

York Investment Inc. *94 Oronoque Street, Queenstown, Georgetown.*
Itaca Quarry Project Summary
2021

December 30, 2020

Mr. Newell Dennison
Commissioner
Guyana Geology and Mines Commission
Brickdam
Georgetown

Dear Mr. Dennison,

Application for Quarry License

I hereby apply for Quarry License for the area designated as **Itaca Quarry**.

This application is accomplished by this project document, which provides information on the geology of the area, the work program for the first year, exploration budget and other related details.

We are also requesting that all relevant concessions related to this location and the sector in general be available to us so as to maximize our possibilities through this investment.

Yours sincerely,

.....

Itaca Quarry Project

Summary 2020

Itaca, Coastal Zone



Contents

Summary..... 8

2.0 Introduction..... 9

3.0 Location, Physiography & Access..... 10

4.0 Property Description & Property Status 11

 4.1 Property Description 11

 4.1 Property Status 12

5.0 Previous Work of the Surrounding Areas..... 13

6.0 Geology & Petrography 13

 6.1 Regional Geology 13

 6.2 Local Geology..... 14

 6.3 Petrography 15

7.0 Geophysics & Structures..... 20

8.0 Quarrying 23

 8.1 Geotechnical 23

 8.2 Quarry Mineral Reserve Estimate and Production Schedule..... 23

 8.3 Manpower 24

 8.4 Production Schedule 24

9.0 Drilling and Blasting 25

 9.1 Drilling 25

 9.2 Blasting Methods 25

 9.3 Blast Layout Calculations 25

 9.4 Typical Dimensions for Production Blasts 26

 9.5 Yearly Blast Production Requirements..... 26

 9.6 Fragmentation 27

 9.7 Blast Safety Considerations 28

 9.8 Blasting Personnel Requirements 28

10.0 Regulatory Requirements..... 28

 10.1 General Regulations..... 28

 10.2 Magazine Licenses 28

 10.3 Storage 28

 10.4 Location of Magazine 29

 10.5 Construction of Magazine..... 30

York Investment Inc. 94 Oronoque Street, Queenstown, Georgetown.
Itaca Quarry Project Summary
2021

10.6 Operation of Magazine	30
10.7 Transport of Explosive.....	30
10.8 Delivery of Explosives to Itaca Quarry Project	31
11.0 Blast Area Safety	31
11.1 Blast Pattern Design.....	31
11.2 Blast Vibration	31
11. 3 Airblast.....	32
11.4 Flyrock	32
11.5 Loading	33
11.6 Detonator Safety	33
11.7 Electrical Detonator Safety	33
11.8 Non-electric Detonator Safety.....	33
12.0 Blasting Criteria.....	33
12.1 Blast Management Controls.....	34
12.2 Hours of Operation	34
12.3 General Controls	34
12.4 Blast Fume Protocol.....	36
13.0 Blast Monitoring.....	38
13.1 Blast Data.....	38
13.2 Blast Fume Monitoring	38
13.3 Standards Relevant to Blast Monitoring/ Management	39
13.4 Independent Review	39
14.0 Proposed Fuel Consumption.....	40
15.0 Proposed Equipment List	40
16.0 Proposed Staffing & Infrastructure	42
16.1 Staffing.....	43
16.2 Proposed Infrastructure	44
17.0 Capital and Cost Estimates	45
17.1 Capital Cost Estimates.....	45
17.2 Operating Cost Estimates.....	45
17.3 Financial analysis.....	46
17.0 Environmental issues	47
18.0 Reclamation with limited backfilling.....	53

19.0 Approach and haul road maintenance	54
20.0 Site clean up	54
Appendix: Closure & Rehabilitation.....	55
Appendix: Gant Chart of Activities & Conceptual Flow chart.....	57
Appendix: Mine Layout	59

List of Tables & Figures

Figure 1. Location & Access Map	10
Figure 2. Physiographic Map	11
Figure 3. Property Status Map	12
Figure 4. Showing regional geology of the Guiana shield (sandspringsresources.com)	14
Figure 5. Local Geology Map of Itaca.....	15
Figure 6. Example of Rock from Itaca.....	16
Figure 7. Mafic minerals and K-feldspars can be seen up close.....	17
Figure 8. Quite Visible Banding in the Gneiss, notice the pinkish color of the K-feldspar.	18
Figure 9. Looking more like amphibolitic metabasalts	19
Figure 10. Rock Composition shows it has an intermediate composition	20
Figure 11. Aeromagnetic map of the area.....	21
Figure 12. SRTM Map with regional lineaments.	22
Figure 13. Rose Diagram showing Directional Trend.....	22
Figure 14. Volumetric Calculations	24
Figure 15. Proximity Map of Mine Site with regards to blasting	29
Figure 16. Blasting Parameters	31
Figure 17. Vibration Analysis.....	32
Figure 18. Personnel Distribution for Proposed Quarry Project.....	44
Figure 19. Example of Limited Backfilling.....	53
Figure 20. Planned Activites for the Five years.....	57
Figure 21. Conceptual Flow chart of Proposed Quarry	58
Figure 22. Mine Plan Layout	59

Table 1. Showing the predicted distribution of agregates.....	24
Table 2. Drilling Equipment needed	25
Table 3. Description of Blasting Parameter	26
Table 4. Blasting Parameters Cost Yearly	27
Table 5. Particle size distribution.....	27
Table 6. Blasting Schedule	34
Table 7. Projected Fuel Consumption Annually.....	40
Table 8. Showing cost related to proposed fuel consumption	40
Table 9. List of Equipment	41

York Investment Inc. *94 Oronoque Street, Queenstown, Georgetown.*
Itaca Quarry Project Proposal 2020

Table 10. Staff list.....	43
Table 11. Total Cost for Infrastructure	44
Table 12. Initial Capital Cost	45
Table 13. Operating Cost	46
Table 14. Cash flow for Palmer’s Point.....	47

Summary

- York Investment Inc. is applying for the areas of 1418 acres for quarry potential referred to as Itaca.
- Harvesting of rock for aggregate was historically mined at this location and has been abandoned since.
- It has an estimate 1,498,087 tons of rock in the area
- York Investment Inc. is looking to invest more than \$3 million usd to get the project started.
- A total of \$9.42 million USD for capital Investment and Life of Mine.
- The Payback Period is approximately a year and the open pit operating cost is \$4.47 per ton and crushing cost is \$2.35 per ton.

2.0 Introduction

The York Investment Inc. is looking to get into the quarrying business due to the development of the road network approved by European union for the Lethem/Georgetown road. The company has the financial Capabilities to fund such a project and has enlisted the help of the technical expertise to determine the feasibility of this project.

The Company has applying for the area known as Itaca, which had been mine up to the late 1960's. The pre-feasibility study shows the area has approximately 1,498,087 tons. The cash flow shows that the project can be profitable once detailed drilling program is done to confirm the initial appraisal.

The Blasting Proximity puts every one out of the radius, so no harm will come to anyone. To produce a ton of material it is going to cost approximately 1350 Guyana dollars. Which makes the quarry very lucrative.

3.0 Location, Physiography & Access

The Property is located approximately 82 km SW from Georgetown and 20 km NE from Bartica (Figure 1). It can be accessed by boat and the trip time is approximately 2 hours from Parika dependent on engine capacity and river current.

It is about a half day worth of travelling and the easiest access route when compared to others. The Essequibo River area experience on average 6-34mm rainfall monthly and temperatures between 21 degree Celsius – 35 degree Celsius. The area is covered in tall evergreen flooded riparian forest that is very dense and the area is hilly with most hills belong to mature age Terrain (Figure 2).

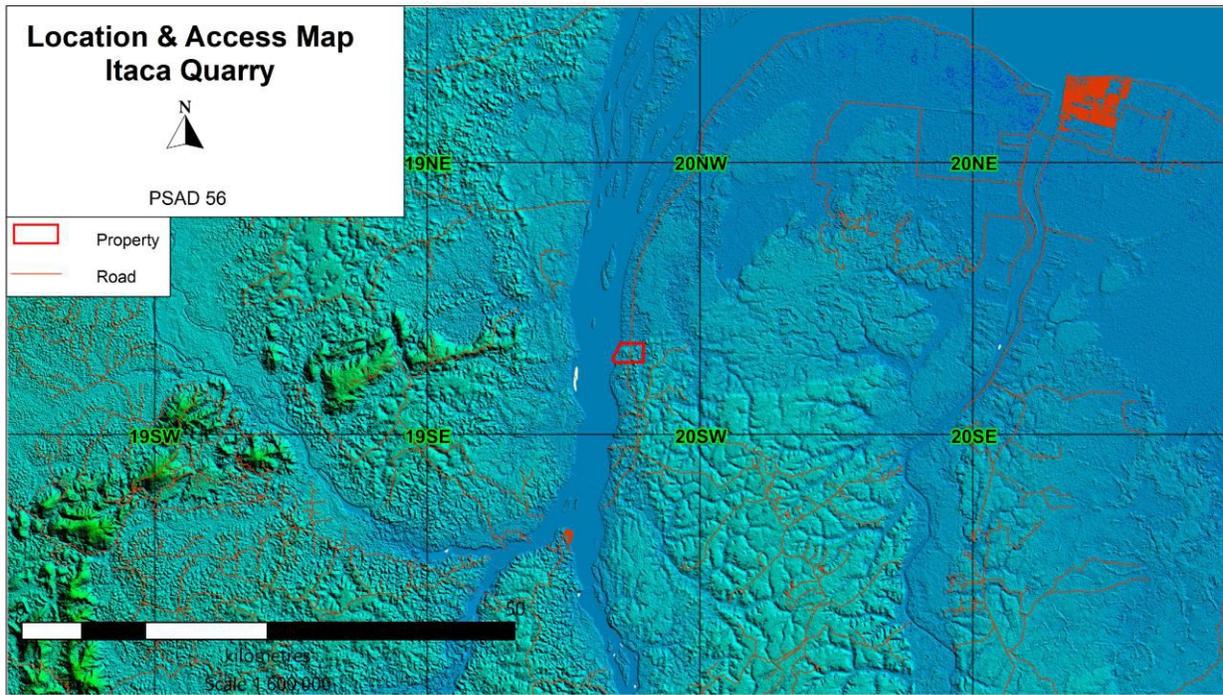


Figure 1. Location & Access Map

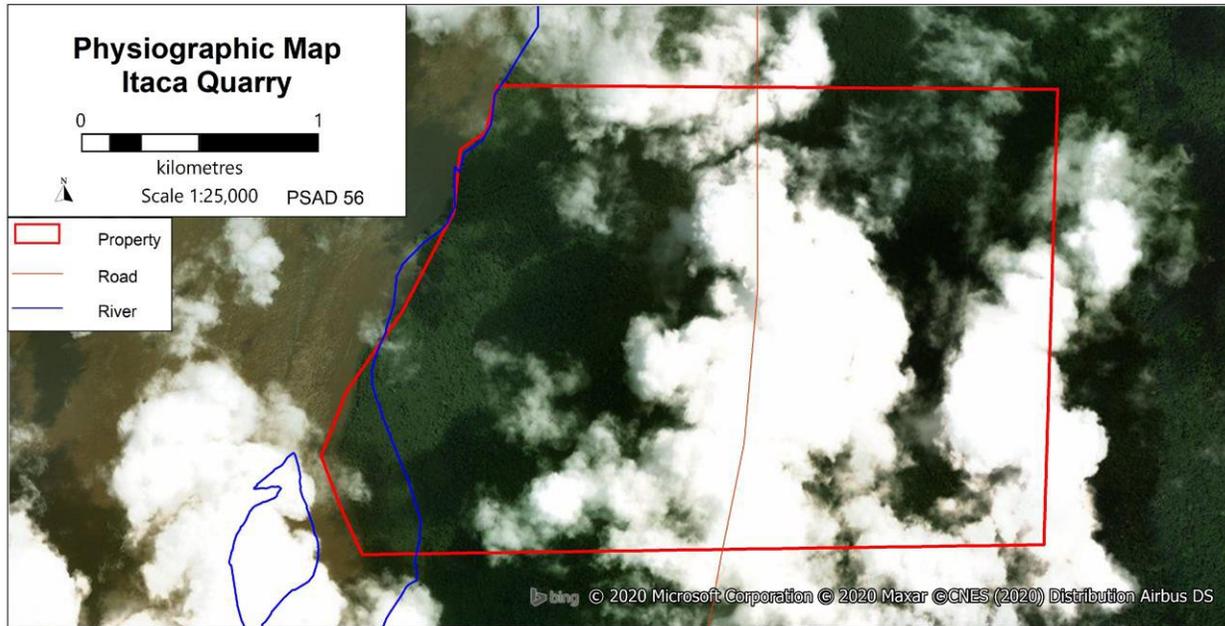


Figure 2. Physiographic Map

4.0 Property Description & Property Status

4.1 Property Description

Tract of state land located in the Coastal Area - No Mining as shown on Terra Surveys Topographic Map 19SE, at scale 1: 50,000 with reference point 'X' located at confluence of the Essequibo River and the Epikuru Creek with geographical co-ordinates of longitude $58^{\circ}36'58''\text{W}$ and latitude $6^{\circ}35'11''\text{N}$.

Thence at true bearing of 93° , for a distance of approximately 2 miles 1718 yards to point of commencement:

Point A, located at geographical coordinates of longitude $58^{\circ}34'17''\text{W}$ and latitude $6^{\circ}35'14''\text{N}$, thence at true bearing of 71° , for a distance of approximately 1 mile 1006 yards, to Point B, located at geographical coordinates of longitude $58^{\circ}32'59''\text{W}$ and latitude $6^{\circ}35'40''\text{N}$, thence at true bearing of 180° , for a distance of approximately 1 mile 988 yards, to Point C, located at geographical coordinates of longitude $58^{\circ}32'59''\text{W}$ and latitude $6^{\circ}34'19''\text{N}$, thence at true bearing of 270° , for a distance of approximately 1 mile 1670 yards, to Point D, located at geographical coordinates of longitude $58^{\circ}34'41''\text{W}$ and latitude $6^{\circ}34'19''\text{N}$, thence at true bearing of 12° , for a distance of approximately 621 yards, to Point E, located at geographical coordinates of longitude $58^{\circ}34'37''\text{W}$ and latitude $6^{\circ}34'37''\text{N}$, thence at true bearing of 46° , for a distance of approximately 372 yards, to Point F, located at geographical coordinates of longitude $58^{\circ}34'29''\text{W}$ and latitude $6^{\circ}34'45''\text{N}$, thence at true bearing of 6° , for a distance of approximately 290 yards, to Point G, located at geographical coordinates of longitude $58^{\circ}34'29''\text{W}$ and latitude

York Investment Inc. 94 Oronoque Street, Queenstown, Georgetown.
Itaca Quarry Project Proposal 2020

6°34'53"N, thence at true bearing of 55°, for a distance of approximately 143 yards, to Point H, located at geographical coordinates of longitude 58°34'25"W and latitude 6°34'55"N, thence at true bearing of 14°, for a distance of approximately 221 yards, to Point I, located at geographical coordinates of longitude 58°34'23"W and latitude 6°35'2"N, thence at true bearing of 27°, for a distance of approximately 457 yards, to the point of commencement at Point A.

Thus, enclosing an area of approximately 1418 acres, save and except all lands lawfully held or occupied.

4.1 Property Status

Currently, there are a few mineral licenses next to the proposed quarry (Figure 4). In terms of commercial property there is Correia Property on the waterfront.

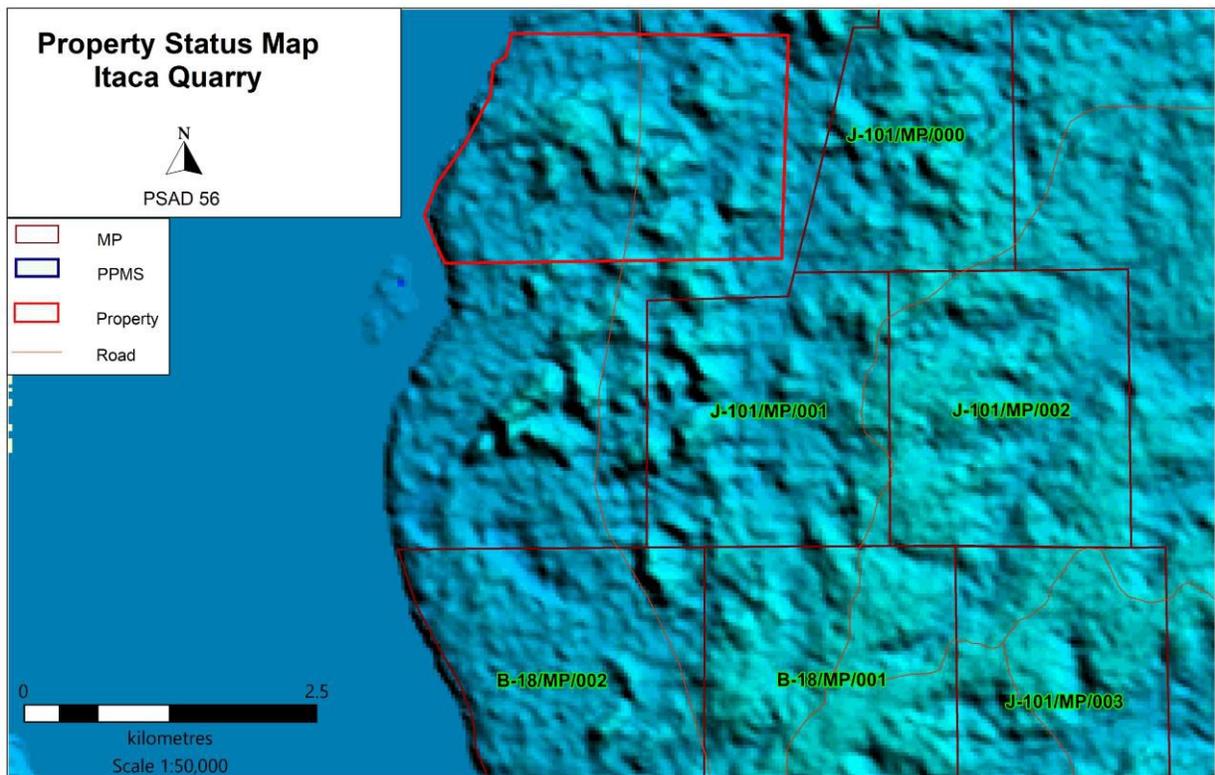


Figure 3. Property Status Map

5.0 Previous Work of the Surrounding Areas

Initial Investigation of the area was undertaken by C.B Brown and J.W Sawkins in 1875 were originality investigating rumors of gold along the Mazaruni River. J.B Harrison (1908), identified the granite in the area. “It was the largest development of true granite in the part of the Colony, I have visited is the mass at the Junction of Mazaruni, Cuyuni and Essequibo. Specific Gravity 2.59 to 2.63 grey colored medium to fine grained texture. Containing Biotite, Sphene muscovite and oligoclase.” Grantham (1935) did some river traverses in the area. Dixon (1948) describe the granites as non-porphyritic hornblende granite with sharp contact with the gneissose granite. The initial 6,000,000 tons of hard rock reserve that was estimated by Dr. Schielly of the Geological Survey of Guyana in 1968 has been dramatically depleted due to production by Edgeworth Construction. Production by Edgeworth Construction and Mazaruni Granite Products Ltd. totaled approximately 450,000 tons between 1995 and 2003 at the current location of BK Inc. Quarry at Teperu. Bk Quarries Inc. has produced a combined total of 2,715,517 tons of stone, loam and sand at the same location. Teperu Quarry is the only quarry in close proximity to Itaca Quarry Proposed Quarry.

6.0 Geology & Petrography

6.1 Regional Geology

The Guiana Shield extends from the Atlantic Ocean margin, in the north and northeast of the South American Platform, to the Amazonas sedimentary basin in the south and to the Andes Belt in the west (Figure 5).

It can be divided into:

- Archean granulitic and gneissic terranes;
- Paleo-Proterozoic granite-greenstone belts;
- Undifferentiated granitic and gneissic terranes;
- Meso-Proterozoic plutonic, volcanic and sedimentary units;
- Neo-Proterozoic mafic and alkaline intrusions;
- Phanerozoic sedimentary units;
- Cenozoic lateritic and Clastic units.

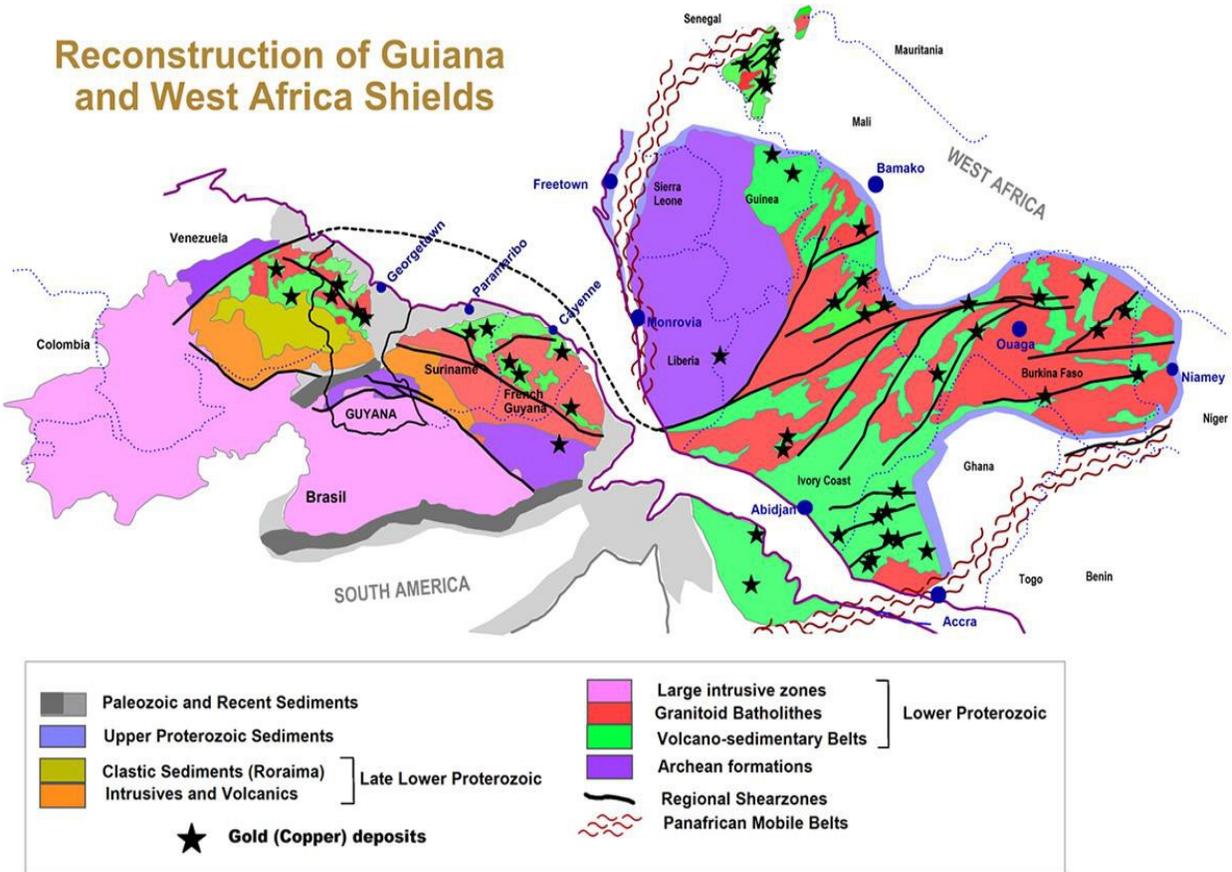


Figure 4. Showing regional geology of the Guiana shield (sandspringsresources.com)

6.2 Local Geology

The local geology of the area has two distinct lithologies; Bartica Gneiss Complex and BMS Metabasic rocks (Figure 5).

Bartica Gneiss Complex

Gneiss Metamorphic rocks.

In that area distinct gneisses are present, but occur in narrow zones within a belt of syntectonic granites with amphibolitic xenoliths and amphibolite slivers. It consists of various ortho and paragneisses and amphibolites, generally metamorphosed in the almandine amphibolite facies.

Barama Mazaruni Supergroup

Meta-basic rocks.

Meta-basalts, dolerites and meta-gabbros occur in several parts of the field area, usually in the areas with higher laterite capped hills. One large area dominantly composed of meta-gabbro (see below) is thought to be part of a slightly younger unit.

Work in other areas of Guyana (Gibbs & Barron 1993) suggests that such rocks form the lower part of the greenstones of the Barama-Mazaruni Supergroup, and minor interbedded siliceous meta-sediments (e.g. cherts and siltstones) and basaltic tuffs are also present. Such rocks are thought to grade upwards to more andesitic volcanics. One possibility is that this is part of an ophiolite suite. Locally meta-diorites have been recognised intruding into this unit.

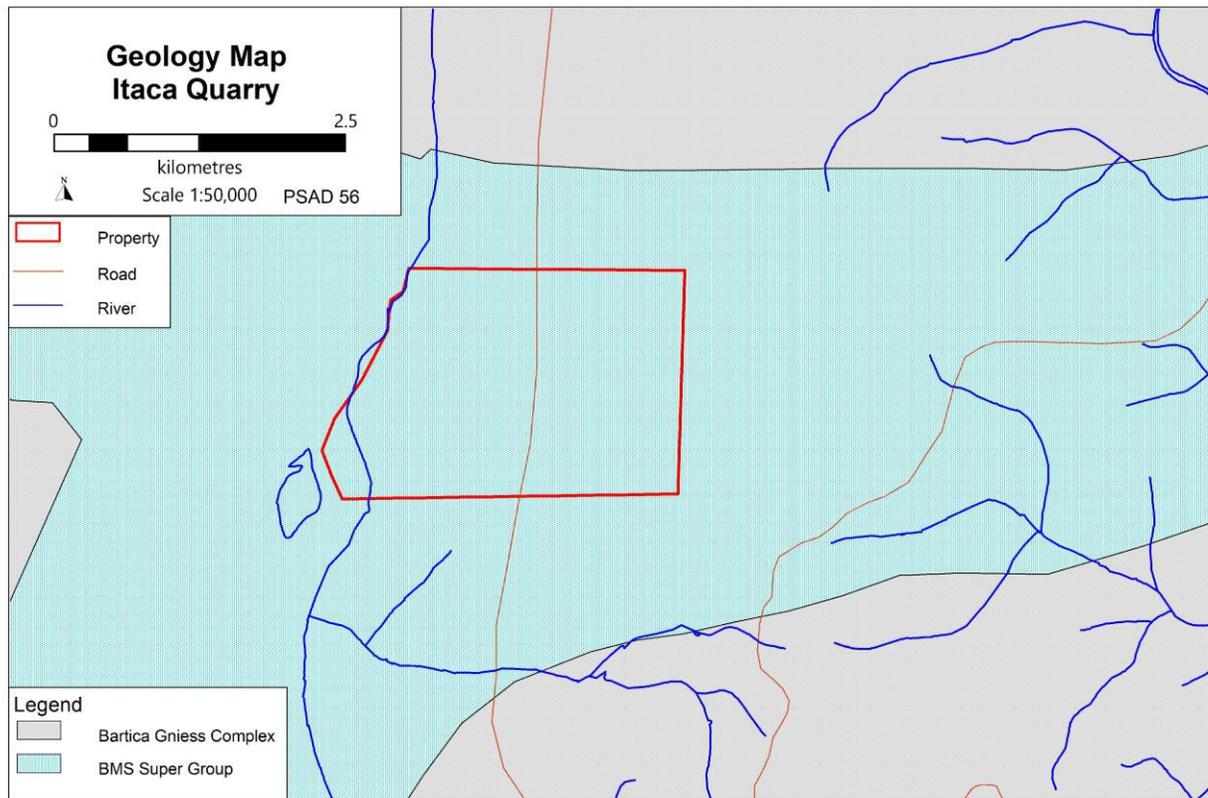


Figure 5. Local Geology Map of Itaca

6.3 Petrography

These gneisses show similar composition to the supamo gneiss in Venezuela (Figure 7). This succession is in many instances synclinally folded, with metamorphic grades decreasing from the amphibolitic metabasalts at the peripheries of the greenstone belts to greenschist or subgreenschist facies metavolcanic rocks and phyllites in the belt interiors. Granitoid gneiss complexes, including the Bartica gneisses, separate the greenstone belts. This greenstone--gneiss

terrane is exposed over about 65 000 km² of Guyana north of the Pakaraima Mountains and west of the Berbice coastal basin. A comparable area of greenstone-gneiss terrane is exposed in eastern Venezuela, where the metasedimentary rocks are known as the Pastora Supergroup, and some of the intervening rocks are known as the Supamo gneiss



Figure 6. Example of Rock from Itaca

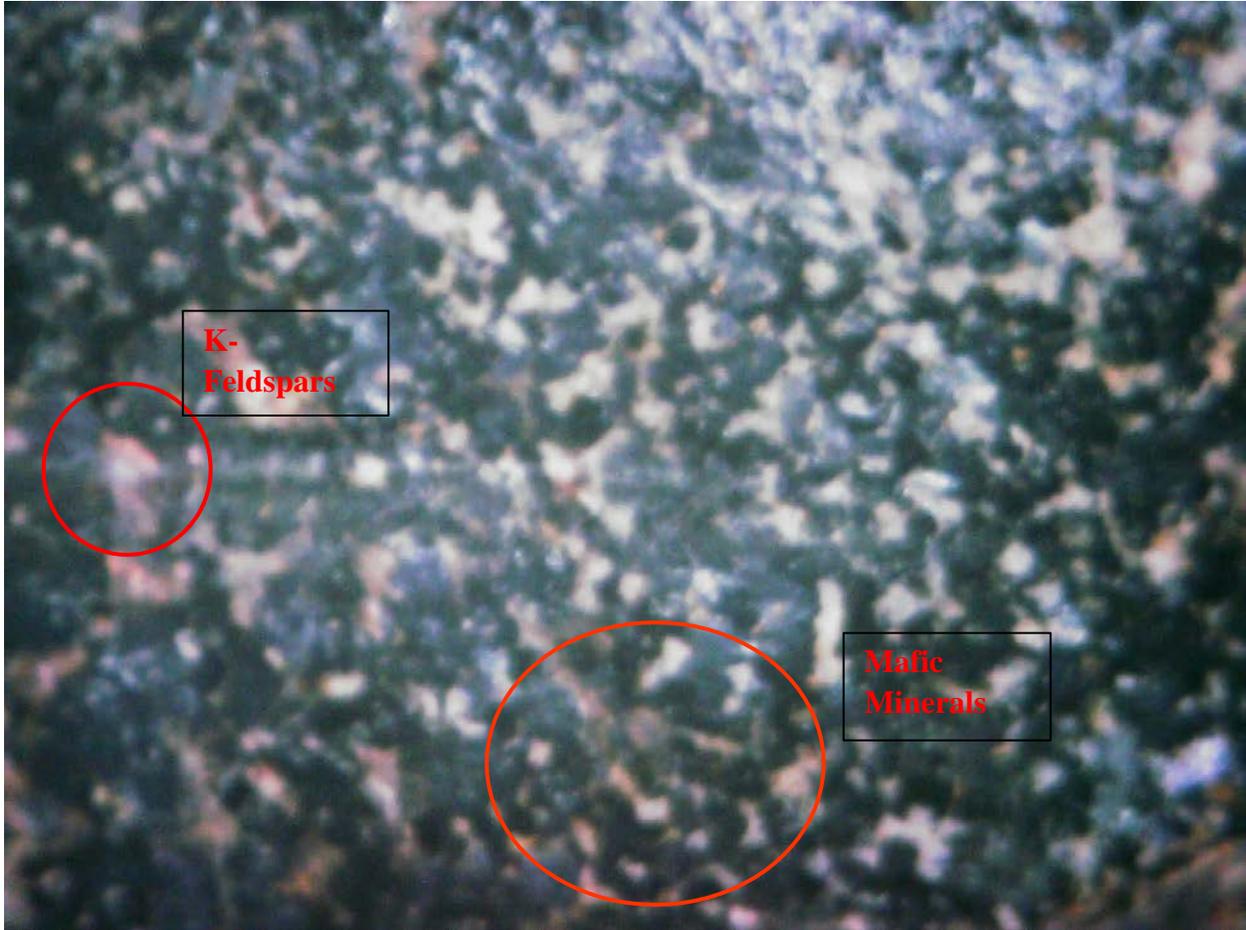


Figure 7. Mafic minerals and K-feldspars can be seen up close



Figure 8. Quite Visible Banding in the Gneiss, notice the pinkish color of the K-feldspar.

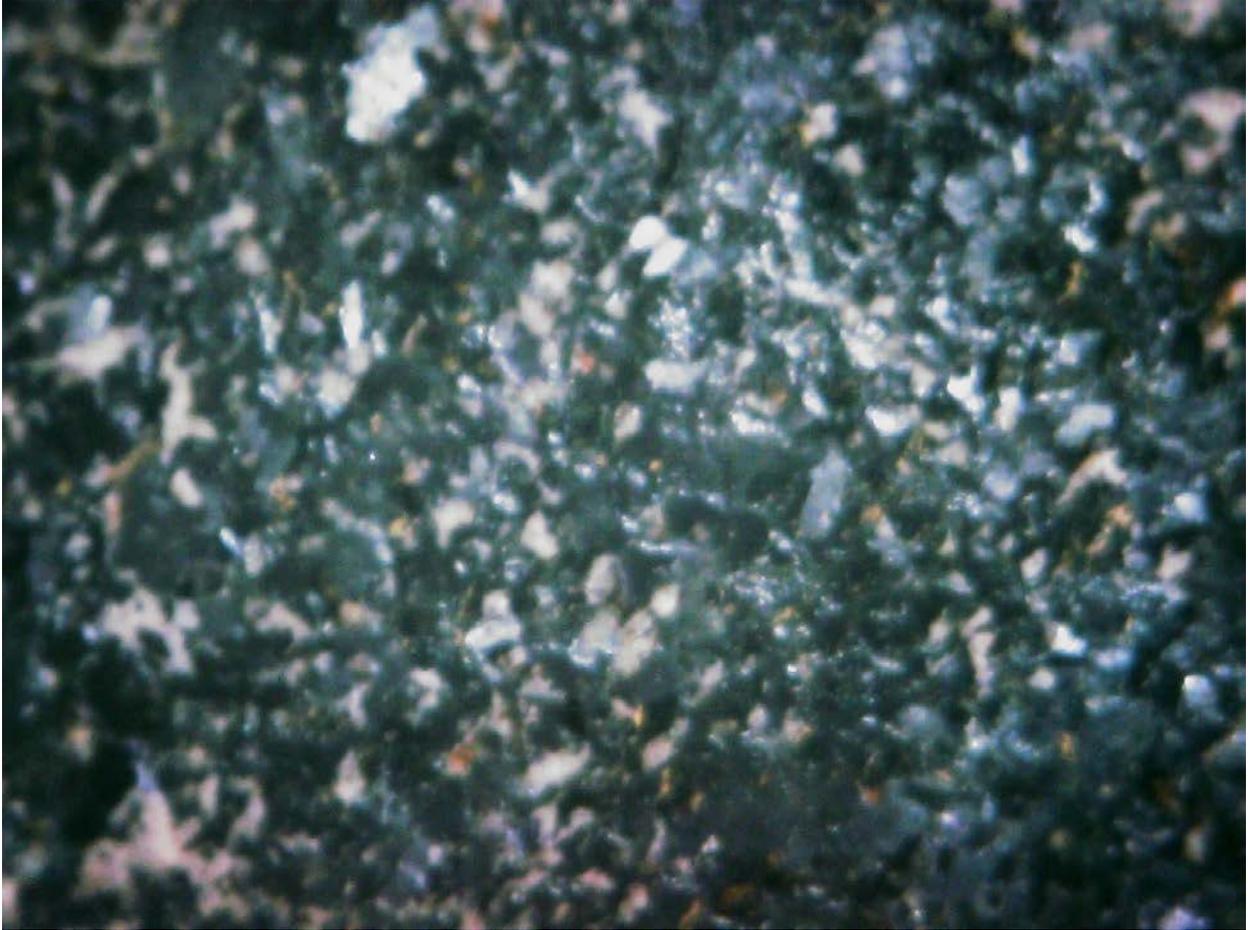


Figure 9. Looking more like amphibolitic metabasalts

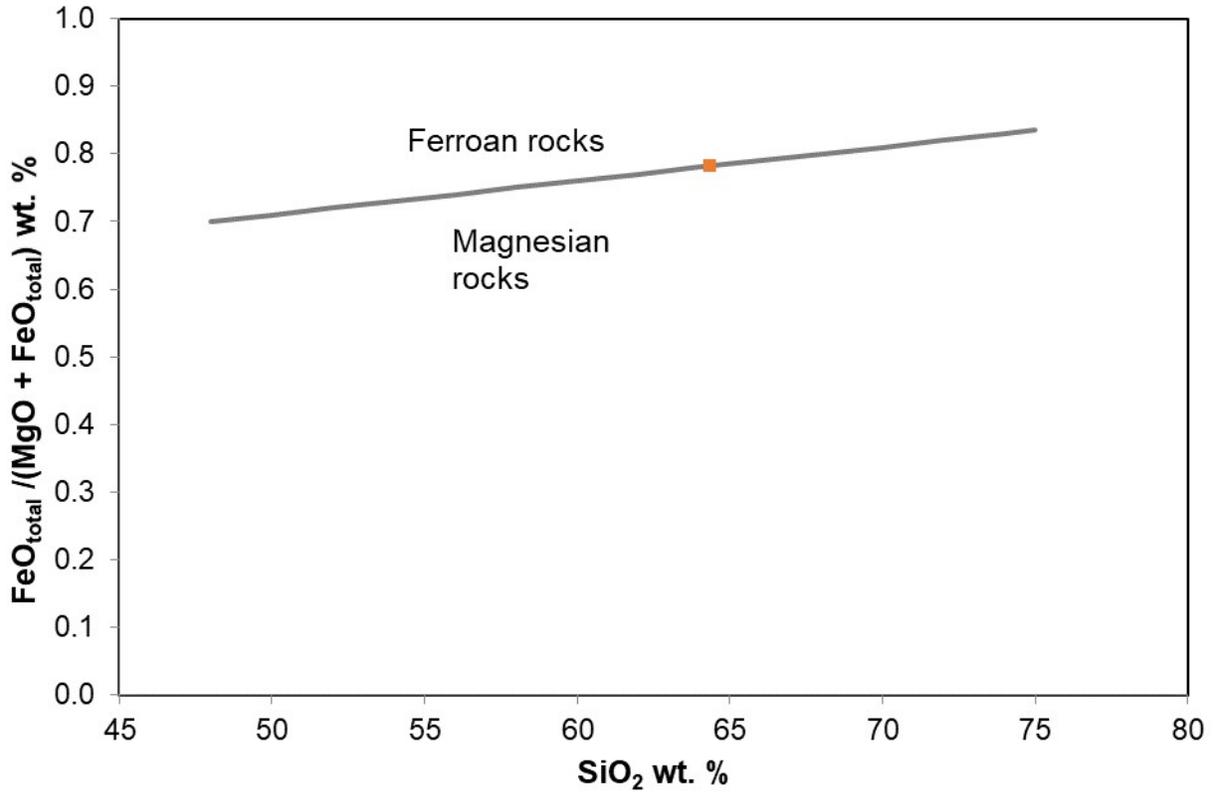


Figure 10. Rock Composition shows it has an intermediate composition

7.0 Geophysics & Structures

The Aeromagnetic maps reveal good values of NT, which correlates to Iron rich minerals and sediments. From the aeromagnetic, it shows good downwards continuity of the structure and its trending E-W (Figure 11).

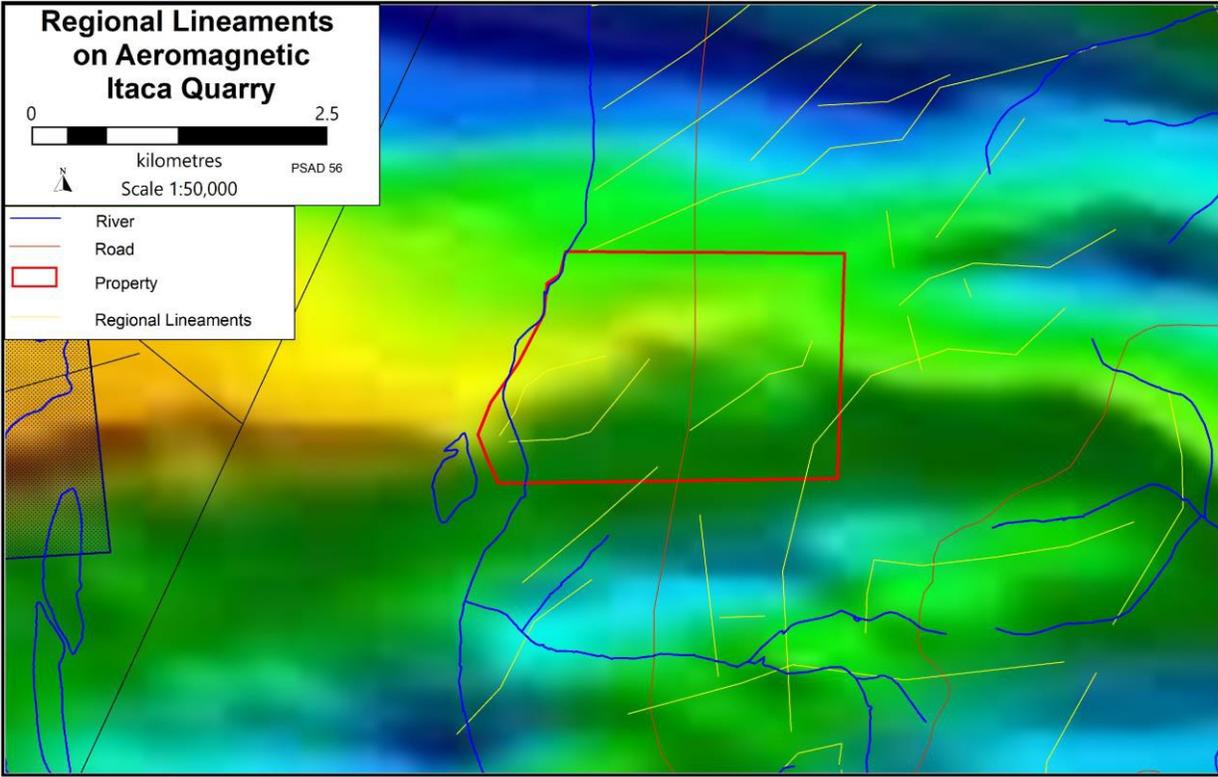


Figure 11. Aeromagnetic map of the area

The regional lineaments show a general ENE-WSW (Figure 12). Majority of the inferred lineaments correspond well with the topography. Based on observation from the site visit, the underlying structures are roughly 5-40m below the surface

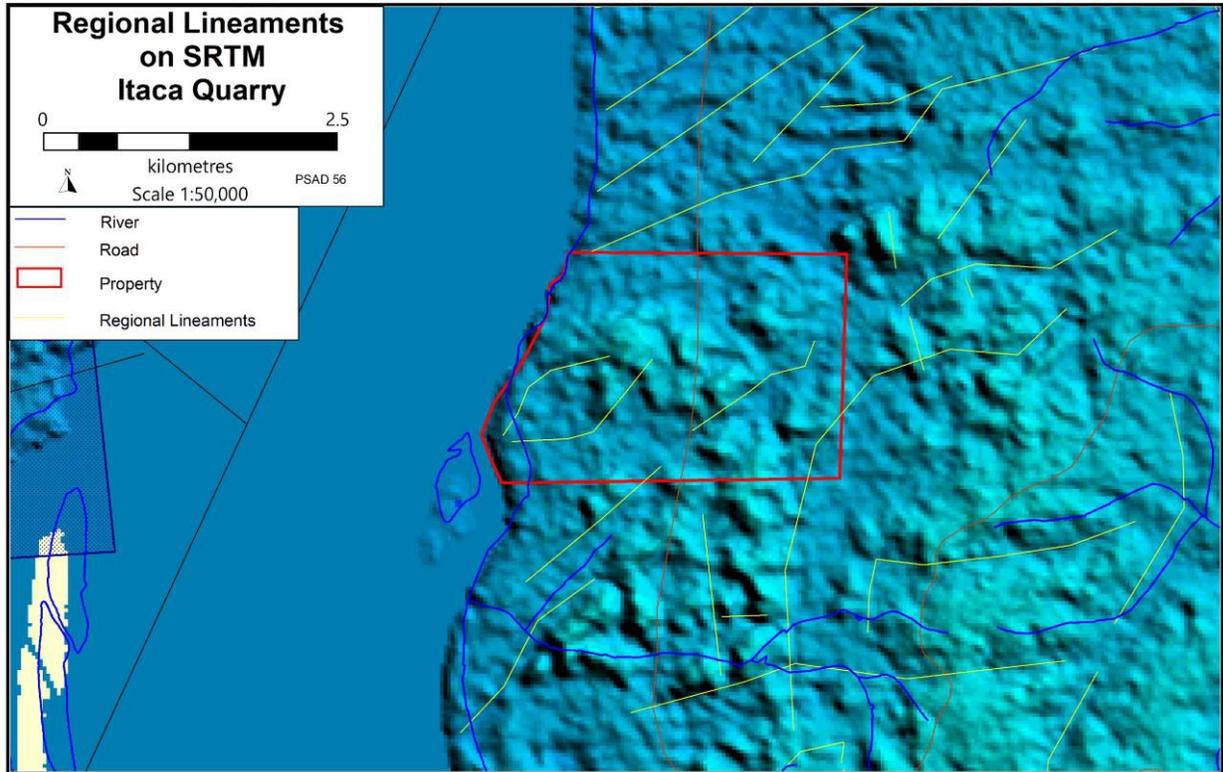


Figure 12. SRTM Map with regional lineaments.

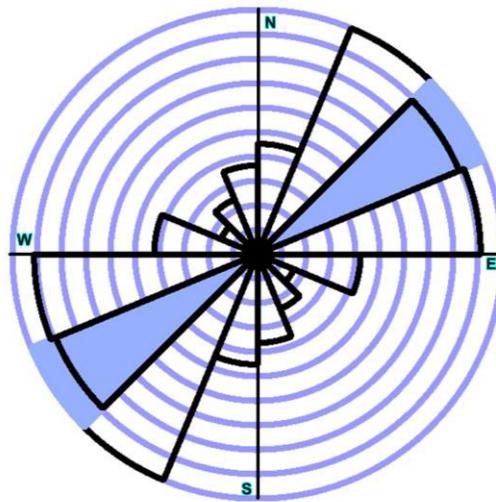


Figure 13. Rose Diagram showing Directional Trend.

8.0 Quarrying

8.1 Geotechnical

The Quarry will be developed within the hard rock zone. The Quarry design criteria will be based on the structural nature of the rock mass rather than the strength of material. With bench face angles varying from 70° to 75° , catch bench widths vary from 6m to 10m and final bench heights of 10m. The overburden soils are made of typically 5m to 40m lateritic material. A bench face angle of 65° is recommended, with bench heights of 10m.

8.2 Quarry Mineral Reserve Estimate and Production Schedule

York Investment Inc. Quarry has planned all its work activities for the next five years. It has plan to acquire two mobile crushers to increase productivity. The pits are located further back from the river front (Figure 20). 5 km of haulage road network will be constructed at the various stages of development mine plan. A waste material dump site is also staged for development in 2021 to stockpile gangue material. This quarry supplies boulders, gabions and crushed aggregates in the following fractions 7/8", 3/4", 5/8", 1/2", 1/4" minus, sifting and quarry cleaning. Based on the volumetric calculations the total tonnage of each pit was calculated. Based on the on the timeline of Pit production a total of quarriable material for each year was determine by percentage of time (months of production for that fiscal year) multiply by total tonnage of that pit. Using all this information a quarry resource estimate was made and therefore an estimate production of quarriable material from York Investment Inc. Quarry. A total of 1,498,087 tons of metabasic material is available for road construction, sea defenses, aggregates etc.

York Investment Inc. 94 Oronoque Street, Queenstown, Georgetown.
Itaca Quarry Project Proposal 2020

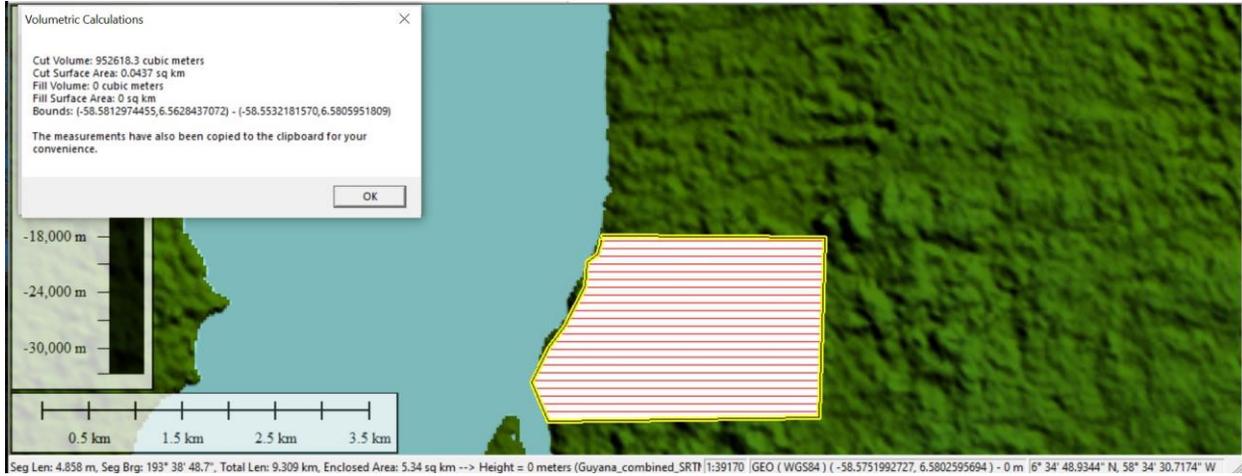


Figure 14. Volumetric Calculations

8.3 Manpower

The Quarry workforce will total 23 personnel. Technical personnel total to 3, Mine operations total 15 and mine maintenance total 5.

8.4 Production Schedule

The overall Quarry production mining schedule was developed in order to meet the demands of New infrastructure development. Two pits may be mined simultaneously, to meet the required fresh rock ore. The Quarry production schedule is summarized in Table below:

ITEM	PERCENTAGE	Year 1	Year 2	Year 3	Year 4	Year 5
1ST Grade Crusher Run	10%	25000	26250	27563	28941	30388
2nd Grade Crusher Run	2%	5000	5250	5513	5788	6078
7/8" Aggregate	2%	5000	5250	5513	5788	6078
3/4" Aggregate	40%	100000	105000	110250	115763	121551
5/8" Aggregate	2%	5000	5250	5513	5788	6078
1/2" Aggregate	15%	37500	39375	41344	43411	45581
Sifting	4%	10000	10500	11025	11576	12155
Underlayer	10%	25000	26250	27563	28941	30388
Boulder	10%	25000	26250	27563	28941	30388
Sand	5%	12500	13125	13781	14470	15194
Total	100%	250000	262500	275625	289406	303877

Table 1. Showing the predicted distribution of aggregates.

9.0 Drilling and Blasting

9.1 Drilling

The drilling and blasting plan cater for efficient rock excavation. A tried, tested and proven delay design will be implemented to achieve the best fragmentation, heave and muck pile profile. The blast patterns to be used will be multi-row staggered rectangular arrangements. To meet productions goals, 12 holes are needed to be drilled per day. Two drills are needed to meet this target. ECM590 will be used because of its relatively low cost and their ability to drill holes in a single pass, reducing drilling times. Penetration rates for blast hole drills were assumed to be 132 feet per hour and a set up time between holes of 4 minutes. The average depth of the holes is 34.4 feet. The drill time for each hole including set up time is 13 min per hole. With the 50-minute hour operating time it is estimated that each drill will complete an average of 40 holes per 12-hour shift. Table shows the drills that will be on site by year 2.

Group	Equipment	Manufacturer	Cost
<i>Drill</i>	Rand drill (ECM 590)	Ingersol	\$ 400,000

Table 2. Drilling Equipment needed

9.2 Blasting Methods

The design of a blast depends on its location, geological structures in that area, volume of rock in the target area, end product requirements and any limiting factors in relation to potentially sensitive locations (including residences and infrastructure).

9.3 Blast Layout Calculations

MAGNAFRAC 2.5" X 16' was selected based on weather conditions. The specific gravity of the explosive was assumed to be 1.2 g/cc. The rock mass at the Mine site was given at 2.621 ton/yd³ (Granite). A blasthole diameter of 3 inches was selected. It should be noted that it is within the range of hole sizes that the drill rig, an ECM590 is capable of drilling. The bench height was set at 32.2 feet to best accommodate the equipment fleet.

<i>Blast Dimensions</i>	
Burden	5.3 ft.
Spacing	8.7 ft.
Subdrill	1.6 ft.
Hole Depth	34.4 ft.
Stemming Length	4 ft.
Explosive Column length	32.2 ft.

Table 3. Description of Blasting Parameter

9.4 Typical Dimensions for Production Blasts

A blast with the aforementioned dimensions can be expected to liberate 55.5 Yd³ (111.13 tons) of material per blast hole.

9.5 Yearly Blast Production Requirements

The explosives column weight required per hole will be 78.4 lbs., which equates to a powder factor of 1.41 lbs./yd³. Each hole will be initiated with a combination of Excel Handi Dets and Electric detonators. The time delay between holes will be 10ms to ensure good fragmentation, and a time delay between rows will be 20ms. As a further precaution, no two holes will be allowed to detonate within 8ms of each other to reduce the impact vibration.

York Investment Inc. 94 Oronoque Street, Queenstown, Georgetown.
Itaca Quarry Project Proposal 2020

Year	Time	Total Fresh Ore & Rock to be Blasted (Tons)	Volume of Rock (m ³)	No. Of Blast Holes	Total Explosives (kg/Magnafrac)	Total Drilling & Blasting Cost
2021	Year 1	250,000.00	95,383.44	2,216	78,895	575,000
2022	Year 2	262,500.00	100,152.61	2,327	82,840	603,750
2023	Year 3	275,625.00	105,160.24	2,443	86,982	633,938
2024	Year 4	289,406.25	110,418.26	2,565	91,331	665,634
2025	Year 5	303,876.56	115,939.17	2,694	95,898	698,916
Totals		1,381,407.81	527,053.72	112,310	3,998,221	3,177,238

Table 4. Blasting Parameters Cost Yearly

9.6 Fragmentation

The Kuz-Ram Model was used to predict the expected fragmentation for production blasting within the Quarry mine. The figure shows the expected blast fragmentation for the mine site. It should be noted that this calculated fragmentation curve is similar enough to existing fragmentation curves as to give reasonable confidence in the design.

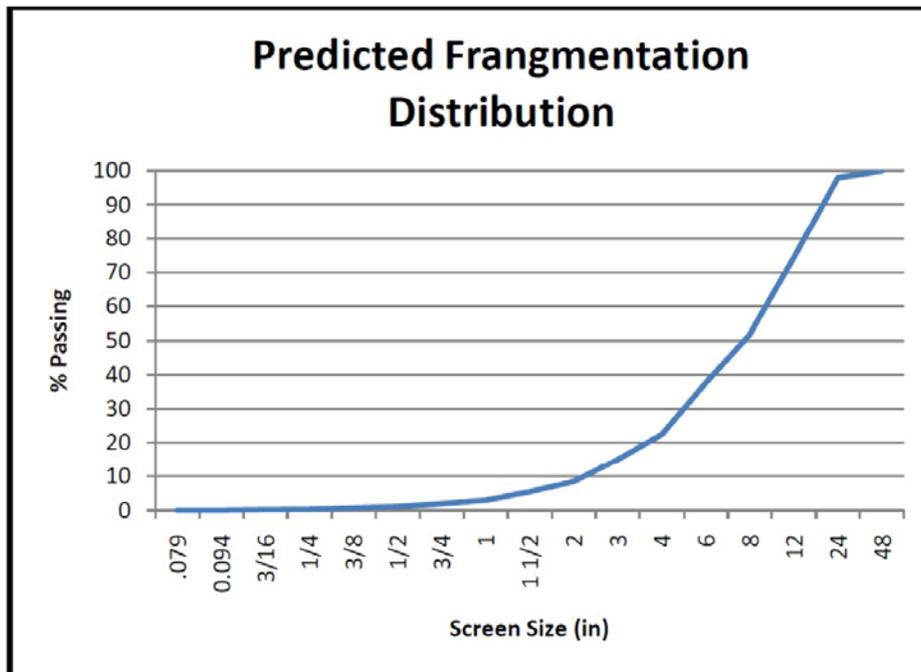


Table 5. Particle size distribution

9.7 Blast Safety Considerations

It was important to consider safety factors in the production blast design for the Itaca Quarry Project. Only trained members of the powder crew will be allowed on blast patterns that have been or are being loaded. Whenever possible, blasting should occur after the production shift has ended.

9.8 Blasting Personnel Requirements

It was assumed that the blasting crew will spend 6 minutes on each hole. This time takes into account placing of MAGNAFRAC, HANDI-DET/EXCEL HTD, all in one combination of electric detonators at 10ms and 20ms delay connectors with Cordtex of suitable lengths, placement of stemming, maneuver time between holes and the time taken to tie in the pattern. All the blasters will place the explosives, detonators and DET cords into the holes and one will place stemming into the holes using a skid steer loader. Once all the holes are loaded all three blasters will tie in the pattern and retreat to a safe distance for detonation.

10.0 Regulatory Requirements

10.1 General Regulations

The maintenance and operation of explosives magazines and use of explosives are subjected to The Explosives Act: Chapter 16:06 and The Blasting Operations Act Chapter 65:03 of the Laws of Guyana. Construction, storage and management of the explosive magazine, and use of explosives will be in accordance with the relevant sections of 'The explosives Act: Cap.16:06 and 'The Blasting Operations Act: Cap. 65:03.'

10.2 Magazine Licenses

When a magazine is constructed onsite, general rules for a magazine construction and upkeep under Section 6 of The Explosives Act Cap. 16:06 will be observed and implemented.

10.3 Storage

Explosives will be stored in an approved, licensed and properly constructed magazine under suitable conditions to:

- Comply with statutory regulations;
- Minimize the risk of accidental spills and explosions;

York Investment Inc. 94 Oronoque Street, Queenstown, Georgetown.
Itaca Quarry Project Proposal 2020

- Minimize deterioration that may adversely affect safety or performance;
- Provide separation of incompatible explosives;
- Prevent unauthorized access and theft;
- Provide safety distances from ‘protective works’;
- Maximize shelf life; and
- Enable ready access to products when required.

10.4 Location of Magazine

The explosives magazine will be located approximately 1000 feet from the plant and dwellings structures. The site will be cleared so that there is no danger from bush fires and the local fire authority at Bartica will be informed of the location of the magazine. The detonator magazine will be located at the legally prescribed distance (approx. 100 ft.) from the explosive’s magazine in accordance with The Explosives Act Cap. 16:06.

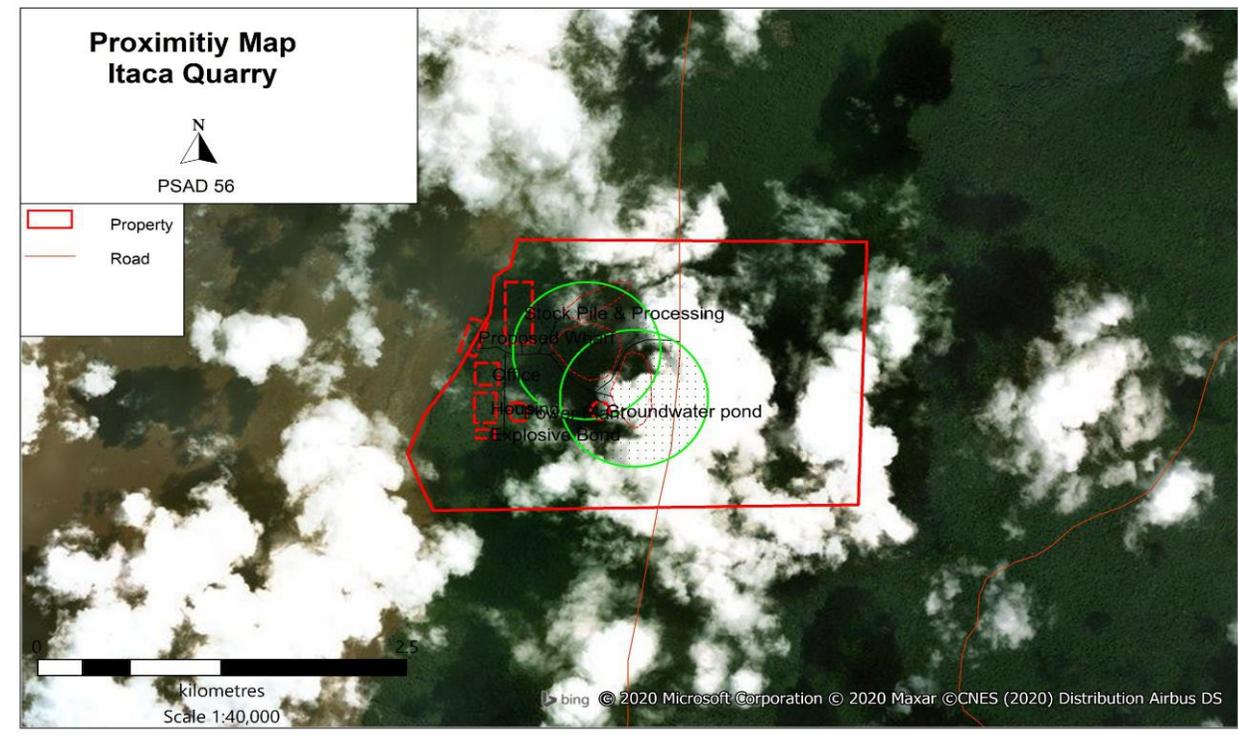


Figure 15. Proximity Map of Mine Site with regards to blasting

10.5 Construction of Magazine

The magazine will be constructed in accordance with Section 6 of The Explosives Act Cap.

16:06 and will be weather, fire and projectile resistant. The magazine will be constructed of metal or concrete and provided with lightning protection. The doors to the magazine will be provided with tamper proof locking to prevent theft. Warning signs, “Explosive,” will be placed on magazines and a “No Smoking,” sign placed on the door. All brass nails and screws will be countersunk to prevent them from coming into contact with the stored material.

The magazine will be constructed to prevent water from entering and causing stored explosives to deteriorate. The outside walls and roof of the magazine will be painted with a reflective color (silver frost on metal surfaces or with or light grey on masonry surfaces).

Ventilation will be provided to allow air to circulate freely through the magazine, thus reducing high temperature and humidity. All external vents will be screened to prevent the entrance of sparks and airborne debris from bush fires.

10.6 Operation of Magazine

The explosives magazine will be operated in accordance with Section 6 of The Explosives Act Cap. 16:06. An Officer designated by the minister in accordance with Section 5 of The Explosives Act Cap. 16:06 will be in charge of The Magazine. Four (4) members of the Guyana Police Force would be charged to secure the magazine at the mine site.

10.7 Transport of Explosive

Explosives will be transported in accordance with The Explosives Act Cap. 16:06. A license or permit will be applied for under Section 24 or 25 and acquired under Section 24 or 26 of The Explosives Act Cap. 16:06. Explosives will be transported in accordance with Section 26-28 of The Explosives Act Cap. 16:06. Explosives of different compatibility groups will be transported in separate compartments sufficiently separated to prevent fire from spreading.

A competent person must be appointed and have responsibility to ensure that explosive products are transported safely. Explosives would be transported under the supervision and security from The Guyana Police Force. A suitable vehicle is proposed to facilitate transport.

10.8 Delivery of Explosives to Itaca Quarry Project

Explosives will be stored at the National Magazine, Makouria in accordance with Section 8 of The Explosives Act Cap. 16:06. They will then be transported under GPF escort on the Essequibo River to Itaca Quarry Project.

11.0 Blast Area Safety

Suitable barricades, cautionary signs and sirens will serve as direct communication to prevent personnel from entering a blast area at firing time.

11.1 Blast Pattern Design

A Mining Engineer will design each blast. A blaster with a certificate of competency granted under Section 4 of The Blasting Operations Act Cap. 65:03, by the Commissioner, Guyana Geology and Mines Commission is proposed to perform blasting at the Mine Site. Geology- Gniess density 2.621.

Based on information from previous mining and testing, a one pattern blast design was completed for the hard rock ore horizon, as shown in the table below:

Material	Bench Height (ft.)	Hole Diameter (in.)	Burden (ft.)	Spacing (ft.)	Subdrill (ft.)	Stemming (ft.)	Explosive Density	Powder factor (lbs./yd ³)
Ore/Overburden	32.8	3	5.3	8.7	1.6	4	1.2	1.41

Figure 16. Blasting Parameters

11.2 Blast Vibration

It was assumed that the closest any blast will be to the plant structures and dwellings is 500 feet. Based on the particle velocity calculations, the current blast design is sufficient to prevent damages to infrastructure, as shown in table below.

<i>Vibration Analysis</i>	
<i>Damage</i>	<i>USBM Value (in/sec)</i>
Lowest Cracking Value	0.51
Crack extension in plaster	0.72
Crack extension in wallboard	0.79
Crack in CMU	6.37
Itaca Quarry Project, 500 feet from structures	0.1133

Figure 17. Vibration Analysis

11.3 Airblast

In the case of the Itaca Quarry Project, using 250m as the distance from sensitive sites, in order to comply with the 115dBL limit for 9 out of 10 consecutive blasts, this would require a maximum charge weight per 200ms delay of approximately 314lbs, or 4 holes. This would be very challenging to achieve using standard non electric delays. Airblast is directional however, so it is possible to greatly reduce the levels detected at monitoring points by altering the firing direction.

11.4 Flyrock

Stemming should be loaded at a rate that ensures no bridging of the material occurs inside the blasthole to reduce flyrock. The blast management plan outlines the precautions to reduce flyrock, Maximum distance Is 540 m. Where possible blasts should be fired to a free face with timing used to promote movement. Centre lift timing should be minimized. Blast designs should be created by an experienced and qualified blast designer and based on accurate survey pick up.

11.5 Loading

The blasting crew, led by the Blaster-in-Charge, will have the necessary tools and equipment to safely and efficiently load the explosives according to the plan.

11.6 Detonator Safety

The Blaster-in-Charge must be knowledgeable of all safety precautions regarding the detonator and the associated initiating system components before loading begins. All initiation systems must be used in accordance with the methods prescribed by the manufacturer.

11.7 Electrical Detonator Safety

Electric detonators must be checked with a proper test instrument before primer makeup. To ensure that the detonators have not been damaged during loading, they should be rechecked before stemming.

11.8 Non-electric Detonator Safety

Nonelectric initiation systems must be used in accordance with methods prescribed by the manufacturer.

12.0 Blasting Criteria

The Itaca Quarry Project shall ensure that blasting on site does not exceed the criteria at any residence on privately-owned land.

The air blast overpressure level from blasting operations must not exceed:

- 115 decibel (dB) (Lin Peak) for more than five per cent of the total number of blasts over each reporting period
- 120 dB (Lin Peak) at any time.

The ground vibration peak particle velocity from blasting operations must not exceed:

- 0.197 inch per second (in./s) for more than five per cent of the total number of blasts over each reporting period
- 0.394 in./s at any time
- at any point within one metre of any affected residential boundary or other noise sensitive area in the vicinity of the plant.

12.1 Blast Management Controls

York Investment Inc. must implement reasonable and feasible best practice blast impact mitigation measures at the Itaca Quarry Project.

12.2 Hours of Operation

Impacts to public amenity for sensitive receivers in the vicinity of the Itaca Quarry Project have been managed through the design of the operation, including the restrictions on the hours of operation for the facility. The operating hours for the Itaca Quarry Project are described in Table 6 below. The Itaca Quarry Project will operate in accordance with the operating hours defined in

Table 6.

Activity	Operation Hours
Extraction Operations	6 am to 6 pm Monday to Saturday
Loading and Dispatch	6 am to 6 pm Monday to Saturday
Construction and Maintenance activities	6 am to 6 pm Monday to Saturday
Blasting	9 am to 5 pm Monday to Saturday

Table 6. Blasting Schedule

Note: The Applicant may carry out maintenance activities after hours.

12.3 General Controls

Control measures that have been considered as a standard part of the operation of the Itaca Quarry Project and incorporated include:

- All relevant quarry personnel will be trained on the environmental obligations in relation to blasting controls.
- The surrounding landowners/miners will be notified prior to undertaking a blast.
- The date, location of blast holes and quantity of explosive used each day will be documented.
- Blasts will be designed to comply with overpressure and vibration criteria.

York Investment Inc. *94 Oronoque Street, Queenstown, Georgetown.*
Itaca Quarry Project Proposal 2020

- Monitoring will be undertaken at the nearest residence and/or other sensitive locations (as required) to verify compliance with the relevant criteria.
- The maximum number of holes to be detonated in a blast is 150.
- Sufficient distance will be maintained between the blast hole and the mine face.
- Appropriate delays will be used.
- All blasts will be monitored and recorded.
- Blast monitoring data will be used on an ongoing basis to further refine the blast design and management.
- Blast design and blast management procedures will be periodically reviewed to evaluate performance and identify corrective action, if required.
- Blasting will be undertaken between 9.00 am and 5.00 pm, Monday to Saturday inclusive, except under apparent temperature inversions conditions when blasting shall only occur between 11.00 am and 1.00 pm Monday to Saturday. No blasting is undertaken on Sundays or public holidays, without approval of the Guyana Police Force (GPF).
- York Investment Inc. will undertake consultation with miners whose properties are adjacent to the development, with a view to determining the most appropriate blasting times for the development. The applicant shall, in accordance with the requirements of the GPF, give notice of proposed blasting times.
- Not blast more than twice a week unless an additional blast is required following a blast misfire.
- Design all blasts to minimize airblast overpressure and vibration using the NONEL system of equivalent.
- Design all blasts based on the results of monitored blasts and modelled predictions in table 6. This will minimize airblast overpressure and vibration such that any one blast has less than a five per cent probability of exceeding airblast overpressure and vibration goals as set by the Environment Protection Authority (EPA) for affected property.
- EPL noise limits of 115 dB/120 dB are likely to be exceeded.
- Undertake detailed designs for each blast in order to maximize the blast efficiency, minimize dust, fumes, ground vibration and airblast, the potential for flyrock and to ensure compliance with site specific blasting conditions.

York Investment Inc. *94 Oronoque Street, Queenstown, Georgetown.*
Itaca Quarry Project Proposal 2020

- York Investment Inc. undertake a pre-blast meteorological assessment in order to confirm the applicability of blasting during the proposed blasting times. The pre-blast meteorological assessment will inform the likelihood of potential blast impacts as a result of forecasted adverse wind inversion weather conditions.
- Monitor blasts as quarrying progresses utilizing the adaptive management techniques, so that blast prediction site laws can be further refined and future blast designs can be optimized based on more detailed site information. By adopting this approach, in conjunction with the adoption of improved blasting products and methods, as they are introduced, it is anticipated that blast emissions criteria can be met without imposing any significant constraints on blast designs throughout the operation of the Itaca Quarry Project. York Investment Inc. will design all blasts to comply with the project specific vibration and airblast criteria and to protect public and private infrastructure and property from any damage as a result of flyrock. Future updates of this plan will include any additional management requirements, taking into account the results of blast monitoring undertaken.
- The blasting site design will be regularly reviewed using site-specific blast monitoring data. This process will provide York Investment Inc. with flexibility to design blasts to best meet production requirements while complying with relevant criteria for residential receivers.
- All blast configurations and delays used will be thoroughly checked by the Mine Manager before the blasts are detonated.

12.4 Blast Fume Protocol

Blast fume development and migration will be observed and managed. With regard to Blast Fume Management, the following management controls include:

- use of appropriately qualified personnel. This includes an assessment of whether the contractor is appropriately trained to undertake the drill and blast works
- use of appropriate blast design as approved by the site drill and blast coordinator or his or her delegate appropriate dewatering of drill hole prior to loading

- minimization of ‘sleep time’ between loading and blasting, where practical
- prior to blasting, a visual weather assessment of meteorological conditions will be undertaken by the mine Manager to confirm that weather conditions are not conducive to fume migration
- in the event that blast fume generated by the blast, an investigation into the causes of the blast fume will be undertaken.

13.0 Blast Monitoring

York Investment Inc. will monitor blasts as mining progresses in accordance with the existing blast monitoring system so that blast performance and design can be further refined and future blast designs can be optimized based on more detailed site information.

Blast monitoring for airblast and vibration will continue to be undertaken at strategically identified locations to ensure compliance with the Guyana EPA Environmental Permit and the GPF Permit to transport, store and use explosives.

13.1 Blast Data

Data collected for each blast will include:

- measured vibration
- measured overpressure
- maximum instantaneous charge
- number of holes
- blast type
- meteorological conditions.

13.2 Blast Fume Monitoring

Fume monitoring and post-blasting investigation into fume events will be undertaken at the Itaca Quarry Project. Fume monitoring requirements include:

- visual assessment and analysis of each blasting event to determine whether excessive fume was generated as a result of the blast.
- All blasts undertaken at the Itaca Quarry Project will be video recorded to provide a record of the blast.
- In the event that any blast at the Itaca Quarry Project leads to the development of excessive fume an analysis of the blast will be undertaken to determine the cause of the blast fume development and whether the blast fume travelled off site analysis of

York Investment Inc. *94 Oronoque Street, Queenstown, Georgetown.*
Itaca Quarry Project Proposal 2020
meteorological conditions to determine the likely, if any, offsite impact of NO_x fume events post-blasting.

13.3 Standards Relevant to Blast Monitoring/ Management

York Investment Inc. will undertake blast monitoring at the Itaca Quarry Project in accordance with the policies, principles, regulations and guidelines contained within:

- The Environmental Permit, Guyana EPA
- Guyana Geology and Mines Commission Guidelines; and
- The Permit to transport, store and use explosives.

13.4 Independent Review

In the event that a neighboring landowner, the EPA, GGMC and GPF considers that the Itaca Quarry Project is exceeding blast Criteria at the mine or neighboring property, they may request an independent review of the blast impacts at the project or property.

14.0 Proposed Fuel Consumption

Item	Gallon Consumption per annum	Price per Gallon
Diesel	150,000	555
Gasoline	1,000	592
Lubricant oil	3,000	2590
Hydraulic oil	3,000	4,995
Grease	1000	2201.5

Table 7. Projected Fuel Consumption Annually

		2021	2022	2023	2024	2025
Capacity Utilization	100%	50%	60%	70%	80%	90%
Diesel	83,250,000	41,625,000	49,950,000	58,275,000	66,600,000	74,925,000
Gasoline	592,000	296,000	355,200	414,400	473,600	532,800
Lubricant oil	7,770,000	3,885,000	4,662,000	5,439,000	6,216,000	6,993,000
Hydraulic oil	14,985,000	7,492,500	8,991,000	10,489,500	11,988,000	13,486,500
Grease	2,201,500	1,100,750	1,320,900	1,541,050	1,761,200	1,981,350
Total	\$ 108,798,500.00	\$ 54,399,250.00	\$ 65,279,100.00	\$ 76,158,950.00	\$ 87,038,800.00	\$ 97,918,650.00

Table 8. Showing cost related to proposed fuel consumption

15.0 Proposed Equipment List

York Investment Inc. will procure all the equipment necessary for the Quarry Project Operation. All the equipment is necessary to ensure smooth operations and produce at least 1400 ton of ore daily. The proposed fleet of equipment comprises of the following:

York Investment Inc. 94 Oronoque Street, Queenstown, Georgetown.
Itaca Quarry Project Summary
2021

EQUIPMENT LIST	QUANTIT Y	Unit Cost (GYD)	TOTAL COST
Trucks (CAT 720)	1	\$ 45,000,000.00	\$ 45,000,000.00
245 & 236 Hydraulic Excavators (Caterpillar)	1	\$ 38,000,000.00	\$ 38,000,000.00
980B & 980C Wheel Loader (Caterpillar)	1	\$ 20,000,000.00	\$ 20,000,000.00
Bulldozer (Caterpillar - D8)	1	\$ 1,500,000.00	\$ 1,500,000.00
Mobile Crusher (100t/hr Nordberg)	1	\$ 100,000,000.00	\$ 100,000,000.00
Ingersol Rand Drill (ECM)	1	\$ 80,000,000.00	\$ 80,000,000.00
Generator (650KVA.) Caterpillar	2	\$ 5,000,000.00	\$ 10,000,000.00
Cat Water Tanker	1	\$ 8,000,000.00	\$ 8,000,000.00
Service Truck	1	\$ 5,000,000.00	\$ 5,000,000.00
Compressor	1	\$ 2,000,000.00	\$ 2,000,000.00
Fork Lift	1	\$ 2,000,000.00	\$ 2,000,000.00
Tower Light	2	\$ 500,000.00	\$ 1,000,000.00
Welding Plant	2	\$ 2,500,000.00	\$ 5,000,000.00
Cat Scraper	1	\$ 6,000,000.00	\$ 6,000,000.00
Rubber Wheel Roller	1	\$ 15,000,000.00	\$ 15,000,000.00
Steel Wheel Roller	1	\$ 20,000,000.00	\$ 20,000,000.00
Skidder	1	\$ 4,000,000.00	\$ 4,000,000.00
Tug Boats	1	\$ 25,000,000.00	\$ 25,000,000.00
1000 ton Barges	1	\$ 50,000,000.00	\$ 50,000,000.00
Pick-up	1	\$ 20,000,000.00	\$ 20,000,000.00
		Total	\$ 457,500,000.00

Table 9. List of Equipment

16.0 Proposed Staffing & Infrastructure

The company intends that the Quarry Project will be a model complex with facilities that are comparable with other regional and international. The topography is ideal with housing etc. overlooking the operation. The mine will have a full-time sanitation crew and a medic will always be on site with adequate medical supplies. Because of the threat of malaria in the area, the company will work closely with the Ministry of Health to maintain a malaria free environment at the quarry and nearby communities. A small water treatment plant for potable water supply will be constructed near at a suitable area within the quarry and water will be supplied from the treatment plant to the various sectors of the quarry. The company will employ hire 55 personnel, broken down as follows:

16.1 Staffing

NO	STAFF	NO OF EMPLOYEES
1	Quarry Master/Manager	1
	Engineers	
2	Mining	3
3	Mechanical/ Mechanic	3
	Supervisors and others	
4	Compressor operator	2
5	Excavator Operator	6
6	Drill operator	2
7	Heavy duty operator	3
8	Heavy duty drivers	4
9	Store Keeper	2
10	Electrician	2
11	Laborers	14
	Services	
12	Blasting Services	4
	Auxillary Staff	
13	Cooks	2
14	Cleaners	2
15	Police officers	2
16	Security	2
17	Medic	1
		55

Table 10. Staff list

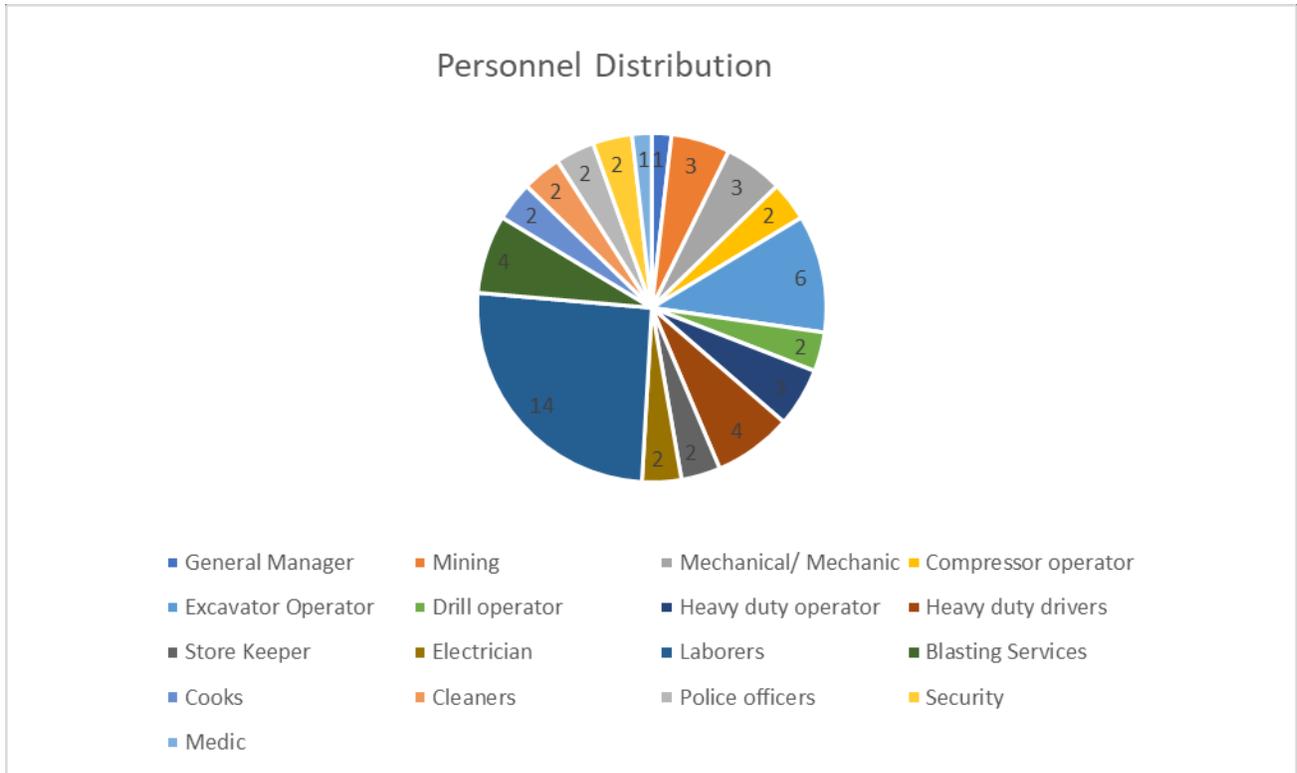


Figure 18. Personnel Distribution for Proposed Quarry Project

This labor force is expected to be increased by 67% or about 22 persons for the next five years.

16.2 Proposed Infrastructure

Detail of Building and Civil Works		
Description	Covered Area	Cost GUY\$
Offices/Prefabricated Containers	500	\$1,000,000.00
Workshop/Bond	1500	\$2,000,000.00
Residential Setup	2,000	\$3,000,000.00
/Prefabricated Containers		
Haul Road	3000	\$1,500,000.00
Total	7,000	\$7,500,000.00

Table 11. Total Cost for Infrastructure

17.0 Capital and Cost Estimates

17.1 Capital Cost Estimates

Life –of –Mine (LOM) Project Capital is summarized in Table 12 & 13. Initial capital Costs is USD \$3.2487 Million. Therefore, a total working capital of USD \$9.429 Million for total cost.

17.2 Operating Cost Estimates

LOM operating costs are summarized in Table 13. Operating costs are estimated at USD 14.49 million. Quarry mining will average USD 4.47/ t ore and waste moved. Processing is estimated at USD 2.35/ t ore crushed. G & A costs are estimated at USD 0.86/t ore and waste moved.

York Investment Inc. 94 Oronoque Street, Queenstown, Georgetown.
Itaca Quarry Project Summary
2021

Cost Item	LOM Costs \$USD	Unit Cost \$/ton-moved (USD)	Unit Cost \$/ton- crushed (USD)
Open Pit Mining	1,813,308.33	1.31	
Open Pit Drilling & Blasting	3,177,237.97	2.30	
Processing	3,248,792.27		2.35
G & A	1,190,476.00	0.86	
Totals	9,429,814.57	4.47	2.35

Table 13. Operating Cost

Quarry mining costs are estimated for total amount of saprolite and fresh rock mined. Quarry drilling and blasting costs had to be separated from these costs and applied to total fresh rock mined.

17.3 Financial analysis

Economic Results are summarized in Table 5; the analysis suggests the following conclusions assuming no gearing:

Mine Life: 5 Years

Pre-Tax NPV1%: USD

\$33,287,772.15

Post Tax NPV1%:

\$25,394,013.22

Pay-Back Post Tax: 1 year

Total Taxes Paid: USD \$7,893,758.93

Peak Funding of Initial Project Capital: USD \$9,429,814.57

York Investment Inc. 94 Oronoque Street, Queenstown, Georgetown.
Itaca Quarry Project Summary
2021

	Year 1 (GUY\$)	Year 2(GUY\$)	Year 3 (GUY\$)	Year 4 (GUY\$)	Year 5 (GUY\$)
SALES	\$ 1,500,000,000.0 0	\$ 1,575,000,000. 00	\$ 1,653,750,000. 00	\$ 1,736,437,5 00.00	\$ 1,823,259,375 .00
Operating cost	(\$175,149,250. 00)	(\$192,066,600. 00)	(\$209,285,825 .00)	(\$226,822, 018.75)	(\$244,691,02 9.69)
GROSS PROFIT	\$ 1,324,850,750.0 0	\$ 1,382,933,400. 00	\$ 1,444,464,175. 00	\$1,509,615, 481.25	\$ 1,578,568,345 .31
Administration, Rehabilitation and other expenses	\$50,000,000. 00	\$50,000,0 00.00	\$50,000,0 00.00	\$50,00 0,000.00	\$50,000, 000.00
NET PROFIT BEFORE TAX	\$ 1,274,850,750.0 0	\$ 1,332,933,400. 00	\$ 1,394,464,175. 00	\$1,459,615, 481.25	\$ 1,528,568,345 .31
Provision for taxation 20%	\$300,000,000 .00	\$315,000,00 0.00	\$330,750,00 0.00	\$347,287, 500.00	\$364,651,8 75.00
PROFIT / (LOSS) AFTER TAX	\$ 974,850,750.00	\$ 1,017,933,400. 00	\$ 1,063,714,175. 00	\$1,112,327, 981.25	\$ 1,163,916,470 .31
USD PROFIT/LOSS After tax	\$ 4,642,146.43	\$ 4,847,301.90	\$ 5,065,305.60	\$ 5,296,799.9 1	\$ 5,542,459.38

Table 14. Cash flow for Itaca Proposed Quarry

17.0 Environmental issues

York Investment Inc. quarry will carry out its operations in an environmentally responsible manner and will address all pertinent issues to insure proper stewardship of public lands and preservation of wildlife. A separate environmental assessment will be completed to further address the following and other issues of environmental concern. Details of the environmental mitigation measures to be employed at the quarry will be provided in the Environmental Management Plan (EMP). The EMP will address potential impacts of the design, construction, operation and closure phases of the quarry.

Air Quality: Dust and diesel emissions are the main elements of air quality concern at the quarry. To limit dust formation during mining and transport of materials at the site, water will be periodically sprayed on roadways, process areas and accessible working faces. Dust suppressants will also be used as required. Appropriate speed limits (30-15 mph) will be enforced within the

York Investment Inc. *94 Oronoque Street, Queenstown, Georgetown.*
Itaca Quarry Project Summary
2021

quarry and access road to limit fugitive dust, and spray bars will be installed at several points on crushing equipment to limit dust generation. Combustion emissions will result from the use of diesel and gasoline fueled equipment. Due to the small nature of the operation and the small number of heavy equipment to be used very minor changes in air quality resulting from equipment emissions is anticipated. Fueled equipment will be maintained according to the manufacturer's manual and kept in good working order.

Storm Water Runoff: Surface water from disturbed surfaces of industrial sites can cause pollution down gradient from areas of disturbance. The most likely form of down-gradient pollution is siltation caused as fine materials washed away from active mine operations are deposited in areas where such deposition is harmful to plants and wildlife. Because much storm water runoff is or will be captured by internal drainages associated with quarries, large amounts of storm water will not flow from the area of mining operations. Untreated discharge can result in increased turbidity in the receiving water bodies. Dewatering of the quarry of accumulated water resulting from surface runoff or ground water infiltration will require pumping excess water to the nearby creeks and may potentially impact surface water turbidity. Surface run-off will be directed to a settling pond. Excess water from the settling pond will be discharged to the Essequibo River through site drains to prevent overflowing and overtopping. Discharge from the settling pond under these circumstances will be monitored to ensure the compliance with water quality standards established by the EPA.

Ground Water: York Investment Inc. Quarry use only clean water and processes inert materials in his operations, it will not release pollutants into the ground-water table. Because it is planned that crushing equipment will be electric powered, fuel spill exposure on mining areas should be from mobile equipment only. Fuel, lubricants, coolant, waste oil, waste chemicals and hazardous materials will be stored in suitable clearly marked containers or surface tanks within impervious clay and or concrete bund walls to contain spillage. The storage areas will be completely covered to prevent any entry of rain and located away from operating areas, waterways and drainage lines and areas prone to flooding. The fuel and hazardous materials storage areas will be constructed with a containment capacity of 110% of the largest container stored. Discharges from the fuel storage and workshop areas will be directed to an oil/water separator before discharge to the environment.

Fire Safety and General Safety: Approved fire extinguishers will be located on all pieces of mobile equipment and in process control rooms. Heavy equipment and water will be available on site to assist in firefighting. Police and emergency medical services are readily available.

Cellular telephone service is available at York Investment Inc. quarry. All employees are trained in proper emergency response, incident reporting and general health and safety. The emergency response plan will outline the measures to respond to possible emergencies such as the unintended release of hazardous materials, fire and accidents at the site. York Investment Inc. Quarry also ensure that all employees are trained in emergency response scenarios.

York Investment Inc. Quarry maintains an emergency response outfit, which will be located at a strategic location within the Mine Site and equipped with communication equipment as well as equipment to respond to potential emergencies. The outfit will have the following equipment readily available at their disposal for emergency response:

- Designated evacuation vehicle; boat. Transport vehicles will be provided with emergency communication equipment.
- Earth Moving Equipment.
- Pumps.
- Earthen gravel; sand, clay.
- Booms and absorbents.

In the event of an emergency, an emergency alarm will be raised to alert all persons likely to be affected and to summon the emergency coordinator and crew. All personnel within the affected area will be evacuated to an established emergency assembly point. Emergency assembly areas will be clearly identified and communicated to all employees and visitors of the mine site.

In the event of a spill, the spill response and clean up procedures will be initiated. If there is a release of fuel oil or other hazardous material, all persons living downstream and downwind of the release will be notified. Spills will be contained by deploying relevant equipment such as booms in water and earthen material on land. In the event of a fire, water and/or other fire

suppressants shall be used. In the event of an accident, a first aider will render first aid care. The emergency response coordinator will make contact with the Bartica Public Hospital and inform them of the estimated time of arrival of the injured person. Details of the injuries sustained, and the state of the injured will also be communicated. The Coordinator will complete an accident report to be provided to the hospital on arrival of the injured. Emergency contact numbers/radio frequencies/satellite phone numbers/etc and for identified medical personnel, hospital, and police will be clearly posted at the mine and camp. An accident report will be prepared describing the cause and nature of the accident, and the remedial actions taken to prevent the reoccurrence of the accident. This report will be forward to the relevant regulatory agencies on request. For effective implementation of the EMP and for a safe and healthy work environment, training will be provided to all workers. A site induction will be conducted for all new workers. This policy will ensure that employees become familiar with potential hazards and safety precautionary measures in a quarry environment. The training program will be coordinated and implemented by the Environmental Manager.

Hazardous Materials: Diesel fuel and lubricants will be the major hazardous materials present at the quarry site. Care will be taken so that equipment lubricants, fuels and other industrial liquids do not drip or flow onto natural surfaces. Waste oil, other related fluids, filters, oily rags, etc., will be collected and disposed of properly. Large metal refuse containers will be positioned at the site for collection of hazardous waste materials.

Hazardous Waste: No hazardous waste is produced at the quarry. Any waste rock products will consist chiefly of biotite and hornblende.

Mine Safety: The quarry will be inspected periodically and will operate under applicable EPA and Guyana safety and health regulations. All employees will receive initial training before commencing work and annual refresher safety training. Impacts from blasting will be mitigated by:

- Ensuring prescribed procedures for blasting are followed, which include (1) assessing the type of rock formation; (2) determining the depth of drill holes and (3) determining the Frequency of Blasting and Type of Explosives used.

Itaca Quarry Project Proposal 2020

- Careful design of the blast sequence and ensuring detonation is designed using appropriate delay intervals for charge ignition to avoid detonation of large unconfined charges and to reduce air-blast and vibration effects. The use of electronic detonators will also be employed to reduce vibrations. The number of explosives used in the blast will be carefully administered to reduce fly rock.
- Ensuring that blast safe zones are established during blasting.
- Informing the residents of Batavia of blasting times in advance.
- Strict procedures for transport, storage and handling of explosive and blasting will be implemented in accordance with Mining regulations and the GGMC Code of Practice for Quarrying.
- A Certified Blaster will be recruited to supervise the blasting exercise, as required by law.
- Blasting will be done according to the Blasting Plan approved by the GGMC.

Blasting: Blasting will periodically be required at the quarry. All blasting will be conducted by qualified individuals in compliance with Guyana Laws. A buffer zone was created for the Bartica Airstrip and the outlying houses at minimum of 500 meters. Bartica is 13km away from the quarry. Blasting will occur only during workdays during daylight working hours such as to minimize impact to surrounding area. Noise limiting methodologies will also be used to lessen noise impact. Stakeholder consultations will be conducted with communities such as Bartica. Stakeholder engagement is an on-going process of sharing information and knowledge, seeking to understand the concerns of others and building relationships based on collaboration and partnership. Developing relationships with stakeholders is a long-term process, which will take place throughout the lifetime of the Quarry. The ultimate aim is to engage stakeholders as part of the project process to ensure that issues and concerns can be dealt with as quickly as possible thereby avoiding any potential conflict, and to build a general sense of goodwill towards the project.

Vibration and Noise: In addition to blasting, other mine operations including mechanical excavation, crushing and processing can produce significant noise and vibration. Best available practices of noise and vibration reduction will be utilized at the quarry and noise monitoring will

be conducted during initial mine operations. The project's operations will be associated with noise and vibration generating activities – excavation with machinery, drilling and blasting of rock, transport of boulders within the site and loading of barges are the critical noise generating activities. Excessive noise can affect workers and give rise to hearing loss, sleep disturbance and can also affect wildlife within the project area.

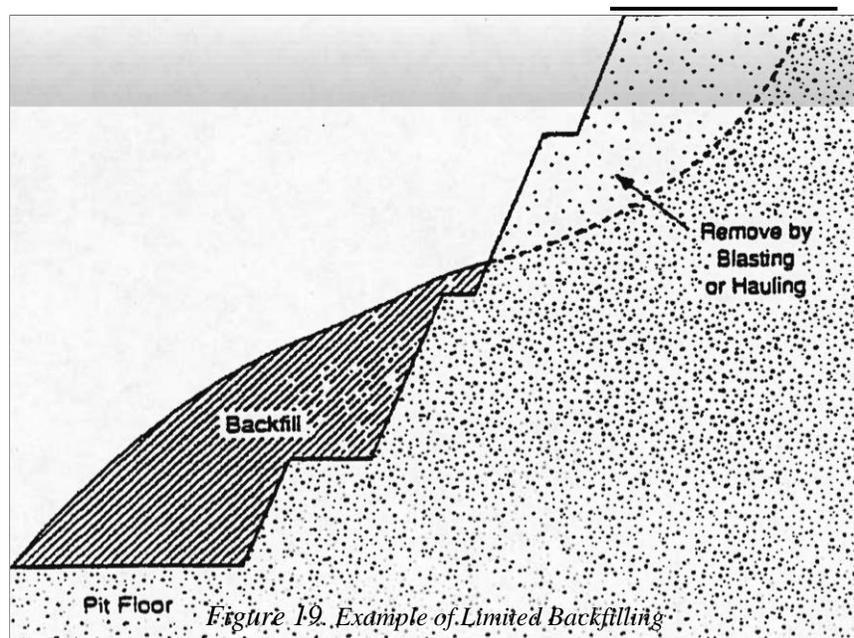
Noise will be mitigated by installing sound suppression equipment on vehicles, e.g. mufflers and ensuring vehicles are maintained according to the manufacturer's manual and are kept in good working order. Operators will be equipped with PPEs such as air plugs or ear muffs. Generators will be installed with sound proofing or at a safe distance away and downwind from the living quarters. Blasting will be implemented in accordance with Mining regulations and the GGMC Code of Practice for Quarrying. Careful design of the blast sequence and the use of electronic detonators will be employed to reduce vibrations. Quarry operations will comply with the decibel limits outlined in the GNBS Noise Emission Standard.

General Housekeeping: Operational litter will be collected in appropriate containers and removed as required from the site. No waste will be buried on site. A septic system on the land will be utilized

Waste and Ablution Facilities: Project activities is expected to produce both liquid and solid waste which, if not properly stored and or disposed can lead to pollution of receiving water bodies or accumulate on site creating an unhygienic and un-aesthetic environment. Improper management of domestic waste and sewage can pollute land and water resources in the area, resulting in health impacts on site. Waste generated will be collected, segregated, stored and transported to an on-site landfill constructed in accordance with the EPA Guidelines for establishing landfills. Domestic wastewater will be directed to a soak-away filter treatment system prior to discharge to the Mazaruni River. Discharges to the river will be in accordance with the EPA domestic wastewater discharge limits. All sewage will be directed to septic tanks with filter bed treatment installed.

18.0 Reclamation with limited backfilling

Reclamation at the York Investment Inc. quarry Expansion will proceed concurrently with mining wherever possible and shall be conducted in accordance with reclamation guidelines. As valuable material is mined out, those areas not to be affected by future quarrying operations will be reclaimed. Although it will be impossible to restore the land surface to its exact original configuration, it should be possible to reclaim the disturbed surface such that it closely matches the natural surface expression of adjacent undisturbed land. At closure, most pit walls will be reduced to a safe slope by such mechanisms as illustrated in the figure below



19.0 Approach and haul road maintenance

Approach and haul road and landing will be continually maintained throughout the life of the quarry. Roadside ditch line through the area will be re-established and grubbed out to convey surface flow so as to minimize erosion

20.0 Site clean up

Site cleanup works to be undertaken after cessation of extractive operations include;

- Removal of all fixed and mobile plant
- Removal of all temporary and permanent structures unless required for an agreed future use
- Leveling of noise control bunds
- Removal and burial of concrete slabs
- Rehabilitation of surplus roads, office sites and hard standing areas
- Identification of any hazardous or contaminated materials
- Approval to retain any of the infrastructure, which may be consistent with the proposed final land use, would be sought from the regulatory authority.

Appendix: Closure & Rehabilitation

The principal closure related issues relate to the quarry have been identified as: Final voids (pits) arising from the rock extraction; Waste dumps and disposal areas;

Surface water management, Infrastructure (general, haul roads, plant, buildings, tank farms etc.); and Retrenchment of employees.

Subsequent refinements of the closure plan will be influenced by consultations and will address in more details specific to closure issues and proposed options. It is anticipated that these will address, among other items, the following areas:

Pits: detailed proposals for the rehabilitation of the mined-out areas including the manner in which the actual site of the pit will be restored for future use. The proposal will be supported with relevant plans sections depicting the method of land restoration and rehabilitation.

Water quality management: detailed proposals for post-closure prevention and control of erosion, sedimentation, siltation and leaching to ensure appropriate water quality standards are achieved.

Waste management: description of the type, quantity and quality of overburden and other waste, their disposal, and detailed proposals for utilization and/or stabilization to prevent siltation, erosion, dust generation and maximize integration with surrounding land.

Infrastructure: facilities such as roads, power lines, buildings and structures and their future utilization will be evaluated and where relevant the measures for their maintenance will be described. If decommissioning is proposed, the dismantling and disposal of building structures, support facilities and other infrastructure (such as electric power lines, water pipelines, underground tanks, transformers etc.) will be discussed in detail. **Retrenchment:** description of the socio-economic opportunities in the area, inventory of employees and associated skills, formation of a plan to retrain and re-skill employees and facilitate re-employment to minimize impacts of retrenchment and to

ensure facilities and services provided are supported.

In the specific environmental and socio-economical context of the site, options for post closure land use with respect to these issues will be limited and technical constraints at the time of this assessment and the potential for long term quarrying activities in the surrounding areas. The first priority therefore must be to protect the environment and public health and safety by using safe and responsible closure practices. For each principal component of the project plan, a base case for post-closure land use has been identified, taking into account technical designs, the views of the stakeholders and emphasizing productive end use of each project area following appropriate rehabilitation.

York Investment Inc. 94 Oronoque Street, Queenstown, Georgetown.
Itaca Quarry Project Proposal 2020

Appendix: Gant Chart of Activities & Conceptual Flow chart



Figure 20. Planned Activities for the Five years

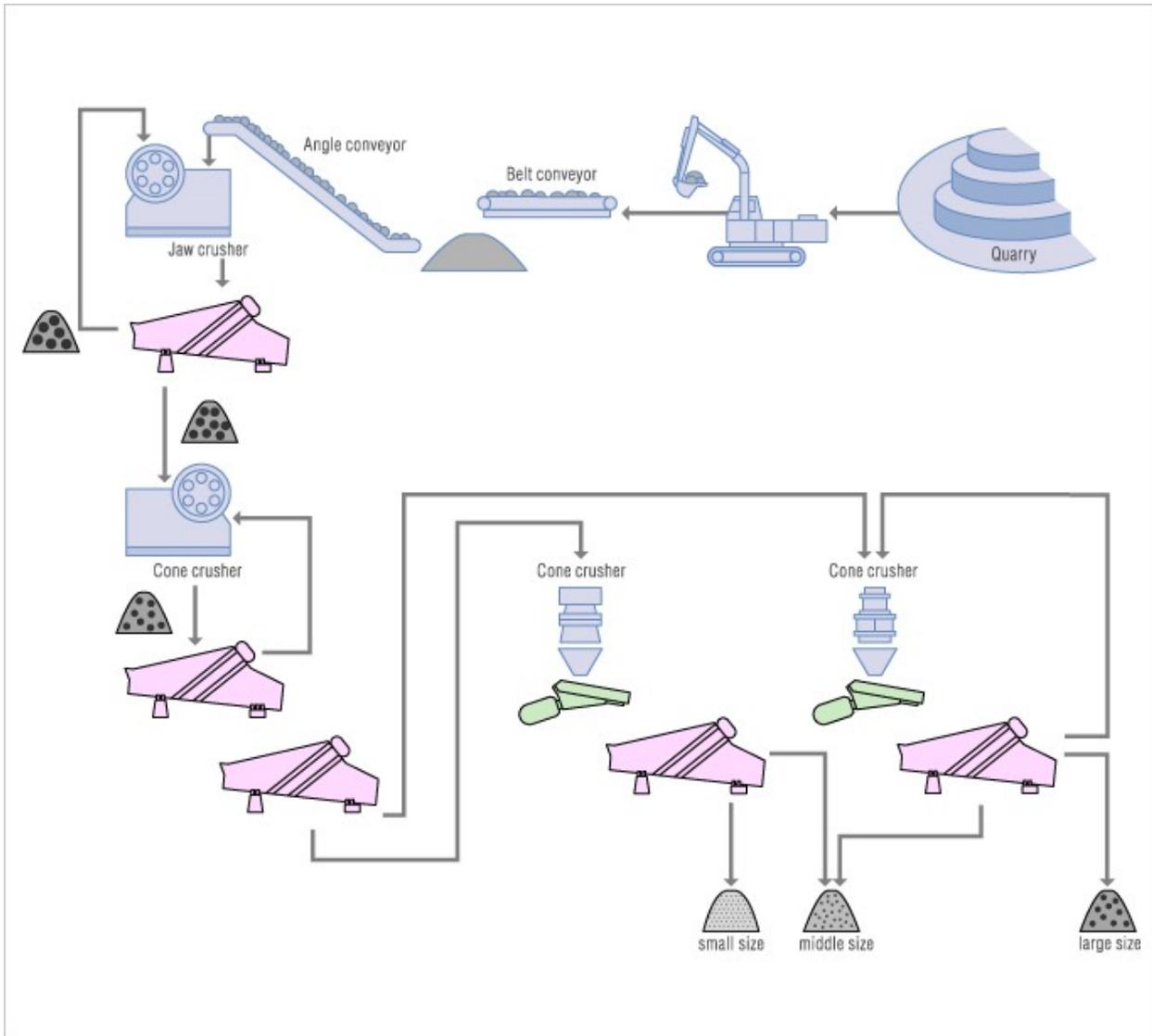


Figure 21. Conceptual Flow chart of Proposed Quarry

Appendix: Mine Layout

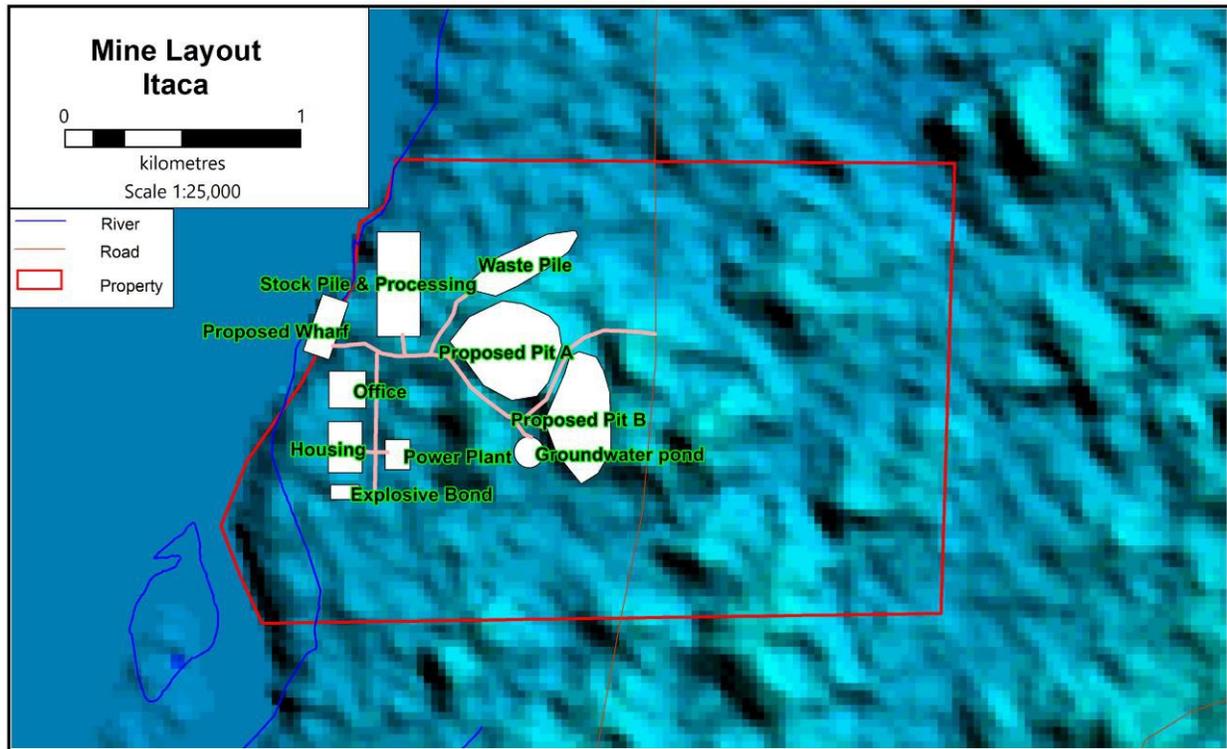


Figure 22. Mine Plan Layout