Executive Summary

E.1 Project Fact Sheet

Pertinent Project Information in support of the ECC request is provided in **Table E-1**.

Table E-1 Basic Project Information

Item	Information
Project Name	**Agata Limestone Project (ALP)**
Project Location	Brgys. Lawigan, Tinigbasan, Municipality of Tubay; Brgy. Colorado, Municipality of Jabonga; Brgy. E. Morgado, Municipality of Santiago Province of Agusan del Norte, Caraga Region
Nature of Project	Limestone Quarry Operations
Maximum Disturbed Area	554.4 hectares
Mineral Production and Sharing Agreement	MPSA No. 134-99-XIII 4,995 hectares Issued May 26, 1999
Project Proponent	Agata Processing Inc. (API) Agata Mining Ventures, Inc. (Project Operator)
Address	22/F BDO Equitable Tower Paseo De Roxas, Makati City
Contact Person	Emilio T. Figueroa III General Manager- Agata Limestone Project Email: emilio.figueroa@ agatamining.com.ph
Telephone No./ Fax No.	(02) 728 84 91 (AMVI Makati)

E.1.1 Ownership

The Project is covered by Mineral Production Sharing Agreement (MPSA) No. 134-99-XIII acquired by Minimax Mineral Exploration Corporation (Minimax) and has a total area of 4,995 hectares. It was approved by the Department of Environment and Natural Resources (DENR) on May 26, 1999 and registered with the Mines and Geosciences Bureau on June 17, 1999.

A Memorandum of Agreement (MOA) was signed by and between Mindoro Resources Limited (Mindoro) and Minimax on January 19, 1997, allowing Mindoro to conduct mineral exploration and development activities in the Contract Areas of Minimax in Surigao del Norte and Agusan del Norte including the MPSA-134-99-XIII tenement. Later, a Deed of Assignment was executed by and between Mindoro and MRL Nickel Philippines, Inc. (formerly MRL Gold Phils., Inc.) [MRL] and was signed on June 27, 1997 wherein the rights of Mindoro were assigned to MRL.

On September 25, 2012, MRL Nickel Philippines, Inc, Minimax Mineral Exploration Corporation, TVI Resource Development Phils., Inc. entered into Agata Processing Option and Joint Venture Agreement whereby Minimax will transfer the tenement to Agata Processing Inc., a joint venture Company between TVIRD (60%), MRL (15%), and Minimax (25%).

Minimax entered into an Operating Agreement with Agata Mining Ventures, Inc. (AMVI), wherein Minimax appointed AMVI as the sole and exclusive operator of the mining property and it was approved by the MGB on September 18, 2014. AMVI is also a joint venture Company between TVIRD (60%), MRL (15%), and Minimax (25%).

On April 22, 2014, a Deed of Assignment was executed between Minimax and Agata Processing Inc. (API) assigning, transferring and conveying to the latter all rights, interests and obligations of the former under the approved MPSA. This Deed of Assignment was approved by the MGB last June 21, 2016. All legal documents pertaining to transfer of MPSA is included in the **Appendices.**

E.2 Process Documentation

E.2.1 EIA Team

The EIS Report was completed through the joint effort of the in-house Environmental Management Team of API, and two (2) third-party consultant groups. The list of the EIA Team members is presented in **Table E-2**.

Table E-2 Agata Limestone Project EIS Preparers

No.	Name	Field of Expertise
Mr. E. Applied Environmental Sciences Consulting		
1	Ruben Estudillo	Marine Biology
Green Environment Defenders Consultancy		
1	Dr. Romell A. Seronay	Aquatic Ecology
2	Dr. Meljan T. Demetillo	Terrestrial Ecology (Flora)
3	Dr. Eve F. Gamalinda	Terrestrial Ecology (Fauna)
4	Engr. Arnold Apdohan	Hydrology, Watershed specialist
5	Mr. Leo Jude Villasica	Soil Science / GHG specialist
API In-house Technical Team		
1	Emilio T. Figueroa III	Mining Engineering, Planning and Design
2	Edsel M. Abrasaldo	Geology
3	Maria Krystell Banaag	Environmental Planning and Management
4	Jesalyn A. Guingguing	Environmental Planning and Management
5	Mary Jul S. Libarios	Environmental Science
6	Dhana Mae C. Ellarina	Mining Engineering
7	Renell V. Palaruan	Mining Engineering
8	Marichu L. Batingal	Mining Engineering
9	Neil Adrian S. Aynera	Mining Engineering
10	John Darwin S. Amag	Mining Engineering
11	Aldrin B. Arieta	Safety and Health
12	Jonathan Bañez	Social Development

There is no Disaster Risk Reduction and Climate Change Adaptation Training available yet to be attended by the preparers prior to the preparation of this document. A request for in-house online training from EMB-13 will be explored by the proponent to comply with the DRR-CAA training requirement for the preparers.

The Sworn Accountability Statement of the preparers is provided in the **Appendices.**

E.3.2 EIA Study Schedule

In conformance to the procedural requirement prescribed in revised Procedural Manual for DAO 2003-30 and the public participation requirements of DAO 2017-15: Guidelines on Public Participation under the Philippine EIS System, API have conducted a series of information, education, and communication (IEC) activities for the identified primary and secondary impact communities of the Agata Limestone Project in February and March 2020. Also, in February 2020, a Perception Survey among the residents of the identified impact communities was completed.

The consolidation of requirements to request for a Public Scoping Activity with the Environmental Management Bureau was already towards completion when the government put the National Capital Region and eventually the rest of Luzon under an Enhanced Community Quarantine (ECQ) in response to the threat of COVID-19 pandemic. This resulted to the suspension of the API's head office operation, as well as of the DENR and its line bureaus. Strict work suspension in Metro Manila under the ECQ status lasted until May 15.

Consultations with the EMB-case in the second half of May indicated that EMB was then developing a modified guideline for public scoping activities given the restrictions on mass gatherings imposed by the quarantine regulation. While waiting for the guidelines to be finalized, EMB allowed the proponent to proceed to the Technical Scoping to discuss the Terms of Reference. This will also allow the environmental impact assessment activities to commence, on the extent possible. The request letter for Technical Scoping was formally submitted by API last June 5, 2020. Attached to the request is a copy of the Project Description Report for Scoping, aerial photos of the Project site, proof of conduct of IEC activities, and the Initial Perception Survey Report. On July 9, the Technical Scoping Meeting was done via online conference (Zoom). The Technical Scoping Checklist signed by the EIARC, with the comments of the EIA Review Committee is included in the **Appendices**.

Later on, the interim guidelines for the public participation in the EIS process was released and the proponent was able to conduct the Public Scoping Activity on September 25, 2020. The summary of the issues and concerns during this activity is summarized in

Given the Technical References for the EIA study, the baseline data gathering, impact assessment and development of corresponding mitigating measures were documented in the EIS Report. The baseline environmental conditions presented in the EIS Report are based on the results of the environmental monitoring programs being implemented for the Agata Nickel Laterite Project (ANLP) given that the proposed ALP ECC area will overlap with the existing ECC coverage of the nickel project.

The overall schedule for the EIA activities is presented in **Table E-3.**

Table E-3 EIA Activities Schedule

Period	Activity
February 2020 to March 2020	IEC Activitities and Initial Perception Survey for Brgy. Tinigbasan and Brgy. Lawigan in Tubay
June 05, 2020	Submission of Project Description Report and Request for Technical Scoping
July 09, 2020	Project Briefing and Technical Scoping Activity with EMB and EIARC
Year 2019- present	Baseline data gathering through ANLP Monitoring Program
July- August 2020	EIS Report Preparation
August 2020	First Draft Report Submission
September 25, 2020	Public Scoping Activity
October 25, 2020	Second Draft Report Submission

The relevant environmental studies and monitoring data included in the impact assessment for ALP is summarized in **Table E-4.** Results of these studies will be discussed in **Section 2** of this report.

Table E-4 EIA Studies Completed

Date of Implementation	Environmental Study	In Charge/ Data Source
July 2020	Geohazard Assessment	API (In-house)
July 16-19, 2020	Terrestrial Flora and Fauna Study	Green Environment Defenders Consultancy
Year 2014-2019	Stteamflow Discharge Measurement	API (In-house)
Year 2012	Ocean Profile, Bathymetric Survey	Gaia South Inc.
Year 2019	Water Quality	API (In-house collection); Fastlab Testing
July 16-17, 2020	Freshwater Ecology Study	Green Environment Defenders Consultancy
Year 2014- 2016	Marine Environment Assessment	Mr. Ruben Estudillo
Year 2018- 2019	Air Emissions	API (In-house)
Year 2019	Meteorology	API (In-house)
Year 2019, Year 2020	Ambient Air and Noise Quality	Air Emission Estimation Training by EMB-13 Ambient Air and Noise Testing by Berkman Systems Inc.
Year 2018 to March 2020	Social Preparation	API (In-house)
February 2020	Perception Survey	Caraga State University

E.3.3 EIA Study Area

This proposed Agata Limestone Project area is within the 4,995 hectare MPSA area, designated as MPSA –134-99-XIII, granted to Minimax Mineral Exploration Corporation. The mining claim falls within the political jurisdictions of Brgys. Lawigan, Tinigbasan, Municipality of Tubay; Brgy Colorado, Municipality of Jabonga and Brgy. E. Morgado, Municipality of Santiago, Agusan del Norte in Caraga Region. The overall MPSA Contract Area, encompassing the Agata Project, is bounded by geographical coordinates 9°10'30" and 9°19'30" north latitude and 125°29'30" to 125°33'30" east longitude. The location of the MPSA and its technical coordinates are shown on **Table E-5.**

The EIA study for the Agata Limestone Project (ALP) is focused within a 554.4-hectare area, including the proposed quarry area, processing plant, stockyards, and the support facilities. The area is within the MPSA and overlaps with an Environmental Compliance Certificate (ECC) currently issued for the Agata Nickel Laterite Project (ANLP). The technical coordinates of the proposed ECC area for the ALP is presented in **Table E-6**. Its location relative to the MPSA and the ECC of ANLP is shown on **Figure E-1.**

Table E-5 MPSA 134-99-XIII Corner Points Survey and Geographical Description

Corner	Latitude	Longitude	Notes
1	9˚ 10' 30"	125˚ 32' 00"	
2	9˚ 11' 00"	125˚ 32' 00"	
3	9˚ 11' 00"	125˚ 33' 00"	Parcel I
4	9˚ 10' 30"	125˚ 32' 00"	
1	9˚ 12' 30"	125˚ 31' 22.5"	
2	9˚ 13' 15"	125˚ 31' 22.5"	
3	9˚ 13' 15"	125˚ 31' 00"	
4	9˚ 13' 30"	125˚ 31' 00"	
5	9˚ 13' 30"	125˚ 30' 52.5"	
6	9˚ 14' 22.5"	125˚ 30' 52.5"	
7	9˚ 14' 37.5"	125˚ 30' 30"	Parcel II
8	9˚ 14' 37.5"	125˚ 30' 22.5"	
9	9˚ 15' 45"	125˚ 30' 22.5"	
10	9˚ 15' 45"	125˚ 30' 30"	
11	9˚ 16' 30"	125˚ 30' 30"	
12	9˚ 16' 45"	125˚ 30' 22.5"	
13	9˚ 18' 00"	125˚ 30' 22.5"	
14	9˚ 18' 30"	125˚ 30' 07.5"	
15	9˚ 18' 30"	125˚ 30' 00"	
16	9˚ 19' 00"	125˚ 30' 00"	
17	9˚ 19' 00"	125˚ 29' 45"	
18	9˚ 19' 30"	125˚ 29' 39.3"	
19	9˚ 19' 30"	125˚ 30' 00"	
20	9˚ 19' 00"	125˚ 30' 00"	
21	9˚ 19' 00"	125˚ 31' 30"	
22	9˚ 18' 30"	125˚ 31' 30"	
23	9˚ 18' 30"	125˚ 33' 30"	
24	9˚ 16' 00"	125˚ 33' 30"	
25	9˚ 16' 00"	125˚ 33' 00"	
26	9˚ 16' 30"	125˚ 33' 00"	
27	9˚ 16' 30"	125˚ 32' 30"	

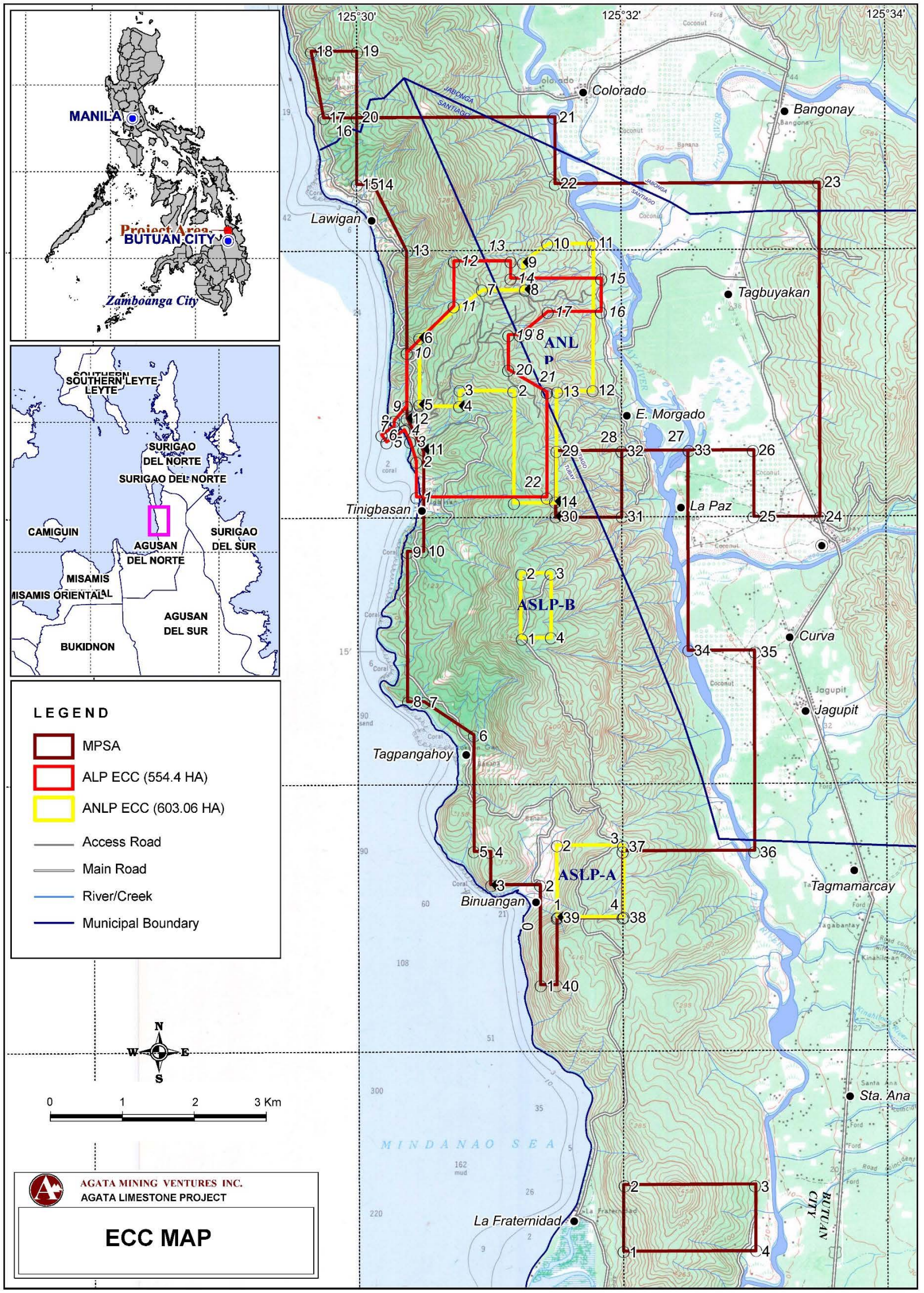
Table E-5 MPSA 134-99-XIII Corner Points Survey and Geographical Description (continued)

Corner	Latitude	Longitude	Notes
28	9˚ 16' 30"	125˚ 32' 00"	Excluded
29	9˚ 16' 30"	125˚ 31' 30"	
30	9˚ 16' 00"	125˚ 31' 30"	
31	9˚ 16' 00"	125˚ 32' 00"	
32	9˚ 16' 30"	125˚ 32' 00"	
33	9˚ 16' 30"	125˚ 32' 30"	
34	9˚ 15' 00"	125˚ 32' 30"	
35	9˚ 15' 00"	125˚ 33' 00"	Parcel II
36	9˚ 13' 30"	125˚ 33' 00"	
37	9˚ 13' 30"	125˚ 32' 00"	
38	9˚ 13' 00"	125˚ 32' 00"	
39	9˚ 13' 00"	125˚ 31' 30"	
40	9˚ 12' 30"	125˚ 31' 30"	

Table E-6 Agata Limestone Project ECC Corner Points Survey and Geographical Description

Corner	Latitude	Longitude
1	125° 30' 29.9988"	9° 16' 09.4944"
2	125° 30' 29.9988"	9° 16' 30.0000"
3	125° 30' 22.5000"	9° 16' 45.0012"
4	125° 30' 22.5000"	9° 17' 14.4816"
1	125° 30' 43.8948"	9° 17' 35.3508"
2	125° 30' 44.0388"	9° 17' 55.4676"
3	125° 31' 09.7788"	9° 17' 55.2876"
4	125° 31' 09.7248"	9° 17' 47.6556"
5	125° 31' 50.9412"	9° 17' 47.3640"
6	125° 31' 50.8332"	9° 17' 32.4528"
7	125° 31' 26.6520"	9° 17' 32.6220"
8	125° 31' 13.9728"	9° 17' 22.2072"
9	125° 31' 08.7096"	9° 17' 22.2432"
10	125° 31' 08.5980"	9° 17' 06.6804"
11	125° 31' 26.1480"	9° 16' 56.4492"
12	125° 31' 25.8960"	9° 16' 09.1452"
13	125° 30' 29.9988"	9° 16' 09.4944"
14	125° 30' 29.9988"	9° 16' 30.0000"
15	125° 30' 22.5000"	9° 16' 45.0012"
16	125° 30' 22.5000"	9° 17' 14.4816"

Figure E-1 Proposed ALP ECC and ANLP ECC Location Map



E.3.4 EIA Methodology

The environmental baseline reflected in **Section 2** of this EIS Report include third-party study conducted recently and results of the monitoring activities regularly conducted for the Agata Nickel Laterite Project. Various data were also collected from local, regional and national government agencies to supplement the monitoring data collected on site. Specific methodologies and data sources used in the EIA study relative to land, water, air and noise aspects are summarized in **Table E-7.**

Table E-7 Methodology of Environmental Baseline Studies

Environmental Study	Sampling and Analytical Method/ Data Source
Soils and Land Use	Mapping data from NAMRIA; Land Use and Classification Maps from DENR Land Use Plan from LGU
Geohazard Assessment	Geohazard Mapping based on Local Government Agencies (MGB, Phivolcs) data
Geology	Geological Information from In-house reports and Secondary sources (published reports, database of MGB, Philvocs)
Terrestrial Ecology (Flora and Fauna)	Flora: Quadrat Sampling and Transect Method Fauna: Transect Method , Observation, and Species collection
Hydrology	On-site observation (rainfall monitoring data); Secondary data sources (PAGASA, published reports) Watershed Mapping and Streamflow measurements
Oceanography	Bathymetric Survey
Water Quality	Water quality sampling based on EMB Water Quality Monitoring Manual; In-situ measurements (pH, temperature, DO) using portable equipments; Third party laboratory analysis a. Metals- Atomic Absorption Spectrophotometry (AAS) b. Solids (TSS)- Gravimetric Methods c. Bacteriology- Multiple fermentation tube technique d. BOD- BOD Analyzer e. Chloride- Titrimetric Method f. Color, Nitrate, Phosphate- Colorimetric Method g. Oil and Grease- Hexane extraction and gravimetry
Freshwater Ecology	Reach-wide benthos (Multihabitat) procedure of SWAMP (2007) Paleontological Statistics Software (PAST®).
Marine Environment	SCUBA Diving to determine a. Coral Cover- Photo Quadrat/ Coral Belt Transect Survey b. Associated Reef Fish- Fish Visual Census/ Transect Survey c. Macrobenthic Invertebrates- Coral Belt Transect Survey d. Siltation Rate- sediment trap monitoring e. Colony Size- Photo Quadrat/ Coral Belt Transect Survey
Climatological data	On-site observation (rainfall monitoring data) Secondary data sources (PAGASA, published reports)
Ambient Air and Noise	Noise level: Sound level meter TSP: High Volume- Gravimetric Method PM10: Gravimetric Method
People	Perception Survey Focused Group Discussion Secondary data sources (Brgy. Development Plan)

E.3.5 Public Participation

Following the Public Participation Guidelines under the Philippine EIS System set by DAO 2017-15, the EIA process started with stakeholder identification to determine the target participants for the series of Information, Education, and Communication (IEC) activities to be conducted for the project awareness.

Information dissemination regarding the Agata Limestone Project was conducted as early as September 2018 when the company first initiated for a conduct of Public Scoping. The Community Relations Office (CRO) of API was able to conduct project presentation to the Mayors of the three (3) LGUs (the Municipality of Tubay, Jabonga, and Santiago) with the jurisdiction over the MPSA area. Also included in this general IEC are the following barangays, namely Brgy. Tinigbasan and Brgy. Lawigan in Tubay; Brgy. Colorado in Jabonga; and Brgy. E. Morgado in Jabonga. A Perception survey done to these barangays indicated positive acceptance to the project as early as 2018. The company was preparing for a larger Public Scoping activity around June 2019 when the demand of the prospect off-take buyer has significantly changed, leaving the ALP with no reliable market for its limestone products. The ECC application, along with the scoping request was then deferred by API.

When the market for Limestone improved, the company decided to revive the ECC application starting with the series of IEC activities. The Regional Directors of DENR-MGB 13 and DENR-EMB 13 were visited for a project presentation. At this point, the impact area of the project is more defined, and which identified Brgy. Tinigbasan as the host community and Brgy. Lawigan, as the neighboring community. Both are located within the Tubay municipality. The map of the impact area is shown **Figure E-2.** The CRO relaunched a more detailed project presentation and focused group discussion and covered the LGU officials of the municipality of Tubay, Brgy. Lawigan and Brgy. Tinigbasan. In addition, a Perception Survey were also conducted among 192 residents of the two impact barangays. The result of the survey indicated awareness and positive acceptance from the community.

A summary of the IEC Activities conducted for the project is presented in **Table E-8.** Documentation of IEC Activities are attached in the **Appendices.**

Table E-8 IEC Activities for ALP

Period	Activity
September 2018	IEC Activitities and Initial Perception Survey for Brgy. Tinigbasan and Brgy. Lawigan in Tubay; Brgy. Colorado in Jabonga; and Brgy. E. Morgado in Jabonga.
July 2019	Withdrawal of ALP ECC Application
February 2020 to March 2020	IEC Activitities and Initial Perception Survey for Brgy. Tinigbasan and Brgy. Lawigan in Tubay
July 09, 2020	Project Briefing and Technical Scoping Activity with EMB and EIARC
September 25, 2020	Public Scoping Activity

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The Public Scoping Activity was supposedly scheduled after the submission of Scoping Request in June 2020, however due to the community quarantine restrictions in mass gatherings, the EMB Central Office allowed ALP to proceed to the Technical Scoping Meeting. An interim guideline on the public participation in EIA process was released on July 29, 2020, allowing the conduct of Public Scoping Activity either through online platform (i.e. video conference) or small group discussion following the minimum health protocols prescribed by the Inter-Agency Task Force (IATF) for COVID -19 management. The proponent chose the latter and conducted the Public Scoping Activity last September 25, 2020 at Loreta Convention Hall in Cabadbaran City, Agusan del Norte.

The public scoping event, aimed to provide an information regarding the proposed project and solicit concerns from the stakeholders, was conducted in two sessions to maintain a small group of attendees. Around 70 people responded to the invitation for public scoping, including the representatives from the host communities (Brgys. Lawigan and Tinigbasan), local people's organization, civil society groups, regional regulatory agencies (DENR, EMB, NCIP), and from the company.

The concerns raised during the open forum are mostly related to the employment opportunities arising from the Project, particularly on who must be priority for hiring and what are the skills requirement to be qualified. There were requests for the Company to provide skills enhancement training to improve the employability of the community members. The Company assured the audience that there is a process followed in hiring and that skills training program can be included in the current SDMP and implemented next year.

For the environmental impacts, the concerns mentioned are related to the air and noise pollution from mining and blasting activities, possibility of landslide from irresponsible mining protocols, and the possible adverse effect of the project to the water sources. To which the company representatives responded by assuring that these are all included in the impact assessment study, and that findings and the proposed mitigation will be presented in the Public Hearing activity.

A summary of the issues and concerns raised during the Public Scoping Activity is presented in **Table E-10**, while the documentation of the Public Scoping activity is included in the **Appendices.**

Figure E-2 Project Impact Areas Map

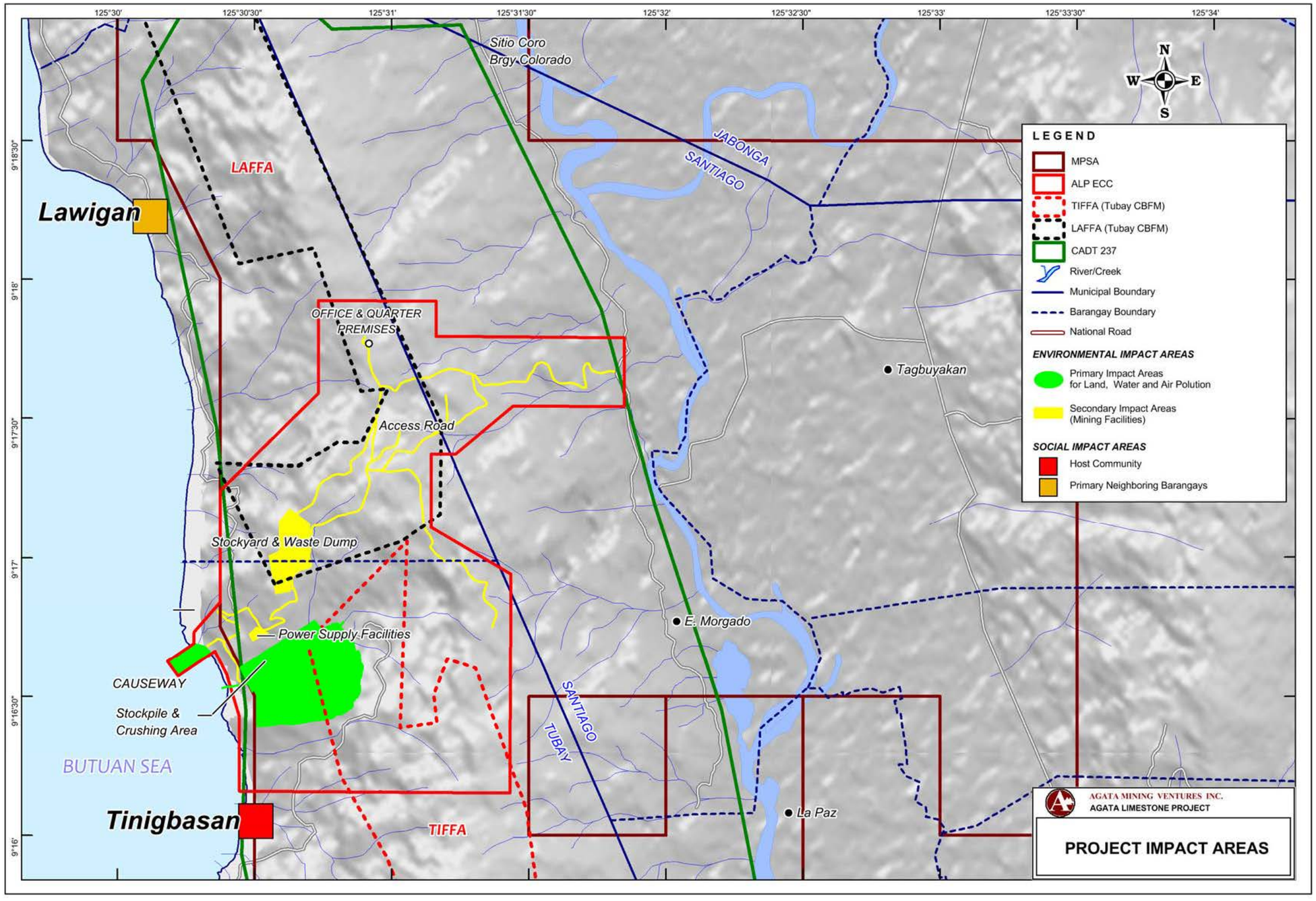

Table E-9- Summary of Issues and Concerns- Public Scoping Activity for Agata Limestone Project

Raised By	Issue/ Concern	Respondent	Response
Morning Session			
Ms. Edgielit Pajarillo, NCIP Santiago OIC	Ms. Pajarillo asked if the IPs were already informed and are aware of the new project, i.e. if they are aware on the possible effects of limestone mining, whether the impactswill be the same with nickel mining. Ms. Pajarillo also asked for the technical description of the Agata Limestone Project to ensure if the project area covers either CADT 237 or CADT 092. Lastly, she stressed out the importance of the IPs being informed about the new project. Ms. Pajarillo asked for a copy of the MOA to check if the proposed other minerals apart from nickel is mentioned or is part of it.	Mr. Jonathan Bañez, API CRO Manager	Mr. Bañez assured that the IPs are already informed about the limestone project. He also clarified that the limestone project area is within CADT 237 and is way far from CADT 092. He added that this sectoral concern will be further discussed in the afternoon session where the IPs are among the attendees. Mr. Bañez agreed to officially transmit a copy of the MOA and the technical description as requested by Ms. Pajarillo.
Kagawad Glen Capon, Brgy. Tinigbasan	Kagawad Capon asked for the mitigating measures that will be implemented to address air and noise pollution. He mentioned that these impacts are inevitable since there will be blasting activities.	Ms. Jesalyn Guingguingg, API MEPEO Manager	Ms. Guingguingg assured that although the limestone project will involve blasting, the controlled blasting will be employed, similar to the practice in the visited Limestone Operations in Bohol. Ms. Guingguingg continued by citing specific mitigation measures that will be implemented such as, blasting only when necessary and advanced public notification of blasting schedule. These measures will be provided in detail during the Public Hearing activity. She concluded by mentioning a possible learning visit to the Bohol Limestone operation, for benchmarking so they can better imagine how the limestone project will be operated.
Brgy. Captain of Dante Mandam, Brgy. Tinigbasan	Capt. Mandam pointed out that he is most concerned about the welfare of his constituents. He suggested if the company and the barangay can make an agreement that every demand and request of his people will be addressed. He also requested if people from Tinigbasan can be prioritized for employment.		

Table E-10 Summary of Issues and Concerns- Public Scoping Activity for Agata Limestone Project (continued)

Raised By	Issue/ Concern	Respondent	Response
Brgy. Captain Mordeno, Brgy. Lawigan	Capt. Mordeno requested that that the presentation should not only focus on the host barangay, but should also include the neighboring barangay.	Ms. Jesalyn Guingguingg, API MEPEO Manager	Ms. Guingguingg apologized for not including the neighboring barangay in the presentation, but assured Capt. Mordeno that in the report discussion, both the host and neighboring barangays are included. She also clarified that Brgy. Tinigbasan is the host community of the limestone project and Brgy. Lawigan is a secondary impact community.
Kagawad Richard Abgao, Brgy. Tinigbasan	Kagawad Agbao expressed his concern regarding the skills qualification of their constituent for the project. He suggested that being the host community, the company should conduct TESDA Training in their barangay to help the people become qualified for the job.	Mr. Jonathan Bañez, API CRO Manager	Mr. Bañez mentioned that the company follows a process regarding skills training. In fact, the company is already looking for trainings that are suitable for the skills needed for theproject.
Afternoon Session			
President of Women's Association of Brgy. Tinigbasan	Madame President expressed his concern on the karstic characteristic of limestone, wherein it forms holes or cavities. She is worried that landslide will occur in Brgy. Tinigbasan should the excavation reached its maximum capacity	Ms. Jesalyn Guingguingg, API MEPEO Manager	Ms. Guingguingg reiterated that the purpose of the public scoping is gathering of concerns. The technical team of API, in charge of planning and design will be providing a more detailed explanation on this impact, as well as corresponding measures, during the Public Hearing activity. Ms. Guingguingg added that similar to what has been done to the nickel operation, proper benching and drainage system will be in place. She reiterated that the detailed plan will be presented during the public hearing.
		Engr. Renell Palaruan, API Mining Engineer	Engr. Palaruan assured the audience that proper mine planning and design is employed to determine how to mine the area responsibly. He added that stability of the soil is considered in mine planning, same as the type of the underlying rock for the proper bench design. Drainage will also be installed to ensure stability of the soil and prevent the occuence of landslides. Engr. Palaruan also ensured that they will take note of this concern and propoerly study the area so that land slides will be prevented.

Table E-10 Summary of Issues and Concerns- Public Scoping Activity for Agata Limestone Project (continued)

Raised By	Issue/ Concern	Respondent	Response
Afternoon Session			
		Mr. Raymond Deguerro, EMB-13	Mr. Deguerro informed the audience that in case that mitigation measures are in place and still landslide occurred due, the Environmental Guarantee Fund (EGF), which is required by EMB to be set up by the proponent, can be used to compensate for damages resulting from such incidents. He however clarified that the fund will only be available to compensate damages from the failure of the company's mitigating measures, and not from natural phenomenon unrelated to Agata operations.
Mr. Narciso Dela Sala Officer, Tinigbasan Farmers and Fisherfolks Association (TIFFA)	Mr. dela Sala first shared how he witnessed Agata has helped Brgy. Tinigbasan. He cited the significant contribution of the company in the livelihood assistance, particularly by giving out motorized boats that they are able to use for their livelihood. For his question, Mr. dela Sala asked what is the percentage of employment will likely be coming from Brgy Tinigbasan.	Ms. Jesalyn Guingguingg, API MEPEO Manager	Ms. Guingguingg mentioned that similar concerns on employment and skills development were raised during the morning session an that it was mentioned that there should be trainings for the people of the barangay so they can acquire the necessary skills to be qualified for the job to be offered by the project. She mentioned that as of now, the company cannot give a definite percentage, especially now that the project is still under study. But she assured that this concern will be looked at in the project planning.
	In his follow up question, Mr. dela Sala asked what will be the benefits of the TIFFA from the Project. He mentioned that if there is no direct benefit, it is fine as long as the rate of employment in the Barangay will increase. He added that he went to Garcia Limestone Project site in Bohol and saw that their expection from a blasting activity is really far from what they saw in actual operations. He saw that the air pollution he's expecting from the use of dynamite in blasting is not really a problem for a limestone mining. He then recommended if the company can also bring the people from Tinigbasan, especially the senior citizens and anti mining groups, to the Garcia Bohol limestone site so they can see the actual operation.	Mr. Jonathan Bañez, API CRO Manager	Mr. Bañez responded that the tour is already scheduled this year but then COVID-19 happened, making it difficult to travel there. He said that when travel restrictions are no longer in place, the company will ensure that the mine tour will go as planned. He then commended TIFFA for being supportive of the Agata program activities since the beginning and he hoped for a continued support from them for the Limestone Project.

Table E-10 Summary of Issues and Concerns- Public Scoping Activity for Agata Limestone Project (continued)

Raised By	Issue/ Concern	Respondent	Response
Afternoon Session			
Mr. Prudencio Gayo President, TIFFA	Mr. Gayo expressed his confidence with the Agata's MEPEO Manager on how she is able to manage environmental impacts using a macro perspective, and how he is not worried of the landslide issue raised by the President of Women's Association. His concern is more on the employment. He recommended that it is better to prioritize hiring the existing workers when the Limestone Project commences. And he also suggested that if possible, better if the company can provide skills training for the barangay, for instance heavy equipment operation to upgrade their skill and employability. As a follow up, Mr. Gayo asked if the SDMP from the nickel laterite operation will be continued during the limestone project.	Engr. Anthony Quijano, API Assistant General Manager	
Ms. Cora Vertido representative of St. Anne Parish	Ms. Vertiddo asked what are the skills and trainings needed for the limestone project so that the community can prepare to improve their employability.	Engr. Anthony Quijano, API Assistant General Manager	AGM Quijano mentioned that skills immediately needed will be related to the crushing plant and heavy equipment oeration. Moving forward, the company will look into forecasting the necessary skills for the projects so that they can be developed, say through tarining and scholarship.
Mr. Carlito Belleza representative of Senior Citizens of Brgy. Tinigbasan	Mr. Belleza asked if Brgy. Tinigbasan will be the primary impact area, why the other barangays are also invited in the public scoping. He thinks that others will easily accept the project being not directly affected. He said that the Brgy. Tinigbasan community will be supporting the project since it is inevitable but company should ensure that people from Tinigbasan should benefit from employment opportunities.	Mr. Jonathan Bañez, API CRO Manager Ms. Jesalyn Guingguingg, API MEPEO Manager	Mr. Bañez responded that Brgy. Tinigbasan may be the primary impact area but there are also neigboring communities who will be affected so they have to be invited in the public scoping. Ms. Guingguingg added by explaining that the PD 1586: Philippine Environmental Impact Statement System requires that the neighboring communities be identified as well. She defined primary impact community as where the project will be situated, that is Brgy. Tinigbasan, while secondary impact areas are where downstream impacts such as dust pollution and impacts from the loading vessel may be experienced, hence should be considered as well. She emphasized that Brgy. Tinigbasan being the primary impact area will be getting a bigger share of the benefits, but the identified neighboring communities will benefit from the project as well.

Table E-10 Summary of Issues and Concerns- Public Scoping Activity for Agata Limestone Project (continued)

Raised By	Issue/ Concern	Respondent	Response
Afternoon Session			
Senior Citizen representative	He espressed concern on water resources being affected by the project operation and appealed if the company can look after air and water resources to ensure they will not be adversely affected.	Ms. Jesalyn Guingguingg, API MEPEO Manager	Ms. Guingguingg explained that the water source of the community is distantly located in the limestone mining area. However, this will still be part of the study of the project impacts. The findings on the potential water pollution, as well as the monitoring and mitigation will be included in the Public Hearing activity.
Father of St. Anne Parish	Father reminded everyone in the audience to think of the long-term benefit that they will be getting from the project. He explained that it is easy to get overwhelmed with the immediate benefits such as salary and SDMP programs that the project will give the community but in the end, the project will only be 15-years. The more important aspect is for the community to use the benefits in preparation for a more sustainable development of the community and livelihood so that the benefits can be continuously reaped even after the project ends.		
Datu Raymond Moron, IP Sector	Datu Moron clarified if another Certificate of Precondition is required from the company since the CP obtained before is for the nickel laterite operations.	Mr. Raymond Deguerro, EMB-13 Mr. Jonathan Bañez, API CRO Manager	Mr. Deguerro referred to the NCIP statement that if the original CP only refered to the nickel laterite project, then it has to be amended. Mr. Bañez reiterated that CADT 092 is very far from CADT 237, and the project is only covered by the latter. With regards to the CP, he added that the CP and the MOA did not specified a particular mineral but instead mentioned “all minerals”.
Mr. Narciso Dela Sala Officer, Tinigbasan Farmers and Fisherfolks Association (TIFFA)	Mr. Dela Sala clarified if the TIFFA will be receiving other share aside from the SDMP, since most of the people from Brgy. Tinigbasan are members of TIFFA.	Ms. Jesalyn Guingguingg, API MEPEO Manager	Ms. Guingguingg mentioned that this can be for further discussion and may be included as part of the agreement with the Brgy. Tinigbasan LGU.
Mr. Carlito Belleza representative of Senior Citizens of Brgy. Tinigbasan	Mr. Belleza reiterated the need to prioritize residents from Brgy. Tinigbasan in the project hiring, being the promary impact community.	Ms. Jesalyn Guingguingg, API MEPEO Manager	Ms. Guingguingg noted this request.
Mr. Flores	Mr. Flores expressed he is hopeful that the technical skills training can start soon so the people of Brgy. Tinigbasan can be prepared to apply soon.	Mr. Jonathan Bañez, API CRO Manager	Mr. Bañez noted the request and mentioned that the company will start to look for trainings that can be offered for the community by the following year.

E.3 EIA Summary

E.3.1 Project Alternatives

There are no alternatives identified for the project site location as it was determined by the setting of the deposit. The processing facility was strategically chosen to be situated near the mineralized area to minimize the hauling distance from quarry to plant facility. Moreover, the chosen site is also near the causeway, where the loading activities will be performed, minimizing handling and hauling cost. There are also no siting alternatives considered for the auxiliary facilities as most of them are existing facilities of the ANLP and will be continuously used during ALP operations.

The project siting, water, and power source considerations are summarized in **Table E-11**.

Table E-10 Project Siting and Resource Alternatives

Component	Alternatives	Decision Criteria
Ore Resource	Alternative 1: Nickel Laterite Deposits	• Agata North Laterite Project (ANLP) is ongoing; Nickel Laterite deposit is near depletion.
	Alternative 2: Gold and Copper Deposits	• Gold deposits within the MPSA boundary are currently deemed not economically feasible to mine. • Further exploration work is needed.
	Alternative 3: Limestone Deposit ***(selected)***	• The limestone deposit is found to be a high-grade resource of $CaCO_3$/CaO. • Project can promote continuity of employment opportunities for the community after the ANLP ends. • Project can supplement the demand for aggregates and cement industries in Mindanao and nearby regions.
Mine Site	Payongpayong, Brgy. Tinigbasan, Tubay ***(selected)***	• Location of the limestone ore deposit. • Site is considered with low flood susceptibility but with high landslide susceptibility according to the Mines and Geosciences Bureau; therefore, ground stability techniques should be utilized.
Crushing Plant Site	Alternative 1: Flat area north of deposit	• Identified location of the stockpile area. • Location far from the causeway, increasing hauling costs.
	Alternative 2: Northwest of deposit ***(selected)***	• Location is near relative to both the deposit and the causeway. • Streamlining the transport of ore from mining to product delivery.
Resource Utilization (Power)	Power Alternative 1: Local grid ***(selected, main)***	• Current ANLP project is tapping ANECO for the power source. • ALP can expand the existing infrastructures up to the crushing plant.
	Power Alternative 2: Generator sets ***(selected, secondary)***	• Generator sets will be used in case of power interruptions or as additional source of power.

Table E-11 Project Siting and Resource Alternatives (continued)

Component	Alternatives	Decision Criteria
Resource Utilization (Water)	Water Alternative 1: Payongpayong creek ***(selected)***	• Payongpayong Creek will be the source of freshwater for water lorries and Land Craft Transport (LCT)
	Water Alternative 2: Payton Creek ***(selected)***	• Payton Creek will be the source of water for the campsite/ domestic water requirements.

For the mining method, quarrying which is the most widely accepted method on limestone deposit recovery is selected. Crushing and screening will also be carried out to produce the desired sizes of limestone products. The method and technology selection criteria are summarized in **Table E-12** below.

Table E-12 Technology and Process Alternatives

Component	Alternatives	Decision Criteria
Mining Method	Surface Mining (Quarrying) ***(selected)***	• The geology and mineralization within the area is shallow and suggests a surface mining approach following technical and economic considerations. There is no other method considered given this type of deposit.
Blasting	Alternative 1: Electrohydraulic blasting	• This blasting method is still unproven. • Requires large amount of water and power utilization.
	Alternative 2: Conventional rock blasting ***(selected)***	• Site is not considered an area susceptible to liquefaction according to PHILVOCS. • Controlled blasting to be implemented to minimize effects of noise, vibrations and dust.
	Alternative 3: Dozer ripping (or no blasting)	• Ripping will be done when competence of the ore will not require blasting.
Comminution	Crusher Alternative 1: Jaw crusher	• Jaw crusher is a commonly used primary crusher and is best suited for high hardness rocks.
	Crusher alternative 2: Impact crusher ***(selected)***	• Impact crusher is used to minimize production of unwanted fine products. • Impact crushers have higher crushing efficiency than jaw crushers.

E.3.2 Summary of Baseline Characterization

The summary of the baseline data for the Agata Limestone Project is presented within this section. The baseline characterization focuses on the existing environmental and social conditions relative to the land, water, air and noise, and people resources.

The majority of the baseline information is from the latest monitoring data of the ongoing Agata Nickel Project considering that the proposed limestone project will be situated in the same area as the nickel operations, and that some of the existing facilities will be continuously utilized in the proposed project. Supplemental information is gathered as necessary, through in-house monitoring, third party consultants, and data from government agencies, both local and national.

E.3.2.1 Land Resources

A. Land Use

The project is in the coastal Municipality of Tubay, Agusan del Norte with a total land area of 13,800 hectares and constitutes 5.06% of Agusan del Norte's total area. The urban area covers 2.97% of the total area, while the rural areas cover the dominant 97.03%. The municipality has 13 barangays, with the primary impact area in Barangay Tinigbasan while the secondary impact area includes Barangay Lawigan.

The Agata Limestone Project area is generally characterized by three ecosystem types; forest over ultramafic rocks, tropical lowland evergreen rain forest and plantations. The ultramafic forest is the primary vegetation type with only a few tall and large trees. The tropical lowland evergreen forest is found in patches throughout the Project area and may be remnants of the vegetation that previously existed. The forest patches are generally found along the ridges and the streams/valleys within the Project area.

Based on the 2019 Land Classification Map from PENRO Agusan del Norte and the Forest Land Classification Map from the community, the location of the Agata Limestone Project is classified as Timber Land-Production Forest. This type is defined as areas of forest lands that can be made available for timber and agroforestry production, range lands for grazing, and other forest lands special uses. In terms of the land and forest cover, the largest portion of the Project area is agricultural land planted with either annual or perennial crops.

B. Geology and Geomorphology

The Project site is largely underlain by the Cretaceous basement rocks of the Humandum Serpentinite and the Concepcion Greenschist. The former, believed to be a dismembered part of the Dinagat Ophiolite, is found in thrust contact with the latter and other metamorphic rocks. Humandum Serpentinite rocks include peridotite, pyroxenite, dunite, serpentinite and minor distribution of gabbro. On the other hand, Concepcion Greenschist is an interbedded metasedimentary and metavolcanic sequence. Within the metasedimentary succession are calcareous layers where the recrystallized limestone deposit is located.

There are several styles of mineralization that occur on the Agata property. These include Au oxide mineralization in saprolite that is developed over shallowly-buried intrusions, Cu and Au mineralization associated with quartz veinlet and pyritic stockworks along the margins of monzonitic to dioritic plutons, Au associated with horizons of disseminated pyrite in sooty carbonaceous limestones, and nickel mineralization generated by surficial zones of nickel enrichment in laterites that are developed on ultramafic protoliths.

The limestone deposit is compact and is situated in a single ridge located at Payongpayong area. This setting conveniently limits the excavated area within 52-hectares at most. The quarry will also have an additional 14.94-hectare buffer area around the 52-hectare excavation to allow for noise and vibration effects to be minimized, if not eliminated. The steep slopes at the Payongpayong ridge will be transformed into moderate, benched terrains that will be engineered to reduce susceptibility to landslides and erosions.

Geologic hazard assessments done for the Project area focused on six risk categories; tectonic characteristics, regional seismicity, fault ruptures, liquefaction potential, landslides and flood hazards.

Due to the location of the project area within a seismically active area, the risks associated with potential earth movement are the highest and of most concern.

The Project area is located within a seismically active region characterized by the close proximity of the Philippine Fault Zone. Consequently, the northern Mindanao region, including the Agusan and Surigao Provinces is susceptible to earthquake generated by the Philippine Trench and its related subduction zone structures, and by the Philippine Fault System and its associated structures. The western traces of the Lake Mainit Fault bound the eastern side of Malimono Ridge, making the area prone to strike-slip earthquakes.

The area around Malimono Ridge and the whole Agusan Valley has been host to a number of destructive earthquakes in the past. The proximity of the Philippine Fault to within a 2 km distance from the Project area presents a risk of a potentially large magnitude earthquake occurring in the future. The Philippine Trench is another source of earthquakes that would likely affect offshore Mindanao. When the epicenters move inland, these earthquakes tend to be of deeper hypo central depths due to the inclination of the subduction zone.

The rupture hazard may arise during large earthquakes, with the ground being displaced along the fault that causes the seismic event. The hazard of rupture therefore is centered, expected along the trace of the active fault. In the case of the Project area, this hazard can be sited on the trace of the Philippine Fault along the western edge of the valley located east of the Project site.

Landslides that may accompany intense seismic shaking can potentially occur along steep slopes, particularly in areas where thick soil or deposits of loose rocks may be present. This threat may also be present during intense rainfall events, when the soil is saturated with water, and when pore pressures from water percolating into the ground may render some areas unstable. Ground slopes within the Project area range from flat to greater than 50%. Based on the earthquake triggered landslide map from Mines and Geosciences Bureau (MGB), the Project site is moderate to highly susceptible to landslides.

Based on the same map from MGB, the prospect area is not considered as flood prone. However, the coastlines of Sitio Payong-payong were mapped to be prone to storm surges.

C. Pedology

Three (3) soil types and seven (7) soil mapping units were identified and mapped within the MPSA area. The three (3) soil types consisted of the Malalag clay loam, the Kabatohan sandy clay loam and the Umigan clay loam. Ground slopes within the Project area range from flat to greater than 50%. Both the Malalag and Kabatohan soil types can be found on slopes within this range. The Payongpayong limestone site is part of the Malalag Clay loam at 30-50% slopes and is considered an area with high susceptibility to erosion.

D. Terrestrial Ecology

Based on a Terrestrial Flora and Fauna Assessment conducted within the limestone quarry project site and within the adjacent watershed in Brgy. Tinigbasan, the Project area is generally characterized by three ecosystem types; forest over ultramafic rocks, tropical lowland evergreen rain forest and plantations. The ultramafic forest is the primary vegetation type with only a few tall and large trees. The tropical lowland evergreen forest is found in patches throughout the Project area and may be remnants of the vegetation that previously existed. The forest patches are generally found along the ridges and the streams/valleys within the Project area.

The assessment of plants recorded a total of 206 species belonging to 78 families and 145 genera. The most represented plant families were *Moraceae*, followed by *Arecaceae* and *Fabaceae* and, *Euphorbiaceae* and *Anacardiaceae*. When plants are grouped according to plant habit, results revealed

that trees and shrubs had the highest number of species among the group. A total of 150 individual trees consisting of 40 species were observed. *Vitex parviflora* (Tugas), *Adinandra robinsonii* (Sagimsim) and *Radermachera whitfordii* (Magasili) obtained the highest importance value in limestone site while in Tinigbasan watershed, *Artocarpus blancoi* (Antipolo), *Paraserianthes falcataria* (Falcata) and *Gmelina arborea* (Gmelina) dominated the area. In terms of important flora species, there were seven (7) vulnerable, eight (8) endangered and one (1) critically endangered species recorded.

The faunal environment within the survey area is also diverse, observed with a total of five (5) species of anurans, three (3) species of reptiles, 31 species of birds, and eight (8) species of mammals. Most of the species identified are categorized from least concern to near threatened.

E.3.2.2 Water Resources

A. Hydrology and Hydrogeology

The Agata Limestone Project is in the catchment of Payongpayong Creek and the road system towards project site, affecting the Tinagbasan Creek. The drainage basin is bound by a natural topographic and geologic divide which separate one drainage area or watershed from the other. The drainage basin supplies water to streams and their tributaries. Streams are classified based on consistency of flows, namely: perennial, intermittent and ephemeral stream.

The Municipality Tubay depend mainly on springs and creeks for their domestic water requirements. These water sources are typically located higher than the communities they serve. Concrete spring boxes and small dams are used to store the water while galvanized iron (GI), polyethylene (PE) and polyvinyl chloride (PVC) pipes connected to these structures convey the water by gravity to Level 2 and Level 3 water systems.

B. Oceanography

A localized bathymetric survey was done in the Payongpayong Port location prior to its construction in Year 2014**.** The bottom profile showed a gradual bathymetric change from the shore to the 250-meter length of the causeway. Beds of subtidal boulders or less rough textured rocks and/or large stones with growths of algae which cover the surface of the rock are a common feature of the first 20 meters offshore.

After this region is a fringing coral reef in poor to fair condition (20 to 130m away from shore with a depth range of 1.0 to 6.0m). Sandy substrates make up the remainder of the sea bottom (130 to 250 m away from the shore with a depth range of 6 to 18m). Much of its surface is covered by a very thin sheet of silt and mud. The deposited sediment is loosely packed and is highly re-suspendable with only little disturbance.

C. Water Quality

Water quality sampling and testing is performed internally by the Environment Department at 32 locations as part of the quarterly Multipartite Monitoring Team activity of the nickel project. Out of this water sampling stations, six stations are within the affected watershed of the Project. These locations include Downstream Payongpayong Creek, Tinigbasan Creek Confluence of Tributaries, Sitio

Payongpayong Water Source, Brgy. Tinigbasan Water Source, Payongpayong Coastal Area and the Tinigbasan Coastal Area.

Water quality monitoring activities include in-situ measurement of physical parameters such as pH, turbidity, and temperature. Laboratory analysis of chemical parameters include Nitrate, Phosphate, DO, Ammonia, Fluoride, surfactants, arsenic, cadmium, lead, iron, manganese, total suspended solids, oil and grease, BOD. The laboratory testing is done by accredited third party laboratories. Bacteriological testing is also done to determine fecal and total coliform levels.

Results of the surface water testing indicated general compliance with DAO 2016-08 for Class C water quality standards, except in upstream reforestation, Mantiwas Creek and in Midstream Kalinawan River, which showed high fecal coliform level above the 200 MPN/ 100 mL DAO 2016-08 standard. The baseline data collected for these stations in year 2012 already shown elevated coliform levels, which can be attributed to the human activities, natural decomposition process, and faunal manure deposits observed during the investigation conducted by the Environment Department. These stations of concern however, are not within the affected watershed of the project.

All parameters tested for drinking water sampling stations are within the prescribed standards of DAO 2016-08 and meet the AO 2010-010 “Philippine National Standard for Drinking Waters”, except for the exceedance detected for the fecal coliform in all sampling stations. The drinking water stations do not have any water treatment facility in place and is open to contamination. The community near the affected stream was informed of these findings. The concerned barangays have coordinated with the municipal government on the disinfection of the local water sources. In fact, barangay Tinigbasan have started using Reverse Osmosis facility to treat and provide clean drinking water to the community. Barangay Lawigan on the other hand, have a new water source but is not within the scope of the project.

All parameters tested for marine water showed compliance to applicable DAO 2016-08 Marine Water Quality standard.

D. Freshwater Ecology

The freshwater biological sampling within Payong-payong Creek and Tinigbasan Creek conducted in July 2020 recorded a total of 18 aquatic macroinvertebrates from 10 families. Majority of the organisms belong to *Phylum Arthropoda* which was largely dominated by the *Gerridae* family.

Water quality index (WQI) is also determined based on the presence of indicator species for sensitivity/tolerance to pollution. Comparison of WQI values between the two creeks studied indicated better WQI in Payongpayong Creek, which is based on its WQI value, can be categorized under *very clean water.* This is compared to Tinigbasan Creek which fall within the *rather clean- clean water* range.

E. Marine Ecology

The latest third-party coral monitoring survey conducted in May 2019 within the vicinity of the Payong-payong Port area and the coral relocation site in Tinigbasan Sanctuary indicated a relatively good to fair coral cover. Lateritic soil was not observed on the rocky and sandy bottom of the nearshore shallow reef, south of the pier facility. The encrusting or foliate coral *Pavona decussata* and the massive/ sub-massive *Porites spp* were the most predominant form in the reef area. Individual colonies of these coral species are still very much intact and in an apparent healthy condition with normal coloration and pigmentation.

The corals within the study area are being threatened by both natural and human-induced disturbances. Potential source of stresses and disturbances that were identified during the monitoring period included

turbidity and siltation, accidental bumping of corals by tugboats and barges, infestation of crown-of-thorns starfish *Acanthaster planci* and storm damage.

The survey also looked at the reef fish communities. A total of 140 species belonging to 31 families, with were recorded at the sampling stations. The damselfishes (*Pomacentridae*) are observed as the dominant species in the coral reefs.

Visual census of macroinvertebrates while scuba diving recorded a total of 19 macroinvertebrate species/taxa that are classified under seven (7) major faunal groups. The tiny reef ascidian C*lavelina sp.* and the green ascidian/sea squirt *Didemnum sp.* were the most common and abundant macroinvertebrates found in the study area. This was followed by the blue starfish *Linckia laevigata*, and the ink-spot sea squirt/ascidian *Polycarpa aurata.*

E.3.2.3 Air Resources, Noise, and Climate

A. Meteorology and Climatology

The Project area is located within a Type II climate zone as defined by the Modified Coronas Climate Classification developed by the Philippines Atmospheric, Geophysical and Astronomical Services Administration (PAGASA). This particular climate type is characterized by an absence of a dry season. Rainfall occurs throughout the year with the heaviest rainfall occurring during the months of December and January.

The mean annual rainfall (1981-2010) at the PAGASA-Butuan Station is 2,058 mm with the period of October to February being the wettest months. The company maintains its own rain gauges and are installed at the nickel mine area and another one at the port area in Payong-payong. The mean annual rainfall recorded at the surface mine site for the five-year period record is 204.66 mm. A slightly lower precipitation trend was observed at the Payongpayong Port area with annual mean rainfall of 139.79 mm. In both stations, January was observed as the wettest month, while April and May were the driest months.

The temperature records of the PAGASA Butuan City Station indicate a relatively warm annual average temperature of 32.2°C(max), 23.4°C(min) and an annual mean of 27.8°C. May, June and August are the hottest months, while January is the coldest.

B. Air and Noise Quality

Third party monitoring of ambient air and noise were conducted by Berkman Systems Inc. as part of the quarterly monitoring for ANLP. Included among the stations monitored are the Payong-payong area and at the Brgy. Tinigbasan community which are both covered within the identified impact area for the ALP. Results for both stations indicated that the TSP and PM-10 levels detected are in compliance to the applicable ambient air standards. Morning noise level at the station in Brgy. Tinigbasan slightly exceeded the noise standard which can be attributed to its location being near a population center.

E.3.2.3 People

A. Community Profile

The impact area where Project activities will be implemented is in Brgy. Tinigbasan, Municipality of Tubay. The neighboring community that hosts the support facilities is Brgy. of Lawigan, also within the municipal jurisdiction of Tubay. Each barangay has a population of around 1,000 individuals and each with nearly 200 households. The majority of the local inhabitants within and surrounding the Project area are of Visayan heritage. The area is also the home of the Mamanwa-Manobo indigenous peoples.

In most recent times migrants from the Visayas and Luzon Province s have settled in the area due to the economic opportunities brought about by the current mining operations.

In terms of educational attainment, only a small percentage of the population was able to complete tertiary education, around 5%-6% in both impact barangays. More than a third of the population at least attended primary schooling.

The two (2) mining impact barangay are located along the coastline. For this reason, a good number of families depend on fishing as their major source of income. Barangays Tinigbasan and Lawigan has an average production of 17.1 tonnes of fish per year. Livestock raising is also practiced. The current nickel mining operations is also one of the big employers for labor workers.

Leading causes of mortality among the impact communities vary across municipalities. In Barangays Lawigan and Tinigbasan, they are infection, pneumonia, hypertension, tuberculosis, and acute gastroenteritis. There are health care facility and health care workers catering to the health care needs of the community.

All households of the two (2) impact barangays have access to toilets and safe drinking water. Most of the water are distributed via a Level II water system of communal source for 2-3 household units. All barangays of Municipality of Tubay are adequately served with power supply, mainly provided by the Agusan del Norte Electric Cooperative (ANECO). Communication services is provided through six (6) cellular sites present in the Tubay municipality.

B. Perception Survey

The Community Relations Office commissioned a group of researchers to conduct a Project Perception Survey to assess the social acceptability of the proposed development and operation of ALP. A total of 192 residents from the two impact barangays responded to the survey conducted in February 2020.

More than half or 71% of the participants expressed positive acceptance for an extended mining operation through the Agata Limestone Project. Positive response was accounted from both of the barangays. The most direct reason given by the participants for favoring the extension is the economic opportunities from the mining industry.

Most of the survey respondents agreed to the idea that there will be an overall improvement if the mining activity will continue to operate in the area. Majority cited improvement in education through the company's educational assistance program. Other perceived benefits cited are API's contribution to the local disaster risk reduction and response management, livelihood opportunities, and health benefits.

Respondents who answered no expressed their apprehensions on the possible risks that could be aggravated by mining activities particularly on the environment, health, and geological aspect. Some also noted that they don't think the project will provide them with employment opportunities.

E.3.3 Summary of Key Impacts and Environmental Management Plan

A summary of the key impacts and management plan of API for the Construction and Development Phase, Operations Phase and Abandonment Phase of the Project is summarized **Table E-13.**

Table E-13 Summary of Impact Management Plan

Potential Impacts	Project Phase/ Activity	Management Plan for Prevention, Mitigation and Enhancement	Target Efficiency
1. Change in surface landform, topography, terrain and slope.	1. Site Preparation Clearing, and Earthwork. 2. Construction of Additional Roads. 3. Pre stripping activities at the quarry site. 4. Clearing and Grubbing 5. Ore Extraction, Loading, and Hauling	• Engineering design to prevent slope failure. • Proper benching. • Establishment of proper drainage to prevent erosion and scouring. • Reshaping and recontouring of mined out areas. • Application of Thematic landscaping in the progressive rehabilitation of improve the aesthetic view of the modified land form. • Topsoil conservation, storage, and management. • There is no overburden to strip, however, any incidental topsoil would be removed and stockpiled for future use.	• Mine Design Criteria: o Bench Height - 25m o Berm Width (Safety Catchment) - 5m o Overall Slope Angle - 60 Degree • Accomplish at least 90% of the quarterly rehabilitation target following contour planting and thematic landscaping design. • At least 60% of the Removed Topsoil will be stored for future Utilization.
	6. Construction of Crushing Plant and other Facilities.	• Limited clearing and earth movement according to the approved Mine Development Plan; phasing of activities (if possible).	• At least 90% Completion of Structure Construction Within 6 Months. • Limit disturbance to not more than 60 ha during Quarry Operations. • Plant design and specifications will be thorough prior to actual construction and commissioning. The design of the plant and other facilities will be subject to required review and approval of the regulators (DENR) prior to construction and operation.
	7. Drilling	• Contract an Accredit Third Party Contractor to Conduct Drilling Activity. • Follow the prescribed drilling specifications.	• Drilling Parameters: o Bench height 5 m o Drill depth 5.8 m o Hole diameter 89.00 mm o Burden 3.60 m o Spacing 4.20 m o Sub-drill 0.80 m o Stem height 2.70 m o Charge length 2.30 m o Ratio of HE to LE 20% to 30%

Potential Impacts	Project Phase/ Activity	Management Plan for Prevention, Mitigation and Enhancement	Target Efficiency
1. Change in surface landform, topography, terrain and slope.	8. Blasting	• Contract an Accredited Third Party to Conduct Drilling and Blasting Activity • Follow the prescribed blasting specifications. • Implementation of controlled blasting techniques such as single hole firing, trim blast, and pre-splits.	• Blasting Parameters: o Ammonium Nitrate with Fuel Oil (ANFO) o Cast Primer 250 gms o NONEL Surface Connector x 6 metres o In-hole delay, 500ms x 12 metres o Detonating Cords, 6 grams Cast Primer 250 gms o NONEL Surface Connector x 6 metres o In-hole delay, 500ms x 12 metres o Detonating Cords, 6 grams
	1. Structure Decommissioning 2. Rehabilitation of Mine Disturbed Areas	• Follow safety bench and slope parameters in post mining landform. • Follow contour planting and thematic landscaping.	• Design Parameters for Safety of Slopes: o Bench Height: 25 m o Berm Width (Safety Catchment): 5m o Overall Slope Angle: 45 degrees • Accomplish at least 90% of the quarterly rehabilitation target following contour planting design.
2. Loss of vegetation, topsoil, and exposure of soil materials	1. Site Preparation Clearing and Earthwork 2. Pre stripping activities at the quarry site. 3. Construction of Additional Roads 4. Construction of Crushing Plant and other facilities. 5. Clearing and Grubbing 6. Ore Extraction, Loading and Hauling	• Limited clearing and earth movement according to the approved Mine Development Plan; phasing of activities (if possible). • Earth balling and transplanting of viable regenerations. • Establishment of forest reserve pockets or buffer zone within the influence area where native species are preserved.	• At least 90% Completion of Structure Construction Within 6 Months. • Limit disturbance to not more than 60 ha during Quarry Operations. • Plant design and specifications will be thorough prior to actual construction and commissioning. The design of the plant and other facilities will be subject to required review and approval of the regulators (DENR) prior to construction and operation. • Recover at least 10% representatives of each species to be removed. • Establish at least 1-hectare forest reserve within the project site.

Potential Impacts	Project Phase/ Activity	Management Plan for Prevention, Mitigation and Enhancement	Target Efficiency
		• Application of high-quality seedling propagation such non mist cloning and bioremediation.	• Produce at least 30% of the total seedling requirement for reforestation.
		• Application of soil erosion control such installation of fascines and wattling and plantation hedgerows along the slope.	• Establish 50% slope stabilization measures within the covered area.
		• Topsoil conservation, storage, and management.	• Recover at least 80% of the topsoil cover for rehabilitation.
3. Disturbance of Flora and Fauna: Loss of terrestrial biodiversity	1. Site Preparation Clearing, and Earthwork 2. Construction of Additional Roads 3. Construction of Crushing Plant and other Facilities. 4. Pre stripping activities at the quarry site. 5. Clearing and Grubbing	• Provision of Buffer Zones.	• Maintenance of buffer zone of at least 25 meters away from project periphery. • Establish at least 1-hectare forest reserve within the project site. • Develop / Enhance a forest land in adjacent buffer zone to recreate an ecological balance.
		• Collection of wildlings prior to vegetation clearing for endemic plant species preservation.	• Collect at least 10% representative of each specie type per mine parcel • Establish a minimum of 1 nursery and/or satellite nursery in support of the reforestation program.
		• Landscaping and revegetation activities.	• Accomplish at least 90% of the quarterly rehabilitation target following contour planting and thematic landscaping design.
		• Replace all affected vegetation with diverse vegetative species to contribute a stable and compatible ecosystem in the progressive rehabilitation program.	• Planting of at least 80% native or indigenous species.
		• Regular Flora and Fauna Monitoring.	• 100% Conduct Semi-Annual Flora and Fauna Monitoring to be conducted every April (50%) and November (50%).

Potential Impacts	Project Phase/ Activity	Management Plan for Prevention, Mitigation and Enhancement	Target Efficiency
4. Disturbance of Flora and Fauna: Faunal migration due to noise	1. Site Preparation Clearing, and Earthwork 2. Construction of Additional Roads 3. Construction of Crushing Plant and other Facilities. 4. Pre stripping activities at the quarry site 5. Clearing and Grubbing	• Provision of Buffer Zones. • Establishment of vegetation along roads as ecological curtain. • Planting of faunal feeding tree species to attract fast regeneration of disturbed faunal species. • Periodic conduct of air and noise monitoring. • Periodic conduct of Terrestrial Flora and Faunal Inventory.	• Maintenance of buffer zone of at least 25 meters away from project periphery. • 100% planting of trees along the road. • Planting at least 80% indigenous and bird feeding species. • 100% Conduct of Air and Noise Sampling. Air and Noise Quality Sampling (Quarterly) to be conducted in March (25%), June (25%), September (25%), December (25%) • 100% Conduct Semi-Annual Flora and Fauna Monitoring to be conducted every April (50%) and November (50%).
	6. Ore Extraction, Loading, and Hauling 7. Stockpiling 8. Crushing Plant Operation Port Operations (Barging and Shipping) 9. Drilling 10. Blasting 11. Structure Decommissioning 12. Rehabilitation of Mine Disturbed Areas	• Application of noise control device in all machineries. • Implementation of the Standard Operating Procedure that include minimization of noise from operation. • Establishment of vegetation along roads as ecological curtain to minimize noise. • Planting of faunal feeding tree species to attract fast-regeneration of disturbed faunal species in declared mined out areas or disturbed areas subject for progressive rehabilitation. • Periodic conduct of air and noise monitoring.	• 100% installation of noise control device in all machineries. • Controlled Blasting will be done Once a Week • 100% planting of trees along the road. • Planting at least 80% indigenous and bird feeding species. • 100% Conduct of Air and Noise Sampling. Air and Noise Quality Sampling (Quarterly) to be conducted in March (25%), June (25%), September (25%), December (25%)

Potential Impacts	Project Phase/ Activity	Management Plan for Prevention, Mitigation and Enhancement	Target Efficiency
		• Periodic conduct of Terrestrial Flora and Faunal Inventory.	• 100% Conduct Semi-Annual Flora and Fauna Monitoring to be conducted every April (50%) and November (50%).
5. Increased soil erosion from exposed soil surface.	1. Site Preparation Clearing, and Earthwork. 2. Pre stripping activities at the quarry site. 3. Construction of Additional Roads. 4. Clearing and Grubbing 5. Ore Extraction, Loading, and Hauling 6. Structure Decommissioning 7. Rehabilitation of Mine Disturbed Areas	• Follow Mine Design Parameters/Criteria to Maintain Safety Slope and Minimize soil erosion. • Installation of erosion control materials (i.e. coconets, gabion basket, stop logs, wattlings, and fascines) to provide slope stability. • Progressive Rehabilitation of inactive disturbed areas by area stabilization and vegetative cover placement (as applicable).	• Mine Design Criteria: o Bench Height - 25m o Berm Width (Safety Catchment) - 5m o Overall Slope Angle - 60 Degree • Maintain slope not more than 70 Degrees. • 50% coverage of slope stabilization measures within the covered area. • Quarterly Installation of erosion control measures To be conducted in March (25%), June (25%), September (25%), December (25%). • 100% Turn-over of Mined out Areas to MEPEO for Final Revegetation every end of the Quarter. Area with mineable ore will be temporarily revegetated.
6. Face/ slope instability resulting to landslides.	1. Site Preparation Clearing, and Earthwork 2. Pre stripping activities at the quarry site 3. Construction of Additional Roads	• Design slope with correct elevation and level of benches for land stability	• Maintain slope not more than 70 Degrees. • 100% Implementation of a Final Mine Rehabilitation and Decommissioning Plan (FMRDP).
7. Reduced soil fertility	1. Site Preparation Clearing, and Earthwork 2. Pre stripping activities at the quarry site 3. Construction of Additional Roads 4. Clearing and Grubbing 5. Ore Extraction, Loading, and Hauling	• Topsoil conservation, storage, and management to preserve soil fertility. • Amelioration and conditioning of soil during revegetation. • Regular soil quality testing.	• Remove Less than 1m topsoil during extraction (Only during first phase of Extraction, No more topsoil as the Quarry Progresses) • Restore at least 80% of the initial Soil Quality prior to mining. • Quarterly application soil amelioration. To be conducted in March (25%), June (25%), September (25%), December (25%). • 100% planting of leguminous or nitrogen fixing plants in mined out /disturbed areas.

Potential Impacts	Project Phase/ Activity	Management Plan for Prevention, Mitigation and Enhancement	Target Efficiency
		• Implementation of Sloping Agricultural Land Technology along steep slopes to prevent erosion such as contour planting using leguminous hedgerows and other nitrogen fixing plants to enhance the fertility of the soil like kakawate, flemengia, rensonii, arakish pentoii etc.	• Conduct 4 (100%) soil quality testing annually. To be conducted on: March (25%), June (25%), September (25%), December (25%).
8. Land contamination due to potential leaks or spills of oils and fuels from equipment use.	1. Site Preparation Clearing, and Earthwork. 2. Pre stripping activities at the quarry site. 3. Construction of Additional Roads. 4. Ore Extraction, Loading, and Hauling 5. Stockpiling 6. Structure Decommissioning	• Strict implementation of the Hazardous materials storage and handling. • Provision of secondary containment with a capacity of 110% greater than the volume of contained liquid. • Requiring of Spill Kit in heavy equipment. • Regular spill drills to train employees and contractors of proper spill management. • Implementation of Soil Remediation program (as necessary) prior to Revegetation.	• 100% Availability of Spill Kits and secondary containment. • Weekly Inspection of Contractors' Area and Heavy Equipment. Checking for compliance Envi & Safety Requirement. (Spill Kits, PPEs, Fire Extinguishers). • Routine spill drill and IEC for employees and contractors every quarter.
9. Land contamination from solid and hazardous waste generation from domestic, office, and industrial activities.	1. Site Preparation Clearing, and Earthwork. 2. Pre stripping activities at the quarry site. 3. Construction of Additional Roads 4. Construction of Crushing Plant and other Facilities 5. Ore Extraction, Loading, and Hauling 6. Crushing Plant Operation 7. Vehicle operation (transportation of goods and people)	• Implementation of Solid Waste Management Program • Good Housekeeping • Implementation of Hazardous Waste Management Program.	• 100% Establishment of a Solid Waste Facility. • 100% completion of its target for Daily collection of Garbage Establish Material Recovery Facility • No more than 10% increase Housekeeping non-conformance every internal audit • Recycling of at least 20% of the monthly generated solid waste. • 100% Establishment of a Hazardous Waste Facility

Potential Impacts	Project Phase/ Activity	Management Plan for Prevention, Mitigation and Enhancement	Target Efficiency
	8. Daily office and housing facility operations 9. Structure Decommissioning 10. Rehabilitation of Mine Disturbed Areas		
10. Tenurial/ Land Use Issues with the CBFMA holders	1. Site Preparation Clearing, and Earthwork 2. Construction of Additional Roads 3. Ore Extraction, Loading, and Hauling	• Execution of MOA on temporary relinquishment of overlapping areas. • Partnership with local Peoples Organization to improve the CBFMA areas outside the areas of overlap.	100% Progressive rehabilitation of target disturbed areas thru tree planting and re-vegetation at mine-out areas to achieve the post mining land-use
11. Inconsistency of the Post Mining Land Use Plan with the CLUP of the LGU/ Land Use of the CBFM	1. Rehabilitation of Mine Disturbed Areas 2. Final Turnover of Project Facilities	• Consultation with Project stakeholders during the periodic review of FMRDP re Post Mining Land Use concept	• FMRDP consultation planning every 2 years. • 100% Implementation of a Final Mine Rehabilitation and Decommissioning Plan (FMRDP) according to Post Mining Land Use agreed with the stakeholders.
12. Exposure of Decommissioned Structures (Aesthetic Value)	1. Structure Decommissioning	• Revegetation of barren areas after decommissioning of structure.	• 100% Implementation of a Final Mine Rehabilitation and Decommissioning Plan (FMRDP).
13. Water Quality Degradation: Sedimentation and siltation in local rivers,creeks, and marine water due to local erosion, dust generation from disturbed areas, and accidental ore spillage from loading to conveyor belt transport to loading facility.	1. Site Preparation Clearing, and Earthwork 2. Construction of Additional Roads 3. Construction of Crushing Plant and other Facilities. 4. Pre stripping activities at the quarry site 5. Clearing and Grubbing 6. Ore Extraction, Loading, and Hauling 7. Stockpiling 8. Structure Decommissioning 9. Rehabilitation of Mine Disturbed Areas	• Provision of Buffer Zones • Proper Planning and Establishment of proper drainage system around active disturbed areas for runoff management: o Road berms and interceptor canals o Peripheral drains around the mines, stockpiles, and waste dumps.	• Buffer zone of at least of >25m between the Areas of Disturbance and Rivers and Creeks. • Limit disturbance to not more than 60 ha during Quarry Operations. • 100% completion on the construction of water management structures as designed or planned in the EPEP.

Potential Impacts	Project Phase/ Activity	Management Plan for Prevention, Mitigation and Enhancement	Target Efficiency
		• Installation of erosion control materials along slopes (coconets, gabion basket, stop logs, wattlings, and fascines).	• 50% coverage of slope stabilization measures within the covered area.
		• Installation of silt curtain along the near shore water to capture silt/ sediment materials discharged in the ocean.	• 100% Installation of silt curtain and other filtration process in water discharge points
		• Conduct periodic maintenance of the water management structures.	• 100% completion of regular de-silting of catchment basins (Weekly and or Every after rains)Weekly inspection of settling ponds and drainage system evaluation.
		• Conduct Period monitoring on the stability and efficacy of the water management structures.	• 100% Conduct of Quarterly Water Quality Sampling and Monitoring to be conducted in March (25%), June (25%), September (25%) December (25%).
		• Conduct of Quarterly Ambient Water Quality Monitoring, Evaluation and Analysis.	• 100% Conduct of Quarterly Water Quality Sampling and Monitoring to be conducted in March (25%), June (25%), September (25%) December (25%).
		• Diversion water run-off from hills away from the active mining areas and waste dumps for low quality limestones and fines raised at 10-meter lifts	
		• Construction of water retention/ treatment facilities (silt/ sediment ponds) at catchment areas for sediment removal prior to discharge of the clear water to the local streams.	
		• Conveyor belt facility to be equipped with catchment system for ore spillage.	
		• Regular collection of spilled materials as part of site maintenance activities.	
		• Regular Water Quality Monitoring.	

Potential Impacts	Project Phase/ Activity	Management Plan for Prevention, Mitigation and Enhancement	Target Efficiency
14. Water Quality Degradation: Siltation of near shore environment due ore spillage during ore loading activities.	1. Port Operations (Barging, Shipping) 2. Ore stockpiling	• Installation of silt curtain at the periphery of the port to capture silt/ ore spillage. • Provision of ore spill raft as catchment during loading. • Regular Marine Water Quality Monitoring	• 100% Provision of Ore Spill Raft, at least 1 Raft Per Barge/LCT • 100% conduct of Quarterly Marine water quality monitoring to be conducted in March (25%), June (25%), September (25%), December (25%)
15. Water Quality Degradation: Water contamination from accidental spillage of fuel and chemicals from daily operational activities.	1. Ore Extraction, Loading, and Hauling 2. Crushing Plant Operation 3. Stockpiling 4. Port Operations (Barging, Shipping) 5. Vehicle operation (transportation of goods and people)	• Chemical and Fuel Storage areas equipped with spill kits and secondary containment. • Proper handling and storage of Hazardous Wastes. • Regular spill drills to train employees and contractors of proper spill management. • Hazardous waste disposal and treatment by DENR accredited facilities.	• 100% Availability of Spill Kits. • Weekly Inspection of Fuel and Chemical Storage Building Checking for compliance Envi & Safety Requirement. (Spill Kits, PPEs, Fire Extinguishers). • Routine spill drill and IEC for employees and contractors every quarter. • Schedule disposal upon reaching 80% of the Hazardous Waste Storage Facility capacity.
16. Water Quality Degradation: Nutrient influx from contaminated domestic wastewater.	1. Port Operations (Barging, Shipping) 2. Daily office and housing facility operations.	• Regulate barges and conduct IEC on Barge and Vessel Crew Regarding Company Policies on proper wastewater management. • Construction of septic tanks in all office buildings and accommodation buildings for domestic wastewater treatment prior to discharge. • Regular Water Quality Monitoring	• Barge Inspection every month. • Routine IEC for barge personnel/ contractors every quarter. • Zero discharge of untreated domestic wastewater. • 100% Conduct of Water Quality Sampling and Monitoring to be conducted in March (25%), June (25%), September (25%), December (25%).
17. Water Quality Degradation: Water run-off contamination due to contact with exposed rocks and loose sediments.	1. Site Preparation Clearing, and Earthwork 2. Construction of Additional Roads 3. Construction of Crushing Plant and other Facilities.	• Establishment of Buffer Zone. • Limited clearing and earth movement according to the approved Site Development Plan.	• Buffer zone of at least of >25m between the Areas of Disturbance and Rivers and Creeks. • Limit disturbance to not more than 60 ha during Quarry Operations.

Potential Impacts	Project Phase/ Activity	Management Plan for Prevention, Mitigation and Enhancement	Target Efficiency
	4. Pre stripping activities at the quarry site 5. Clearing and Grubbing 6. Ore Extraction, Loading, and Hauling Stockpiling	• Establishment of proper drainage system around active disturbed areas for runoff management: o Road berms and interceptor canals o Peripheral drains around the mines, stockpiles, and waste dumps. • Construction of water retention/ treatment facilities (silt/ sediment ponds) at catchment areas for sediment removal and chemical degradation prior to discharge of the clear water to the local streams. • Regular Water Quality Monitoring	• Weekly Drainage System Inspection. • Installation and maintenance of 5-10 Settling ponds before final discharge. • 100% Conduct of Quarterly Water Quality Sampling and Monitoring to be conducted in March (25%), June (25%), September (25%) December (25%).
18. Water Quality Degradation: Recharge of contaminated water in shallow aquifers	Ore Extraction, Loading, and Hauling	• Establishment of drainage system (road berms, interceptor canals) around active disturbed areas for runoff management. • Regular Water Quality Monitoring • Water Conservation Measures.	• 100% Conduct of Water Quality Sampling and Monitoring to be conducted in March (25%), June (25%), September (25%), December (25%).
19. Threat to Freshwater and Marine Ecology: o Freshwater Habitat and Marine Habitat degradation from poor water quality (silt deposition and discharge of poor quality run-off/discharge) o Impediment in the natural biological processes of freshwater/ marine organisms due to presence of contaminants.	1. Construction of Crushing Plant and other Facilities. 2. Pre stripping activities at the quarry site 3. Clearing and Grubbing 4. Ore Extraction, Loading, and Hauling 5. Stockpiling 6. Crushing 7. Port Operations (Barging and Shipping)	• Installation of sediment control materials (i.e silt traps, gabions, silt fence, wattlings, etc.) along waterways to prevent flow of silt and contaminants to natural water bodies. • Regular Water Quality Monitoring Installation of silt curtain along the near shore water to capture silt/ sediment materials discharged in the ocean. • Provision of drainage system and water management structure at the periphery of the disturbed area.	• Installation and maintenance of 5-10 Settling ponds before final discharge. • 100% Conduct of inspection on settling ponds on a weekly basis. • 100% Conduct of Water Quality Sampling and Monitoring to be conducted in March (25%), June (25%), September (25%), December (25%). • 100% establishment of periphery canal along disturbed areas diverting all silt laden run off to the established water management structures.

Potential Impacts	Project Phase/ Activity	Management Plan for Prevention, Mitigation and Enhancement	Target Efficiency
		• Construction of water retention/ treatment facilities (silt/ sediment ponds) at catchment areas. • Regular maintenance of the drainage and water management facilities. • Provision of ore spill raft as catchment during loading. • Regulate barges and conduct IEC on Barge and Vessel Crew Regarding Company Policies on Water Resource Management. • Regular Freshwater and Marine Habitat Monitoring. • Regular Water Quality Monitoring	• 100% implementation of the target maintenance activities per quarter. • 100% operation water raft per barge. • Conduct of IEC Campaign once a week or Weekly Sea based Contractors Meeting to monitor contractors Performance and Environmental Measures. • 100% Conduct of Semi-Annual Marine Ecology Assessment conducted every July (50%), January (50%). • 100% Conduct of Freshwater Ecology Assessment conducted every year. • 100% Conduct of Water Quality Sampling and Monitoring to be conducted in March (25%), June (25%), September (25%), December (25%).
20. Human health impacts from water contamination	1. Construction of Crushing Plant and other Facilities. 2. Pre stripping activities at the quarry site 3. Clearing and Grubbing 4. Construction of Crushing Plant and other Facilities. 5. Pre stripping activities at the quarry site 6. Clearing and Grubbing 7. Ore Extraction, Loading, and Hauling 8. Stockpiling 9. Crushing Port Operations (Barging and Shipping)	• Provision of drinking water to employees to prevent tapping from untreated sources. • Separate water sources for project activities and community use. • Installation of Reverse Osmosis for water supply at the Camp facilities. • IEC on the water quality monitoring results to the community.	• 100% Conduct of Water Quality Sampling and Monitoring to be conducted in March (25%), June (25%), September (25%), December (25%). • Conduct of Quarterly IEC re: Water Quality Monitoring Results. • 100% Conduct of Water Quality Sampling and Monitoring to be conducted in March (25%), June (25%), September (25%), December (25%).

Potential Impacts	Project Phase/ Activity	Management Plan for Prevention, Mitigation and Enhancement	Target Efficiency
		• Health programs under SDMP. • Regular water quality Monitoring	• Less than 3 cases of morbidity cases related to water borne illness among employees every month. • Implementation of quarterly medical missions and other health programs through the SDMP.
21. Water supply competition	1. Construction of Crushing Plant and other Facilities. 2. Pre stripping activities at the quarry site 3. Clearing and Grubbing 4. Ore Extraction, Loading, and Hauling 5. Stockpiling 6. Crushing 7. Port Operations (Barging and Shipping) 8. Water spraying for dust suppression 9. Daily office and housing facility operations	• Water sources separate from community water source. • Conditional Water Rights is secured from NWRB • Regular Flow Rate Measurement and Monitoring • Implementation of Water Conservation Measures such as recycling of water from the settling ponds to be used for plant watering and dust suppression. • Minimization on the use of water for domestic purposes. And harvesting of rainwater.	• 100% compliance to the conditions of Water Rights Permit from NWRB. • 100% conduct of quarterly flow rate monitoring on the identified water sources. • Recycle at least 10% of used water from the domestic. • At least 90% recycling of the run-off water contained in the settling ponds.
22. Potential downstream flooding due to high flow velocities and peak discharges during rainfall events.	1. Site Preparation Clearing, and Earthwork 2. Construction of Additional Roads 3. Construction of Crushing Plant and other Facilities. 4. Pre stripping activities at the quarry site 5. Clearing and Grubbing Ore Extraction, Loading, and Hauling	• Hydrology and Discharge Monitoring • Construction of drainage control facilities for stormwater management. • Installation of sediment ponds acting as water retention ponds to attenuate flow.	• Quarterly discharge monitoring. • Daily meteorology monitoring. • 100% Conduct of inspection on settling ponds on a weekly basis. • 100% completion of regular de-silting of catchment basins (Weekly and or Every after rains)
23. Reduced infiltration and water holding capacity of the affected watershed.	1. Site Preparation Clearing, and Earthwork 2. Construction of Additional Roads 3. Construction of Crushing Plant and other Facilities. 4. Pre stripping activities at the quarry site 5. Clearing and Grubbing	• Limited clearing and earth movement according to the approved Mine Development Plan; phasing of activities (if possible).	• Disturbed not more than 60ha during Quarry operations.

Potential Impacts	Project Phase/ Activity	Management Plan for Prevention, Mitigation and Enhancement	Target Efficiency
	6. Ore Extraction, Loading, and Hauling	• Progressive Rehabilitation of inactive disturbed areas by area stabilization and vegetative cover placement (as applicable).	• Quarterly turnover of Mined out Areas for Progressive Rehabilitation. • 100% completion of the quarterly target for area revegetation.
24. Change in current pattern and littoral drifts due to alteration of wave refraction	1. Port Operations (Barging, Shipping)	• Careful site selection of Port location considering the discharge flow of creeks. • Regular Marine Ecology Monitoring Regular Marine Water Quality Monitoring	• 100% conduct of Annual Coral and Marine Habitat monitoring • 100% conduct of Quarterly Marine Water Quality Monitoring to be conducted in March (25%), June (25%), September (25%), December (25%)
25. Erosion of shorelines	1. Port Operations (Barging, Shipping)	• Installation of gabion baskets to serve as sea wall to prevent erosion. • Covering of tarpaulin at the causeway head during high swell or bad weather condition to prevent causeway material from eroding. • Suspension of loading and docking of barges during bad weather condition.	• 100% implementation of seawall. • Weekly Causeway Inspection. • 100% covering of tarpaulin at the causeway head during bad weather condition
26. Dust Generation from Equipment Operation	1. Site Preparation Clearing, and Earthwork 2. Construction of Additional Roads 3. Construction of Crushing Plant and other Facilities. 4. Pre stripping activities at the quarry site 5. Clearing and Grubbing 6. Ore Extraction, Loading, and Hauling 7. Stockpiling 8. Port Operations (Barging and Shipping) 9. Structure Decommissioning Rehabilitation of Mine Disturbed Areas	• Provision of Buffer Zones from mine area to the nearest community. • Deployment of Water Trucks for Dust Suppression Regular Ambient Air Monitoring	• Buffer zone of at least of >25m around the periphery of the disturbed area. • Deployment of Water trucks for Dust Suppression. 1 Water Trucks will at least have 5 Trips Per Shift with a total of at least 10 Water Trucks Daily. 50 Trips Daily. 100% Conduct of Ambient Air Quality Sampling (Quarterly) to be conducted in March (25%), June (25%), September (25%), December (25%)

Potential Impacts	Project Phase/ Activity	Management Plan for Prevention, Mitigation and Enhancement	Target Efficiency
27. Dust generation from vehicle and heavy equipment movement	1. Site Preparation Clearing, and Earthwork 2. Construction of Additional Roads 3. Construction of Crushing Plant and other Facilities. 4. Pre stripping activities at the quarry site 5. Clearing and Grubbing 6. Ore Extraction, Loading, and Hauling 7. Stockpiling 8. Vehicle operation (transportation of goods and people) 9. Structure Decommissioning 10. Rehabilitation of Mine Disturbed Areas	• Water truck deployment • Speed limit regulation • Regular Ambient Air Monitoring	• Deployment of Water trucks for Dust Suppression. 1 Water Trucks will at least have 5 Trips Per Shift with a total of at least 10 Water Trucks Daily. 50 Trips Daily. • Speed limit set at 20 kph for mobile vehicles and 15 kph for dump trucks and other heavy equipment. • 100% Conduct of Ambient Air Quality Sampling (Quarterly) to be conducted in March (25%), June (25%), September (25%), December (25%)
28. Dust generation from Stockpiles	1. Stockpiling	• Covering stockpiles to prevent dust and fines from blowing • Set the stockpile Location with Natural Wind Barrier (vegetation as ecological curtain) • Regular Water Spraying at the stockpile area.	• Full cover of stockpile with tarpaulin material. • 100% Water Spraying Every Day.
29. Health Impacts from Dust Generation: o Stunted growth of plants due to dust deposition. Health Impacts from dust inhalation	1. Site Preparation Clearing, and Earthwork 2. Construction of Additional Roads 3. Construction of Crushing Plant and other Facilities. 4. Pre stripping activities at the quarry site 5. Clearing and Grubbing 6. Ore Extraction, Loading, and Hauling 7. Stockpiling 8. Vehicle operation (transportation of goods and people) 9. Port Operations (Barging and Shipping 10. Structure Decommissioning	• Deployment of Water Trucks for Dust Suppression • Provision of PPEs to employees directly working at the active areas. • Health programs under SDMP (i.e. free medical assistance for the community) • Regular road maintenance • Set the stockpile Location with Natural Wind Barrier	• Deployment of Water trucks for Dust Suppression. 1 Water Trucks will at least have 5 Trips Per Shift with a total of at least 10 Water Trucks Daily. 50 Trips Daily. • 100% Provision of Personal Protective Equipment • Implementation of quarterly medical missions and other health programs through the SDMP.

Potential Impacts	Project Phase/ Activity	Management Plan for Prevention, Mitigation and Enhancement	Target Efficiency
	11. Rehabilitation of Mine Disturbed Areas.	• Enforce appropriate speed limit to vehicular movement. • Regular Ambient Air Monitoring.	• Speed limit set at 20 kph for mobile vehicles and 15 kph for dump trucks and other heavy equipment. • 100% Conduct of Ambient Air Quality Sampling (Quarterly) to be conducted in March (25%), June (25%), September (25%), December (25%).
30. Chemical emissions from fuel combustion/ equipment use	1. Site Preparation Clearing, and Earthwork 2. Construction of Additional Roads 3. Construction of Crushing Plant and other Facilities. 4. Pre stripping activities at the quarry site 5. Clearing and Grubbing 6. Ore Extraction, Loading, and Hauling 7. Stockpiling 8. Vehicle operation (transportation of goods and people) 9. Port Operations (Barging and Shipping) 10. Structure Decommissioning 11. Rehabilitation of Mine Disturbed Areas.	• Efficient equipment utilization (achieving the same volume of work while maintaining lower diesel consumption for lower gas emissions.) • Require regular maintenance of vehicle and equipment. • Regular preventive maintenance. • Monitoring of fuel consumption. • Consider buffer zones at areas near communities; development of green belt/plantation in the safety zone • Progressive rehabilitation thru tree planting to sequester carbon emissions from quarry and transport operations • Regular Ambient Noise Monitoring.	• Daily Inspection of Crushing Plant and Heavy Equipment to check equipment worthiness. • Monitoring of fuel consumption. Submission of Energy consumption Report to MGB every Quarter. • Plant high-rise and thick trees around quarry areas that will serve as a buffer zone Coordinate • Tree Planting activities as part of Progressive Rehabilitation. • 100% Quarterly turn-over of Mined out Areas for Progressive Rehabilitation. • 100% Quarterly Air Quality Sampling & Monitoring: March (25%), June (25%), September (25%) December (25%).

Potential Impacts	Project Phase/ Activity	Management Plan for Prevention, Mitigation and Enhancement	Target Efficiency
31. Noise generation from crushing plant and equipment operation	1. Site Preparation Clearing, and Earthwork 2. Construction of Additional Roads 3. Construction of Crushing Plant and other Facilities. 4. Pre stripping activities at the quarry site 5. Clearing and Grubbing 6. Ore Extraction, Loading, and Hauling 7. Stockpiling 8. Port Operations (Barging and Shipping) 9. Structure Decommissioning 10. Rehabilitation of Mine Disturbed Areas	• Installation of noise suppression accessories to the machineries (i.e. mufflers). • Provision of PPEs to employees directly working at the active areas. • Free medical assistance for the community. • Regular road maintenance. • Use of vegetation buffer to minimize noise. • Require regular maintenance of equipment both inhouse and Contractors. • Regular plant preventive maintenance. • Regular Ambient Noise Monitoring.	• 100% Provision of Personal Protective Equipment • Daily Inspection of Crushing Plant and Heavy Equipment • 100% Conduct of Ambient Noise Quality Sampling (Quarterly) to be conducted in March (25%), June (25%), September (25%), December (25%).
32. Noise generation from drilling and blasting.	1. Drilling 2. Blasting	• Drilling machine shall be fitted with dust suppression, collection and disposal arrangement. • Deep wetting of drilling zones shall be done by water sprinkling before starting drilling. • During the drilling operations efforts shall be made to reduce dust generation by taking appropriate measures • Drilling and Blasting operation via Third-Party experts. • Implementation of controlled blasting techniques such as single hole firing, trim blast, and pre-splits. • Regular noise quality monitoring.	• Drilling will be done Once a Week • 100% Conduct of Noise Quality Sampling (Quarterly) to be conducted in March (25%), June (25%), September (25%), December (25%).

Potential Impacts	Project Phase/ Activity	Management Plan for Prevention, Mitigation and Enhancement	Target Efficiency
33. Human health impacts from air and noise pollution	1. Site Preparation Clearing, and Earthwork 2. Construction of Additional Roads 3. Construction of Crushing Plant and other Facilities. 4. Pre stripping activities at the quarry site 5. Clearing and Grubbing 6. Ore Extraction, Loading, and Hauling 7. Stockpiling 8. Vehicle operation (transportation of goods and people) 9. Port Operations (Barging and Shipping) 10. Structure Decommissioning 11. Rehabilitation of Mine Disturbed Areas. Drilling and Blasting	• Provision of Personal Protective Equipment (PPE) for employees directly working at the active sites. • Implementation of health programs under SDMP. • Regular briefing on safety hazards and safety practices at work • Regular Ambient Air and Noise Monitoring.	• 100% Provision of Personal Protective Equipment • Implementation of quarterly medical missions and other health programs through the SDMP. 100% Conduct of Air and Noise Quality Sampling (Quarterly) to be conducted in March (25%), June (25%), September (25%), December (25%).
34. Safety and Health Impacts from Blasting: o Fly Rock Generation o Generation of fines and dust is influenced by several blasting and rock parameters Release of Fumes	Blasting	• Contract an Accredited Third Party to Conduct Drilling and Blasting Activity • Implementation of controlled blasting techniques such as single hole firing, trim blast, and pre-splits. • Follow the prescribed blasting specifications. • Provision of Personal Protective Equipment (PPE) for employees directly working at the active sites. Implementation of health programs under SDMP.	• Blasting Parameters: o Ammonium Nitrate with Fuel Oil (ANFO) o Cast Primer 250 gms o NONEL Surface Connector x 6 metres o In-hole delay, 500ms x 12 metres o Detonating Cords, 6 grams Cast Primer 250 gms o NONEL Surface Connector x 6 metres o In-hole delay, 500ms x 12 metres o Detonating Cords, 6 grams • Implementation of quarterly medical missions and other health programs through the SDMP.
35. Occupational Hazards from Issues of Structural stability of the Plant	1. Crushing Plant Operation	• Crushing Plant Facility will undergo detailed stability analysis. • Structural analysis takes into consideration a number of foreseeable forces including gravitational (based on rated capacity), dynamic, wind and manual forces.	• Full compliance to the Building Code of the Philippines. • 100% Daily Toolbox Meetings before each shift. • 100% conduct of regular monitoring for signs of instability

Potential Impacts	Project Phase/ Activity	Management Plan for Prevention, Mitigation and Enhancement	Target Efficiency
		• Analysis take into consideration the machines expected operating configuration, envelope, and approved operating conditions (i.e. slope) • Provision of Personal Protective Equipment (PPE) for employees directly working at the active sites. • Safety Orientation for Employees • Regular stability monitoring	
36. Stability issues from stockpiling (i.e. Rainwater absorption and slumping)	1. Stockpiling	• Proper stockpiling. • Provision of stockpile cover when it rains. • Provision of Personal Protective Equipment (PPE) for employees directly working at the active sites.	• Stockpile slope should now be greater than 70 degrees. • 100% conduct of regular monitoring for signs of instability. • 100% Provision of Personal Protective Equipment
37. Vehicular accidents	1. Ore Extraction, Loading, and Hauling 2. Stockpiling 3. Vehicle operation (transportation of goods and people)	• Defensive Drivers' Training • Safety Orientation for Drivers	• 100% Provision of Personal Protective Equipment • 100% Daily Toolbox Meetings before each shift.
38. Work safety hazards related to demolition of structures (industrial accidents resulting to physical injuries)	1. Structure Decommissioning 2. Rehabilitation of Mine Disturbed Areas.	• Risk Assessment and Management Plan included as part of the Mine Closure Planning • Safety Orientation for Employees • Provision of Personal Protective Equipment (PPE) for employees directly working at the active sites.	• Mine closure planning and review every 2 years. • 100% Daily Toolbox Meetings before each shift. • 100% Provision of Personal Protective Equipment
39. Safety hazards related to long-term structural stability of rehabilitated areas	1. Structure Decommissioning 2. Rehabilitation of Mine Disturbed Areas.	• Conduct Geotechnical slope stability analysis prior to and after final rehabilitation	• 100% Implementation of a Final Mine Rehabilitation and Decommissioning Plan (FMRDP). • Third-party stability analysis every 2 years. • 100% conduct of regular monitoring for signs of instability

Potential Impacts	Project Phase/ Activity	Management Plan for Prevention, Mitigation and Enhancement	Target Efficiency
40. Displacement of local workers and Loss of source of income (employment, business opportunities, etc.) from Project closure	1. Rehabilitation of Mine Disturbed Areas 2. Final Turnover of Project Facilities	• Implementation of Labor Support Policies and Programs during the early stages of operation to improve the employment capacity of the workers in preparation to the job transition. • Series of capacity building programs for the community which will include organizational strengthening, capability assessment, enhancement trainings, financial management, project management, etc. • Post mining sustainable livelihood program. • Retrenchment package provided for the employees in accordance to the Labor Code. • Sustainability planning of the livelihood component of the SDMP.	• Stakeholder consultation on sustainable livelihood planning. • Regular stakeholder consultation on SDMP Program planning and implementation. • 100% Implementation of Sustainable Livelihood under the Final Mine Rehabilitation and Decommissioning Program (FMRDP).
41. Less income to LGU and National Government due to termination of taxes from the Project	1. Rehabilitation of Mine Disturbed Areas 2. Final Turnover of Project Facilities	• Sustainability planning of the projects under SDMP. • Capacity building for the locals • Post mining sustainable livelihood program.	• Regular stakeholder consultation on SDMP Program planning and implementation. • 100% Implementation of a Final Mine Rehabilitation and Decommissioning Plan (FMRDP).
42. Security Issues: o Theft of dismantled facilities/ components with residual value. o Intrusion of outsiders/ illegal claimants in the Project area	1. Structure Decommissioning 2. Rehabilitation of Mine Disturbed Areas.	• Maintenance of a Security group regularly patrolling the area • Security checkpoints to control access to the area • Community Relations Office to remain during the Mine Closure Rehabilitation Period	• Checkpoints at every entry and exit points of the MPSA. • Local coordination (LGU, IPs) through regular meetings and consultation.