped to the cyclone cluster to separate the minus 150 microns product (cyclone overflow) from the plus 150 microns (cyclone underflow). CUF slurry (course fraction) is distributed to the two ball mills for further grinding. The discharge from the ball mill will be laundered to the common mill discharge hopper. Water is added at this point to obtain the required solids density for the hydrocyclone operation. The two ball mills will operate in closed circuit with hydrocyclones with an allowance for a proportion of the cyclone underflow to be directed to the SAG Mill feed when required.

The cyclone feed pumps are provided with variable speed drives and will pump the mill discharge to a cluster of 22 model gMAX 15 cyclones. Twenty cyclones will operate normally, with two stand-by cyclones.

5.2.2.2 New Ball Milling

The new milling circuit consists of a new ball mill (330-ML-001) operating in closed circuit with a new cyclone cluster (20-CY-001 / 020). Feed to the new milling circuit will be supplied from the existing Cyclone Feed Hopper (20-HP-001) via the new Mill Slurry Transfer Pumps (20-PP-063 / 064). This transfer will be controlled by mass flowrate required to the new ball mill. Cyclone overflow from this new milling circuit will be pumped from the new Ball Mill #3 Cyclone Overflow Hopper (20-HP-004) to the existing Trash Screen Feed Box (40-BX-001) via the new Ball Mill #3 Cyclone Overflow Transfer Pumps (20-PP-069 / 070). Refer to Process Flow Diagram in Figure 6.

The new cyclone cluster is bottom fed through a common feed distributor and consists of 20 x 380 mm (gMax15) cyclones. Slurry from the cyclone cluster underflow launder (20-LA-003) gravitates to the Ball Mill #3 Underflow Boil Box (20-BX-018), whilst slurry from the cyclone overflow launder (20-LA-002) gravitates to the Ball Mill #3 Cyclone Overflow Hopper (20-HP-004) via the Ball Mill #3 Cyclone Overflow Boil Boxes (20-BX-021 / 022). The cyclone feed mass flow will be calculated from flow and density measurements. The cyclone feed pressure will be measured and the circulating load will be displayed on the HMI (Human Machine Interface). The number of operating cyclones will be determined by the operating pressure, with the number of cyclones in use being varied, through the manual opening or closing of the respective cyclone isolation feed valves, to maintain the desired cyclone operating pressure.

5.2.2.3 Ball Mill #3 Cyclone Overflow Pumping Overview

Due to the process plant layout, gravity flow of cyclone overflow from the new Ball Mill #3 Cyclone Cluster is not possible. Instead, cyclone overflow will gravitate to the Ball Mill #3 Cyclone Overflow Hopper (20-HP-004), and then subsequently pumped to the Leach Trash Screen Feed Box (40-BX-001) by the Ball Mill #3 Cyclone Overflow Transfer Pumps (20-PP-069 / 070).

The grinding circuit will operate 24 hours per day, 7 days per week. The grinding and classification plant have been designed on the basis of an availability of 91%.

5.2.2.4 Leaching and Adsorption

The PGPRC plant uses the conventional gold extraction process composed of six (6) tanks dedicated for leaching followed by eight (8) adsorption tanks for carbon adsorption process. Tankage were designed to achieve 24 hours residence time at the nominal throughput rate of 1000 tph.

Leaching and adsorption circuit was configured having a pre-aeration tank, five (5) leach tanks and eight (8) adsorption tanks. The pre-aeration is done through the injection of oxygen gas into the pre-aeration tank via three oxygen contactors supplied by Hyperjet while the oxygen is supplied by the DOCS 1500 Vacuum Swing Adsoprtion (VSA) machine supplied by PCI. Purpose is to lift the existing oxygen concentration on the tanks to speed up the process of gold dissolution.

The cyclone overflow slurry from existing milling and new ball milling circuit (-150 microns) reports to the vibrating trash screen with 0.80 mm aperture to remove woodchips, trash, and oversize materials before it is pumped to the leach tank. An auto-sampler cuts samples from the slurry stream before it discharges to the leach tank. Slurry samples are then composited every 12 hours for gold analysis by SGS Laboratory. Twenty percent (20%) lead nitrate solution is introduced to the leach feed tank at an addition rate of 200 kg/t of ore processed.

To obtain a more efficient control on the amount of sodium cyanide being added to the CIL circuit during leaching process, cyanide dosing control was changed to weight ratio control where in a specific set-point in grams (NaCN) per ton (ore) unit will be nominated by the operator into the SCADA (DCS). The program will then send a signal to the flow controller of the cyanide dosing pump on how much cyanide will be pumped into the leaching tank based on the current weight of the fresh ore feed entering the circuit. Guided by our online cyanide analyzer (which is the TAC 1000) which provides an update on the actual cyanide concentration inside the leach tank every 20 minutes, the control operator can then adjust the cyanide dosing rate set-point to a level which will be based on the minimum target residual cyanide concentration on the exiting tails slurry.

The tails launder flows to a similar auto-sampler as the leach feed stream to allow representative sampling of tails slurry submitted to SGS Laboratory. Both analysis of leach feed slurry and tails slurry will be used in calculating the gold recovery of the plant operation.

Carbon advance in the CIL tanks will be carried out by vertical-spindle, recessed impeller, centrifugal pumps. Similarly, a recessed impeller pump will transfer slurry from the first CIL tank to the loaded carbon screen. The slurry passing through the screen will gravitate back into the first CIL tank. The screened carbon will be transferred to the elution circuit.
Interstage screening will be achieved using vertically mounted, cylindrical, mechanically wiped screens. A travelling portal crane will facilitate removal of the interstage screens for maintenance. Access to the carbon transfer pumps and agitator motors will also be achieved using this crane. Maintenance to the agitator gearboxes and wetted components will be carried out using a mobile crane.

Slurry from the last CIL tank discharges onto a carbon safety screen. The safety screen undersize gravitates to the CIL tails tank and being pump to tailings storage facility (TSF). Carbon addition to the last CIL tank will be via the carbon sizing screen. The sizing screen undersize will gravitate to the CIL tails launder and oversize carbon will fall directly into the last CIL tank.

Spillage from the circuit will be contained within a bunded concrete area and returned to the process via vertical spindle sump pumps.

No major changes are expected or required for the CIL circuit except for some improvements on interstage screening to meet operational and maintenance requirements.

5.2.2.5 Elution and Carbon Regeneration

The elution process starts with carbon harvest which washes and cleans the carbon before it flows into the 12T capacity acid wash column. Hydrochloric acid at 3% strength is pumped into the acid wash column to remove most of the organic foulants. After acid washing, the carbon is transferred to the elution column to strip the carbon of adsorb gold. Gold adsorbed unto the carbon is removed by soaking with caustic soda and concentrated cyanide solution at 120 degrees centigrade at 4 bed volumes into the pregnant solution tank (220 m3). Anglo-American-Research-Laboratory process is employed in the plant. The eluate solution is then circulated into the electrowinning cells to recover the gold unto stainless steel wool.

Eluted carbon will be pressure transferred from the elution column to a dewatering screen located above the reactivation kiln feed hopper. The barren carbon will discharge from the carbon dewatering screen into a kiln feed hopper prior to reactivation in two (2) horizontal rotary kiln. The regeneration kiln is a distillate fired unit, capable of a nominal 600-1,100 kg/hr and 600-750 kg/hr throughput for both regeneration kiln 1 and 2 respectively.

A vertical shaft sump pump will recover spillage from the sloping floors of the elution and carbon regeneration areas.

In line with upgrade, an additional pregnant solution tank (220 m3) will be installed with new pregnant solution pump and barren eluate pump to facilitate the completion of two strips per day. Online of additional tank will be determined by timing of harvest and stripping schedule which is highly dependent on carbon movement and circuit carbon loading.

Other than a piping tie-in on the Heat Recovery Exchanger (60-HX-001) discharge pipeline in order to feed the new pregnant solution tank, no existing equipment or process will be modified during the upgrade project; hence, no changes to the control functionality of the existing acid wash, elution circuit, carbon regeneration, or gold room are required.

5.2.2.6 Gold Room

The eluate will be recirculated through three electrowinning cells, each containing 18 woven stainless steel cathodes. At completion of the electrowinning cycle, the barren eluate will be pumped back to the CIL circuit.

The gold bearing cathodes will be periodically removed from the electrowinning cells and desludged. The gold/silver sludge will be filtered and dried prior to being mixed with fluxes and smelted to produce gold/silver bullion.

A floor sump fitted with a vertical shaft pump will provide clean up and drainage facility.

The precious metals trapped in the slag are processed and recovered through existing Slag Treatment facility. In practice, this slag is reprocessed by sending back to the milling circuit, which in effect is ineffective. The slag contains gold prills which are difficult to recover in the leaching circuit and basically affect the head grade in the circuit, and may result to high variance in gold reconciliation.

No changes to the control functionality of the existing electrowinning circuit are envisaged, with the exception of pregnant solution and barren eluate pumping due to the addition of Pregnant Solution Tank No. 2. This tank will be added to allow for two complete strips to be carried out in a 24 hr period. This addition necessitated the requirement for installation of actuated on / off valves on the pregnant solution and barren eluate pumping discharge lines from both the existing and new tankage, along with actuated on / off valves on the pregnant solution feed lines to the tanks. Pressure Relief valves have been incorporated into the pump discharge lines to eliminate pump lock-in on zero flow.

5.2.2.7 Cyanide Recovery and Detoxification

Tails slurry will undergo a detoxification process prior to discharge to tailings storage facility (TSF). Cyanide detoxification is achieved through the addition of Caro's acid injected directly into the tails pipeline located before the tails pump. Caro's acid is a mixture of 98% sulfuric acid and 70% hydrogen peroxide in 2:1 molar ratio designed to meet the target WAD CN residue of less than 50ppm. The Caro's acid plant comprises of two (2) sulfuric acid storage tank, hydrogen peroxide

ISO tank and a closed reactor module. An online WAD analyser measures the WAD cyanide on the tails slurry prior to Caro's acid addition which optimizes detox reagent addition.

Spillage from the circuit will be contained within a bunded concrete area and returned to the process via vertical spindle sump pumps.

No changes will be made to the existing control functionality.

5.2.2.8 Water Treatment Plant

To maintain the integrity and stability of the tailings storage facility, decant water is recycled back to the plant for process use and a portion is treated in a water treatment facility. Feed water goes through cyanide destruction, metal removal, microfiltration and pH adjustment processes designed to meet the environmental standards before discharging the effluent to the sea.

Raw water is also being treated in a treatment facility where a system called Actisoft was made available for water softening process that was customized to handle water clarification at the same time. Plant produced desired volume of elution and cooling tower make-up water and water for various usages such as emergency shower from river water at Masbate Gold Mine.

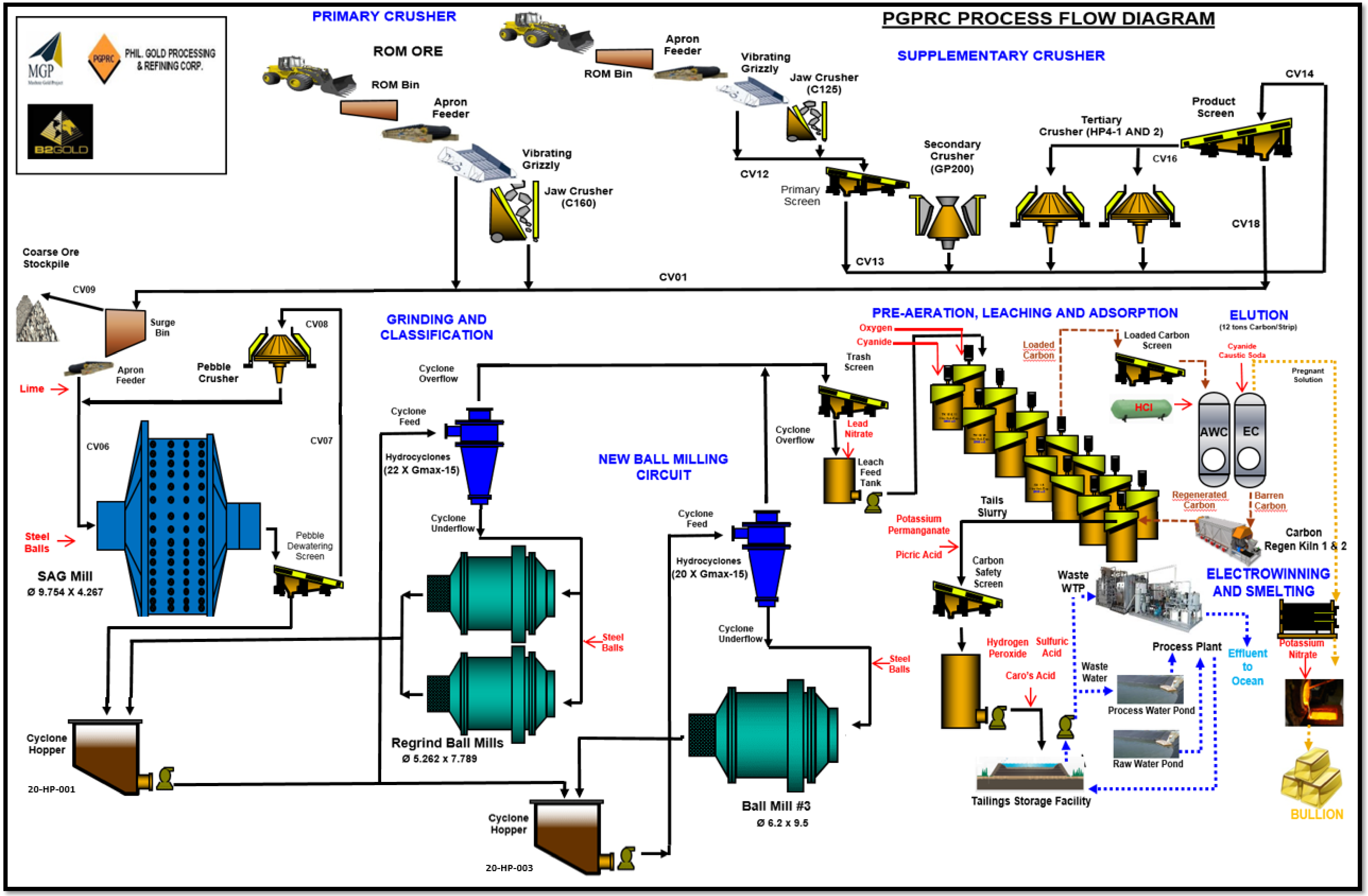


Figure 6 - Process Flow Diagram – Proposed Operation

6.0 MAJOR IDENTIFIED IMPACT AND MITIGATION MEASURES

Impact	Mitigation	Residual Impact
Contamination due to Accidental spills & leaks of solutions/ chemicals.	a. Regular monitoring of toxic gas which can be corrected immediately with pH adjustment. b. Use of Chemical Spill Kits to contain spills. c. All chemical preparation area are bunded & spills are discharged to emergency/event pond area. Monitoring and care/ maintenance of emergency pond. d. Proper collection & storage of hazardous wastes & transported/treated by an EMB accredited company. Monitoring and care /maintenance of storage area. e. Use of appropriate PPE of all employees (e.g. spill proof suits). f. Conduct appropriate training on workers.	Chemical spills and leaks are continually evolving risk. This requires continual monitoring and implementation of mitigating measures.
Noise & vibration brought about by Mill plant operation	a. Use rubber liner & wearing of appropriate hearing protection. Vibration damper are inherent machine installation design. Monitoring and care / maintenance of dampers. Use of appropriate PPE (e.g. ear plugs).	The Noise and vibration are unavoidable impact of Mill Plant operation. However, it can be minimized by applying mitigating measures and regular maintenance of equipment.
Generation of solid wastes	a. Use of segregation bins. b. Conduct appropriate training on all employees. c. Implementation of Solid Waste Management.	Solid wastes generation is inevitable impact of the Mill Plant operation. However, contamination can be alleviated through proper solid waste management.

7.0 SUMMARY OF ENVIRONMENTAL MONITORING PLAN

Key Environmental Aspects per Project Phase	Potential Impacts per Environmental Sector	Parameters to be Monitored	Sampling & Measurement plan			Lead Entity	Annual Estimated cost	EQPL Management Scheme			
			Method	Frequency	Location			EQPL[1] Range		Management Measure	
								Action	Limit	Action	Limit
II. Operation Phase											
Milling Operation	• Siltation and sedimentation • Water pollution	• TDS • TSS • pH • DO • Cyanide • Heavy metals (As, Cd, Cu, Dis_Cu, CN_Free, Hg, Cr, Ni, SB, Zn, Pb and Fe)	Gravimetric Turbidity meter calibrated to TSS pH meter DO meter ISE FAAS	Monthly	Tailings ponds, Settling ponds and all sources of waste water flowing out of the mine and mill site	PGPRC/FRC MMT		70% of effluent std	Effluent Std Class SC Water Quality Criteria Class SC	Check efficiency of tailings ponds and treatment	Repair or enhance efficiency of waste water or pollution control facilities
	• Air quality degradation	• TSP • SOx • NOx • Trace Metals • Periodic emission testing for: - SOx	GHVS* TAGS** TAGS** Quest Noise Dosimeter	Quarterly	Mill Compound	PGPRC/FRC MMT		70% of Ambient Air Quality	NAAQG Values	Spray dusty areas with water Have vehicles and equipment check for	Repair of emission sources

Key Environmental Aspects per Project Phase	Potential Impacts per Environmental Sector	Parameters to be Monitored	Sampling & Measurement plan			Lead Entity	Annual Estimated cost	EQPL Management Scheme			
			Method	Frequency	Location			EQPL[1] Range		Management Measure	
								Action	Limit	Action	Limit
	• Noise pollution	- NOx - TSP - Noise								emission levels	
II. Abandonment Phase											
Continuous run-off from tailings ponds and mill materials	Water pollution	• TSS • TDS • pH • Cyanide • DO • Heavy metals (As, Cd, Cu, Dis_Cu, CN_Free, Hg, Cr, Ni, SB, Zn, Pb and Fe)	Gravimetric pH meter DO meter ISE*** FAAS****	Monthly	Control and impact stations	PGPRC/FRC MMT		70% of effluent std	Effluent Std Class SC Water Quality Criteria Class SC	Check efficiency of tailings ponds and treatment	Repair or enhance efficiency of waste water or pollution control facilities

8.0 LIST OF STAKEHOLDERS

- Barangay Amoroy
- Barangay Bangon, Capsay, Panique
- Barangay Puro
- Barangay Lanang
- Barangay Balawing
- Syndicate
- Municipality of Aroroy
- Province of Masbate