

Gutalac Nickel Project

Environmental Impact Statement

**FLORJENMAR MINING AND
DEVELOPMENT CORPORATION**



*PREPARED BY
PRISM EXPRESS CONSULTING, INC.*



**ENVIRONMENT
& CLIMATE CHANGE
ADVISERS INC.**

Ang kopya ng Report o tinatawag na Environmental Impact Statement (EIS) ay maaring makuha gamit ang link sa ibaba:

https://drive.google.com/drive/folders/1PYYNWZHHZcnj_1dhtap0kOm5IJJaGGY1t .

Para sa iba pang detalye, maaring tumawag sa opisina ng EMB Office o tumawag sa (02) 8539-4378 website: www.eia.emb.gov.ph

BUOD

E.S. 1.0 Mga Detalye ng Proyekto

Table E.S.- 1 Simpleng Impormasyon sa Proyekto

Pangalan	Gutalac Nickel Project (GNP)																										
Lokasyon	Ang Exploration Permit (EP-010-2022-IX) ay nasa loob ng Munisipyo ng Gutalac sa kanlurang bahagi ng Mindanao or may layo na 200kilometro sa Zamboanga City; or ito ay 70 kilometro sa hilagang kanluran ng bayan ng Ipil; or 170 kilometro sa timog kanluran ng Dipolog City.																										
Sukat at Laki ng Proyekto	Ang sukat ng Exploration Area – 5,426.57 hektarya ay nasa loob ng Exploration Permit (EP) ng Florjenmar Mining & Development Corporation bilang EP -010- 2022-IX; it ay may laki na approx. 5,426.57 hektarya sa Munisipyo ng Gutalac Proposed Mining and mining components under this ECC application – 114.50 ha Annual ore extraction rate – 500,000 metric tons per year for 10 years																										
May-ari	Florjenmar Mining & Development Corporation																										
Lugar ng Opisina	Barangay San Isidro, Gutalac, Zamboanga del Norte																										
Opisina sa Lugar ng Mina	Barangay Poblacion, Gutalac, Zamboanga del Norte																										
Mga Bahagi ng Proyekto	Ang mga bahagi ng proyektong minahan ay: <table><tr><th>Pasilidad/Bahagi</th><th>Dami</th><th>Sukat /Laki (ha)</th></tr><tr><td>Minahanan</td><td>1 meridional block</td><td>81.00</td></tr><tr><td>Imbakan</td><td>3 sites</td><td>12.00</td></tr><tr><td>Kampo</td><td>1 location</td><td>4.00</td></tr><tr><td>Kalsada</td><td>3 kilometro haba</td><td>10.00</td></tr><tr><td>Imbakan malapit sa pier/port</td><td>2 sites</td><td>3.00</td></tr><tr><td>Iba pang bahagi (kasama na ang 6 settling ponds)</td><td>2 locations</td><td>4.50</td></tr><tr><td>Kabuuan ng sukat (FOOTPRINT) para sa aplikasyon ng ECC</td><td>Mine/quarry including appurtenant mine facilities</td><td>114.50</td></tr></table>			Pasilidad/Bahagi	Dami	Sukat /Laki (ha)	Minahanan	1 meridional block	81.00	Imbakan	3 sites	12.00	Kampo	1 location	4.00	Kalsada	3 kilometro haba	10.00	Imbakan malapit sa pier/port	2 sites	3.00	Iba pang bahagi (kasama na ang 6 settling ponds)	2 locations	4.50	Kabuuan ng sukat (FOOTPRINT) para sa aplikasyon ng ECC	Mine/quarry including appurtenant mine facilities	114.50
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Mga Gawain ng Exploration Activity	Ang programa ng Exploration at drilling ay ginawa sa loob ng EP sa Gutalac noong nakaraang 2 taon; nagsimula noong April 25, 2022. Ang mag ito ay regional prospecting, reconnaissance and semi-detailed geological mapping, and sub-surface geological investigation.																										
Uri ng Aplikasyon ng ECC	Environmentally Critical Project (ECP) by EMB Memorandum Circular No. 2014-005 (July 7, 2014) – Guidelines for Coverage Screening and Standardized Requirements under the Philippine EIS System, Amending Relevant Portions of MC 2007-002 Under Sub Heading 2.1.2 – Classified as Extraction of Metallic ores/minerals (on shore) with an area ≥ 25 hectares																										
Permiso ng Proyekto mula sa Pamahalaan	Exploration Permit bilang EP-010-2022-IX naigawad sa Florjenmar Mining & Development Corporation noong April 25, 2022; may sukat na approx. 5,426.47 hektarya o nasasakop sa 64 meridional blocks. Ang aplikasyon ng ECC sa DENR ay may laki o sukat lamang na one (1) meridional block (Parcel 2) mula sa 64 blocks pinapayagan ng pamahalaan																										
Dami ng miminahin sa lugar	500,000 metriko tonelada kada taon (MMTPY)																										
Buhay ng mina	7 taon																										
Halaga	Sa loob ng 7 taon ay maaring gumastos ng 1.70 billion piso																										
Dami ng trabahante	Higit sa 400 ibat ibang uri ng trabaho mula sa mga engineers, staff, personnel, at workers																										

Kinatawan ng May-ari	Mr. Mariano Candelaria, Jr. Presidente Florjenmar Mining and Development Corporation candelarianonoy50@gmail.com Engr. Aaron Rey Altez General Manager Zamboanga Nickel Corporation arcaltez@gmail.com
Mga Gumawa ng Pag-aaral:	Prism Express Consulting, Inc. in collaboration with Environment & Climate Change Advisers, Inc. Engr. Allan R. Plete EIA Project Director allanplete@yahoo.com www.prismexpressconsultinginc.com

Table E.S.- 2 Buod ng Pag-mina

Lugar	Ang lugar kung saan gagawin ang pag-mina sa nasa loob ng political jurisdiction ng Barangay Bacong sa Munisipyo Gutalac sa hilagang bahagi ng Zamboanga, Region IX.																
Rationale	Ang halaga ng matal or Metal prices, particular ang nickel ay pabago-bago sa merkado; ang nickel ay halos 4-year na apektado. Ang presyo ay bumaba noong 2008 at inaasahan tataas sa 2024, maliban sa global pandemic noong 2019. Kayat naniniwala ang FMDC ang mine nickel ay gaganda sa mag panahon na ito. Ito ay magbibigay din ng pondo na maaring magamit sa social development projects at pagdami ng trabaho sa local na komunidad ng Gutalac.																
Proseso ng Pag-mina	Ang Lateritic nickel mineralization ay Nakita at laganap sa Gutalac, Zamboanga del Norte noon pang 1990s na nakuha ng exclusive rights ng Florjenmar Mining (FMDC). Ang deposito dito sa Gutalac ay mababaw kayat ang proseso o method of mining ay open cast or bench mining. Ang kukuhanin na mina ay limonite and saprolite ores.																
Mga bahagi ng Proyekto	Ang Gutalac Nickel Project or GNP ay nasa loob ng Exploration Permit (EP) na iginawad sa Florjenmar Mining & Development Corporation bilang EP -010- 2022-IX; may sukat na approx. 5,426.57 hektarya sa Munisipyo ng Gutalac. Mga bahagi ng minahan: <table border="1"> <thead> <tr> <th>Pasilidad/bahagi</th><th>Sukat/laki (ha)</th></tr> </thead> <tbody> <tr> <td>Sukat ng mina</td><td>81.00</td></tr> <tr> <td>Imbakan</td><td>12.00</td></tr> <tr> <td>Kampo</td><td>4.00</td></tr> <tr> <td>Kalsada</td><td>10.00</td></tr> <tr> <td>Imbakan malapit sa Port</td><td>3.00</td></tr> <tr> <td>Iba pang bahagi (kasama ang 6 settling ponds)</td><td>4.50</td></tr> <tr> <td>Laki ng sukat sa aplikasyon ng ECC</td><td>114.50</td></tr> </tbody> </table>	Pasilidad/bahagi	Sukat/laki (ha)	Sukat ng mina	81.00	Imbakan	12.00	Kampo	4.00	Kalsada	10.00	Imbakan malapit sa Port	3.00	Iba pang bahagi (kasama ang 6 settling ponds)	4.50	Laki ng sukat sa aplikasyon ng ECC	114.50
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Pagsasalarawan ng Exploration Phase	Ang Exploration Phase sa Nickel Laterite mining sa loob ng Parcel 2 (only) ay tapos na. Ito ay nai-sumite na sa ahensay ng national government. Ang bahagi na ito ng exploration ay binubuo ng regional prospecting, reconnaissance, at semi-detailed geological mapping, and sub-surface geological investigation. Ang FMDC ay gagawa ng ilang hakbang upang itaas ang basic social and environmental programs sa lugar at kumunidad ng Bacong at Gutalac.																
Pagsasalarawan ng Pre-construction Phase	Ang pre-development stage sa minahan at pagkuha ng mga permiso gaya ng acquisition of permits and approvals, pagtatapos ng detailed engineering at actual na pagsusuri ng lupa o field investigations, at marami pang iba. Ang pagkua ng mga permiso ay nagsimula pa noong 2020, kasabay ng actual field verification and investigations and technical studies. Kapag tapos nap ag-aaral or mine feasibility study, ang iba pang permiso na kukuhanin sa ibat ibang sangay ng gobyerno ay:																

	• Declaration of Mining Project Feasibility (DMPF) • Mineral Product Sharing Agreement (MPSA) • Environmental Compliance Certificate (ECC) • Tree Cutting Permit • Water Rights Permit • Other Permits such as Permits to Construct and Operate
Pagsasalarawan ng Construction Phase	Sa panahon ng construction, ang mga pasilidad ng mina o mining facilities ay ang sumusunod: Surface Mine, Waste Rock and Overburden Area, Stockyard, and campsite. Ito ay tatangalan ng ano mang puo o halaman sa lugar upang makamit ang tamang sukat or graded for final structure construction. Ang ibabaw na lupa o Topsoil na mas mataas ang nutrient ay ilalagay sa isang tabi o tamang lugar upang magamit sa panahon ng rehabilitation program. Ang mga puno o timber na malilikom mula sa aktibidad ng construction ay maaring ibigay o repurpose projects ng LGU/DENR para magamit ng komunidad. Meron din iba pang mine associated infrastructures na gagawin gaya ng settling ponds, protection dikes, at iba pa upang pangalagaan ang kalikasan.
Pagsasalarawan ng Operations Phase	Ang pagkuha ng lupang mina or Mine Production ay kaagad isasagawa matapos makauha ng mga clearances at permits kasama na ring matapos ang construction and developments designs. Ang FMDC ay nanganako na susunod sa mahigpit na pamantayan ng DENR Administrative Order (DAO) 2018-19 tungkol sa pagtataguyod ng maximum disturbed areas for Mines at any one time. Ang pinakamalapad na sukat ng lupa sa operasyon o tinatawag na disturbed area ay 50 hectares of the (approx. 81 ha surface area) at any one time. Ang mga lugar sa pagsasagawa ng temporary revegetation or progressive rehabilitation ay gagawain kaagad.
Pagsasalarawan ng Abandonment Phase	Ang stratehiya ng Progressive rehabilitation strategy, sapagkat ito ay mandatory (mining law), ay gagawain kasama ng lahat ng all-applicable mitigation and management upang mabawasan ang negatibong epeko ng pagmina sa lugar ng Gutalac. Sa halip na malakihan kaagad o large-scale rehabilitation works, ay gagawain muna kung kakayanin ang pagtambak or backfilling of the mind-out areas or spaces/voids upang ma control ang nakatiwangwang o open and exposed mine sites. Sa pangkalahatan, ang abandonment programs sa panahon ng rehabilitation and closure period ay: • Structure Demolition/ Decommissioning. • Decontamination or Remediation, if applicable. • Structural Improvements (erosion control, soil stabilization, re-vegetation, infrastructure support). • Soil Treatment, if applicable. • Re-vegetation and Reforestation.
Gastusin ng proyekto	1.70 Billion Pesos
Iskedyul at tagal ng Proyekto	Aabot ng 6-8 buwan sa Project Construction at 7 taon ang tagal buhay ng Mine Operation.

E.S. 2.0 Maikling Buod ng Pag-aaral (EIA Process)

E.S. 2.1 Pagsasalarawan

Natapos na ng Florjenmar Mining & Development Corporation or FMDC ang initial exploration sa lugar ng Parcel 2 sa Gutalac gamit ang permiso ng Exploration Permit (EP) mula sa MGB noong 2022.

Noong dati, ang mga kailangan na requirements mula sa EMB regulations ay ang pagkuha muna ng Mineral Production Sharing Agreement (MPSA) or Application for an MPSA (APSA) bago mag apply ng Environmental Compliance Certificate (ECC). Subalit nitong nakaraan lamang, mayroong bagong policy and regulations ang MGB galling sa Memorandum dated February 22, 2022 Re: Checklist of Requirements for Declaration of Mining Project Feasibility under Exploration Permit; at ito ay nangangailangan muna ng ECC bago ang application para sa MPSA.

Kayatsa para sa proyektong ito, ang Exploration Permit and Final Exploration Report (FER) ay sapat na munang dokumento upang maging basehan ng karapatan o authority over the Parcel 2 (project area) ng Florjenmar Mining & Development sa Bacong, Gutalac.

Ang FMDC ay magsusumite ng isang Environmental Impact Statement (EIS) Report sa denr upang gamitin sa aplikasyon nito ng environmental clearance or ECC. Ang pagkuha ng ECC ay isang basehan upang makapagsagawa ng pagmimina or mine activities sa panahon ng construction, development, and operation ng Gutalac Mining Project (GNP).

E.S. 2.2 Grupo ng EIA Study

Ang Prism Express Consulting, Inc. ay kinumision ng FMDC upang gumawa ng malayang pagaaral or independent EIA study for Gutalac Nickel Project. Ang listahan sa ibaba ay mga miyembro ng pag-aaral.

Table E.S.- 3 Grup ng EIA

Especialista/EIA Consultant Members	Module	Rehistro sa DENR/EIA Preparer Registration No.
Engr. Allan Plete	EIA, Taga pangasiwa	IPCO-379
Engr. Aldwin A. Camance	EIA, Lider ng Pag-aaral/Environmental Specialist	-
Dr. Donato dela Cruz	EIA, Tagasuri	-
Dr. Merlyn Rivera	Especialist ng Sociology / Social Development/ IEC	IPCO-298
Mr. Manuel Potrido	Tagakalap ng datos, Researcher, IEC, FGD, and Socio Economics	-
Engr. Emerson Darroles	Tagakalap ng datos, Researcher, Water Quality and General Ecology	IPCO-153

E.S. 2.3 Iskedyul ng mga Gawain ng EIA

Table E.S.- 4 EIA Activities

Petsa	Mga ginawa
October 2022	Pagsagawa ng pagsusuri sa lugar sa Gutalac para sa Terrestrial/Aquatic Flora and Fauna Assessment, Socio-economic Survey
October 19, 2022	Marine Water, Surface Water, and Groundwater Sampling (Wet Season)
October 6-13 & 18 2022	Mga pagpupulong or IEC Meetings (Brgy. Bacong, Brgy. Bayanihan, Gutalac LGU MDRRMC, MENRO, MEO, MHO, MPDO, MAO)
October 14, 2023	Pagkalap ng datos, Community Profiling for Impact Assessment
October 19-20, 2022	Pagkalap ng datos, Baseline Assessment of the Soil Attributes
October 19-20, 2022	Pagkalap ng datos, Meteorological Parameters Assessment
November 3-11, 2022	Pagsagawa ng Terrestrial Flora and Fauna Biodiversity Assessment (Wet Season)
November 24-26, 2022	Pagsagaw ng Biodiversity Assessment of Aquatic Fauna and Flora (Wet Season)
January 11, 2023	Pagsagawa ng Public Scoping Meeting onsite
January 27, 2023	Pagwagawa ng Technical Scoping Meeting with EMB and the Review Committee Members at EMB-CO
March 10-15, 2023	Pagsagawa ng Focus Group Discussions (FGDs) in 4 barangays of Bacong, Bayanihan, Pitawe, and Mamawan
May 19, 2023	Pagkuha ng Marine Water, Surface Water, and Groundwater Sampling (Dry Season)
May 19, 2023	Pagkuha ng Ambient Air and Noise Level Monitoring (Dry Season)
May 19-23, 2023	Pagsagawa ng Terrestrial Flora Assessment (Dry Season)

May 24-28, 2023

Pagsagawa ng Biodiversity Assessment of Aquatic Fauna and Flora (Dry Season)

E.S. 2.4 Pagsasalarawan ng EIA Methodology

Table E.S.- 5 Buod ng EIA Process

Metolohiya ng EIA	Ang paggawa ng report or EIS ay base sa mga panuntunan o guidelines and regulations ng DAO 2003-30 (Philippine Environmental Impact Statement System / Revised Procedural Manual (RPM), DAO 2016-08/DAO 2021-19 for the Revised Effluent Standards, DAO 2000-81 and DAO 2005-10 for the stipulated IRR of Clean Air and Clean Water act, respectively. Gumamit ng panuntunan ng DAO 2017-015 on Public Participation under PEIS System and EMB MC 2020-30 for the Interim Guidelines on Public Participation. RA 9003 para sa Ecological Solid Waste Management Act alinsunod sa panuntunan ng LGUs gaya ng Comprehensive Land Use Plan and LGU profile of the Municipality of Gualac, at iba pang pamantayan ng DENR environmental regulations.
Lupa	Ang aktuwal ng beripikasyon or Actual verification and investigation of the current setting of the geology, landform, land use, and other terrestrial information was made and compile and assess them (environmental data) for proper impact identification, prediction and assessment. The Land Use and Classification and Geology wherein the methodology and approach on baseline characterization considers the CLUP of Gualac and the available information and reports from MGB, PHIVOLCS, PAGASA, NAMRIA, etc.
Tubig	Para sa katubigan, ang pagaaral ay binubuo ng pagsaliksik ng Hydrology and Hydrogeology, at base din sa CLUP ng Gualac at iba pang datos mula sa MGB, NAMRIA and PHIVOLCS. Sa kalidad ng tubig, ang mga water samples ay kinuha mula sa ilog/sapa at ilalim ng lupa. Ito ay sinuri sa pamamagitan ng laboratory na itinalaga ng DENR gamit ang physicochemical and microbiological analyses base sa guidelines ng DAO 2016-08/2021-19 para sa ilog or sapa at karagatan or marine waters. Kasama din sa pagsusuri gamit ang PNSDW 2017 para sa tubig sa ilalim ng lupa.
Hangin	Ang pagsukat ng kalidad ng hangin or ambient air quality sa Bacong ay gumamit ng mga datos at map amula sa PAGASA station in terms of Meteorology and Climatology.
Kumunidad	Ang mga kadahilanan upang magsagawa ng pagaaral ng komunidad at mga tao na nakatira dito ay ginawa na din. Ito ay ang pagsusuri ng socioeconomics and public health. Nagkaroon ng ibat ibang pagpupulong sa mga tao at mga opisyal ng barangay at bayan gamit ang tinatawag na public scoping, focus group discussion, at iba pang consultations sa Bacong at Gualac. Ang mga impormasyon na ito ay gagamitin upang suriin ang epekto at risiko or panganib, kung meron man, dulot ng mina sa panahon ng construction, operation, at abandonment phases ng proyekto.
Partisipasyon ng publiko	Mayroon mga kilalang tao sa lugar or ang tawag ay Key informants (barangay and municipal levels) na pinili upang konsultahin tungkol sa mina.

E.S. 2.4.1 Pagdinig sa hinaing ng publiko

Ang Public Hearing ay ginagawa upang madining ang mga hinanaing, sentimyento, kuro kuro, opinion at iba pang komento ng mga tao tungkol sa mina. Ito ay base na rin sa pangangailang or requirements ng DAO 2017-15, "Guidelines on Public Participation Under the Philippine Environmental Impact Statement (EIS) System". Gaganapin ang public hearing kapag

natapos na ang pormal na pagrepaso ng mga formal technical review ng EIA committee and EMB.

E.S. 3.0 Buod ng pagaaral sa lugar gamit ang EIA

E.S. 3.1 Buod ng kalagayan sa lugar

E.S. 3.1.1 Buod ng sa Kalupaan

Table E.S.- 6 Buod ng kalupaan sa lugar

Kalupaan	Kalagayan ng Lugar sa ngayon
Gamit ng lupa at klasipikasyon	Ang Municipality ng Gutalac ay lugar na mataas ang potential sa agrikultura na may 15,032 hektarya or 30.72 porsiyento ng kabuuan ng lupa ng Gutalac. Ang malaking bahagi ng lupa sa Gutalac ay klasipikado na forest reservation area, o may sukat na 32,730 hektarya or 66.90 porsiyento. Ang Parcel 2 base sa pamantayan ng mining industry development ay wala o mababa ang potensiyal para sa agrikultura sapagkat ang lupa dito ay laterite soil. Hindi ito angkop para sa pagtatanim ng crops at fruit trees. Ang natural na uri ng gubat o tinatawag na secondary forest cover sa lupang laterite soil ay hindi rin sapat para mapanatili ang gamit na kakahuyan o timber source.
Heyolohiya/Heyomorpholohiya	Ang Parcel 2 ay larawan ng ibat ibang topogropiya. Ang taas o Elevation at umaabot mula 15 hanggang 680 meters above sea level, at halos impluwensa ng bato or rock types. Ang kanlurang bahagi ng lugar ay mas matataas at matarik na topograpiya. Ang Parcel 2 exploration area at nasa Sulu-Zamboanga Arc terrane at tinatawag na bathymetric high at continental, arc, and ophiolite affinities (Pubellier et al., 1991; Yumul et al., 2004; Sherlock and Barrett, 2004). Ang malaking bahagi ng Parcel 2 ay metamorphic rock basement na may ultramafic rocks cut by diorite intrusion.
Lindol or Seismology /Tectonic	Ang Parcel 2 ay may layong approx. 21.2 kilometro hilagang kanluran ng Zamboanga Fault System; ito ay ligtas sa pagkasira or ground rupture.
Panganib sa kalupaan or Geohazards	Ang Parcel 2 ay delikado sa ulan o rain-induced landslides sapagkat madami ang luma o old or inactive landslides doon. Base sa ginawang site-specific geotechnical investigation, hindi angkop na bahayan ng mga tao. Sa datos ng HazardHunterPH, ang lupa sa lugar ay ligtas sa pagkatunaw o liquefaction.
Mineral/Mineralization	Ang Zamboanga Peninsula ay nangunguna sa pinakamataas na uri ng metal or multiple metallic resources sa Pilipinas gaya ng volcanogenic massive sulphides (VMS), epithermal gold, porphyry copper at chromites. Ang pagkakaroon ng peridotite at dunite sa lugar ay indikasyon ng mataas na uri ng chromite at nickel laterite deposit.
Uri ng lupa/Pedology	Mahigit na 90% ng lupa o soil type sa kabuoan ng EP tenements ay napapaloob sa Pasonanca loam with minor San Manuel silt loam and Pellupandan sandy loam. (Adopted from an internal report by N.V.M. Primaleon).
Anyo ng buhay sa kalupaan o Terrestrial Ecology	Ang Parcel 2 mining site ay isa ng logged over area noong pang matagal na panahon. Ang mga tanim na puno sa mga kabundukan dito ay tinatawag na second growth forest. Ayon sa ulat ng mga taga roon,

Kalupaan	Kalagayan ng Lugar sa ngayon
	ang puno ng kahoy na pinuputol doon ay magandang kalidad sa mababang halaga. Karamihan sa mga tanim nap uno dito ay kabilang sa species na Dipterocarpaceae, Sapotaceae at Myrtaceae family. Sa datos ng EIA na ginawa, ang kabuoang bilang ng halaman o floras ay 144 plant species that belong to 105 genera and composed of 66 families.

E.S. 3.1.2 Buod ng sa Katubigan

Table E.S.- 7 Buod ng katubigan sa lugar

Katubigan	Kalagayan ng lugar sa ngayon
Tubig sa ilalim ng lupa or Hydrology/ Hydrogeology	Ang kalakhan ng Gutalac, ang daloy or agos ng tubig sa ilalim ng lupa nito ay combination of coarse dendritic and semi-rectangular patterns. Ang lugar ay may impluwensya mula sa NNE-SSW and NE-SW structures/lineaments. Mayroon tatlo (3) masasabing malaking watersheds na may tatlo (3) din ilog patunong Sulu Sea: Panganuran River, Sibalic River and Quipit River. Ang pinakamalaki na watershed (~720.993km ²) ay may kaugnayan sa Quipit River at tributaries nito. Ang kalapit na watershed ay may sukat na 60.30km ² at may kaugnayan sa Sibalic River at tributary streams.
Agos ng tubig sa Karagatan	Ang hilagang silangan na bahagi ng Zamboanga Peninsula ay isang mahabang baybayin, at may biglang pagliko na may oryentasyon na 122°E and 123°E. ang lupa sa karagatan ay makitid na may lalim na 200-m isobath sa lugar na may 4–10 kilometro mula sa baybayin.
Kalidad ng tubig tabang or Freshwater Quality	Gumamit ng lima (5) water quality stations upang pag-aralan ang kalidad ng tubig tabang: isa (1) groundwater station, dalawa (2) ilog o surface freshwater at dalawa (2) karagatan o coastal marine water station. Ito ay datos sa panahon ng tag-init or season. Base sa resulta ng Groundwater station, lahat ay pumapasa sa parametro ng regulasyon maliban lamang sa HPC, <i>E. Coli</i>, Fecal Coliforms, at Total Coliforms. Sa ilog or Surface Freshwater stations at karagatan o Coastal Marine Water, ang Fecal Coliforms lamang ang hindi pumasa sa pamantayan. Kumuha din ng datos sa panahon ng tag-ulan or wet season. Base sa resulta sa Ground Water sampling, lahat ng parametro ay pumasa maliban sa HPC, <i>E. Coli</i>, Fecal Coliforms at Total Coliforms. Sa ilog or Surface water sampling, pumasa din sa Class A standards maliban sa Fecal Coliform. Sa karagatan or Marine water sampling, lahat ay pumasa sa parametro. Kung ihahambing, nagkaroon ng Coliforms sa Ground water and Surface water sa parehong panahon ng dry and wet season. Samantala sa Marine waters, sa panahon ng tag-ulan ay may naitala na mataas sa coliform, at noong tag-init or dry season ay mas mababa ang bilang.
Buhay sa karagatan o Marine Ecology	Ang tinatawag na Bacong Reef na may sukat na reef flat 200 meters ay malapit sa baybayin, at nakikita malapit sa mangrove at seagrass communities. Nakita na malalaking boulders of corals at mga bagong coral reefs na sumisibol. Malinaw ang tubig sa dagat at masasabing ang mga reef ay fair to excellent condition. Ang ilalim ng dagat ay mga buhangin at mayroon

Katubigan	Kalagayan ng lugar sa ngayon
	konti na lupa or silt/mud sa malapit sa bunganga ng ilog. Ang tinatawag na Mean live hard coral cover sa lahat ng lugar ng sampling stations sa baybaying dagat ng Bacong ay masasabing nasa 8.6% hanggang 52% ang reef area at ito ay Maganda or fair to good condition. Mayroong siyam (9) na family of hard corals at dalawa (2) na soft corals sa lugar. Ang mga reef-associated fishes or isda ay may tinatayang dami na average of 28.5 families and subfamilies sa lahat ng stations sa Bacong. Ang Species richness ay nasa 21.9 species per 500m² to 25.8 species per 500m². Meron din Nakita ang mga mananaliksik na apat (4) na common Indo-Pacific bottlenose dolphins (<i>Tursiops aduncus</i>) sa baybayin malapit sa Bacong. Meron din green sea turtle (<i>Chelonia mydas</i>) sa may coral reef. Mayroong kabuoan na walo or eight (8) species of seagrass namely <i>Thalassia hemprichii</i>, <i>Halodule pinifolia</i>, <i>Halophila ovalis</i>, <i>H. minor</i>, <i>Cymodocea rotundata</i>, <i>C. serrulata</i>, <i>Thalassodendron ciliatum</i> and <i>Enhalus acoroides</i>. Meron din dalawa or two (2) macro-benthic algae belonging to two (2) families sa seagrass bed. Ang mga species na buhay lamang dagat na ito ay classified under the Least Concern Category base sa IUCN red list of threatened species. Sa kabuoan ng pagsusuri, ang seagrass cover ay 48.82% at masasabing FAIR condition based on Amran's seagrass condition index.
	Ang panahon na tinatawag na Zamboanga upwelling, mas maraming nahuhuli o nakikita ay small pelagic species na Indian oil sardine (<i>Sardinella longiceps</i>). Ang mga klase ng isda or Fish varieties na nahuhuli sa mga baybaying dagat sa Zamboanga, kasama na ang Gotalac ay; Spanish and King Mackerel (Tangigue), Marlins, Lapu-Lapu, Tuna (Blue and Yellow Fins, Big Eye, Long Tail and Skip Jack), Flying Fish (Bangse), Anchovy (Dilis/Bolinao), Mackerel Scad (Sigarilyo/Galongong), Ladien Oil Sardine (Tuloy), Gold Stripes Sardenilla (Malangse), Pony Fish (Whipfin – Tabilos, Splended – Palotpot, Common – Bakagan and Tooth Pony), Thread Fin Breams (Lagaw, Malintubong, Lalagan and etc) and Reef Fishes (Spinefoot), Snapper, Grouper, hind, emperor and surgeon fish.
Planktons sa dagat	May naitala na kabuoang twenty-two (22) genera of phytoplankton. Ang mean density ng phytoplankton ay nasa 187cells/mL⁻¹. May naitala din na kabuoang eleven (11) major zooplankton groups (adult and larval form) mula sa tatlo or three (3) sampling stations sa Gotalac. Ang computed mean density ng zooplankton ay nasa 27,667 individuals/m³.

E.S. 3.1.3 Buod ng sa Hangin at Ingay

Table E.S.- 8 Buod ng kalagayan sa lugar

Kalidad ng hangin at ingay	Kalagayan ng lugar sa ngayon
Klima or Meteorology/ Climatology	Ang lugar ng Gotalac ay nasa fourth type of climate (classified from Modified Corona's Classification System); tag-init sa December to April, tag-ulan sa June to October. Base sa datos ng PAGASA, ang Gotalac ay mas mataas na dami ng ulan or precipitation kada taon na 2,484.2 mm, sa buwan ng October ang pinakamataas na or value at 301.2 mm noong 2020. Ang klima sa Gotalac ay mainit, or hot, oppressive, and overcast. Ang temperature sa lugar ay nasa 74°F to 91°F at bihira lamang na bumaba sa 72°F or tumaas sa 94°F. ayon sa PAGASA Climate projections report, magkakaroon ng pagtaas ng temperature na 1.8 C to 2.2 C in 2050 (PAGASA, 2021). Ang datos ng ulan sa Zamboanga ay halos 5 buwan na ulan kada taon na mahigit 200mm ang dami ng ulan sa Dipolog samantala ay halos wala sa Zamboanga City.
Kalidad ng Hangin	Ang kalidad ng hangin sa lugar or tinatawag na ambient air quality ay masasabing malinis at tipikal na kalagayan ng isang rural areas or walang polyuson sa hangin. Base sa datos na nakuha, pasado sa pamantayan ng malinis na hangin para sa TSP concentrations for air quality. Ang masasabing dumi sa hangin ay nagmumula sa ilang sasakyan na dumadaan sa kalsada. Ang concentrations ng SO₂ and NO₂ mula sa sasakyan ay masasabi na malinis pa gamit ang maximum limit ng DENR.
Ingay	Ang Noise level ay ginawa rin gamit ang walo or Eight (8) stations sa loob at labas ng lugar ng proyekto. Base sa datos, ang Noise Level or highest peak noise readings ay nanggagaling sa mga sasakyan gaya ng trucks at motorsiklo na dumadaan sa kalsada.

E.S. 3.1.4 Buod ng sa Tao

Table E.S.- 9 Buod ng kalagayan ng lugar

Sa Tao at komunidad nito	Kalagayan ng lugar sa ngayon
Demograpiya	Sa tala ng Philippine Statistics Authority or PSA noong May 2020, ang populasyon sa Gotalac ay 36,090 at may pagtaas na 1.16% kada taon mula pa noong 2010. Ang bilang ng mga kabahayan or households noong taon 2020 ay 29,976.
Pasilidad na pangkalusugan	Walang hospital sa Gotalac. Ang karaniwang pangangailangang medical ng mga tao ay ginagampanan ng Municipal Health Office (MHO).

Kalsada	Ang Gotalac ay may haba na 170.176 kilometro na kalsada, 6 dito ay tulay or bridges sa bayan; 18 spillways at 3 pang tulay sa mga barangays.
Transportasyon	Mayroon na 4 buses at 6 PUVs sa mga sasakyan naghahatid ng mga pasahero mula at galing sa Dipolog City samantala 1 bus at 2 PUVs naman sa Zamboanga City. Ang Motorcycles or habal-habal ang karaniwang gamit na transportayson ng mga tao patungo sa mga barangays.
Kamalayan ng publiko, pananaw, at kanilang pagtanggap sa proyekto	Gumawa ng pagsuri gamit ang Household perception survey sa dalawang (2) direktang apektadong barangays ng Bacong at Bayanihan at (2) pang indirect impact barangays ng Pitawe and Mamawan. Mayroong nakalap na 212 respondents sa 4 na barangays. Ang resulta ng survey ay makikita sa sumunod na kabanata ng EIS.

E.S. 3.1.5 Buod ng mga isyu at pag-alala ng mga tao sa lugar

Pagbabago sa kalidad ng hangin

Ang kalidad ng hangin sa Gotalac ay masasabing napakalinis. Bagamat ang kalsada ngayon ay sanhi ng alikabok mula sa mga sasakyan, ang pagkakaroon ng mina ay maaring maging sanhi ng pagkakaroon ng mataas ng alikabok or fugitive dust mula sa malalaking trucks or heavy vehicles ng mina.

Nabanggit ng isang miyembro ng Subanen IP group ang kahalagahan ng halamang medical or medicinal plants, kung saan dito lamang sila umaasa na panggamot sa sakit. Sapagkat maari silang magkasakit mula sa mga makinaryang nagdudulot ng maduming vehicle emissions sa panahon ng mina. Nabanggit din ang malakihang pagkawala ng mg puno na maaring maging sanhi ng pagkakaroon ng sakit mula sa direct exposure to the sun (radiation) at ang pagtaas naman ng temperature upang maging sanhi ng pagkawala ng natatamang ginhawa mula sa malinis na hangin mula sa puno.

Dami at kalidad ng tubig

Halos lahat ng residente sa baybayin ng barangay kasama na ang Bacong ay umaasa lamang ng kita mula pangingisda sa dagat. Kapag malakas ang ulan, mahina ang huli ng isda sapagkat Malabo ang dagat.

Isang miyembro ng religious group ay nagsabi na ang ilog o sapa ay malinis subalit nagiging Malabo kapag maulan. Ang pinagkukunan nila ng tubid inumin ay mula pa sa Capunan River.

Nagaalala ang mga tao sa paglabo ng mga ilog kapag mayroon ng mina sa Bacong. Kapag may mina, maaring makaabala at makasira ng mga buhay sa dagat or marine resources at maapektohan ang hanapbuhay nila.

Nagaalala din sa paggamit ng kemikals mula sa mina. Maaring maging sanhi ng sakit pangkalusugan ng mga tao kapag hindi maayos ang paggamit nito.

Kalupaan (Agrikultura, gubat, bundok)

Ang agrikultura ang pangunahing pinagkukunan ng kita ng mga tao sa Gutalac. Meron mga puno ng niyog or coconut trees subalit sa lugar ng MPSA area, halos ang tanim dito ay cogon at lemon grass.

Nabanggit ng isang local na kapag mayroon ng mina, maaring itaboy nito ang mga pesteng insekto at hayop ilang gaya ng monkeys, wild pigs at birds, na kumakain sa mga pananim nila sa bukid gaya ng corn, coconut at ilang cash crop vegetables.

Nabanggit din ang pagkabawas ng agricultural na lupa sa Gutalac.

Ang pagtatapon ng lupa or unusable excavated earth materials mula sa mina ay maaring makasira ng karatig agricultural lands. Nagaalala din ang mga local ng maging malapit sa landslide at earthquake kapag masyoon minahan.

Ang pagkawala ng puno or any standing forest trees at pati na ang punong prutas or fruit trees ay maaring maganap.

Buhay-ilang

Base sa mga local, mayroon pang nakikita na buhay-ilang sa Gutalac gaya ng wild pigs, *halas*, monkeys, birds (kalaw), deer, wild chicken, snakes at paniki or bats. Sila ay makikita sa lugar na madaming mga puno or forested areas.

Maaring mawala or mabulabong ang mga buhay-ilang kapag masyoon ng mina. Maari din ito maging resulta mula sa mga sasakyan at trabahador ng minahan.

Mga katutubo or IP Groups

Ang malakking bahagi ng katutubo ay makikita sa barangay Pitawe. Ang dami nila ay roughly 10% ng pangkalahatan ng dami ng populasyon sa Pitawe. Nabanggit din na ang minahan ay magdudulot ng benepisyo gaya ng trabaho at subsidyo ng katutubo mula sa mina. Ito ay obligasyon ng mina sa katutubo base sa mga batas ng IP laws at MGB/NCIP rules and regulations.

Lokal na mangangisda

Nabanggit ng mga mangangisda na mababa at mura ang bentahan ng isda sa mercado. Ang isang tumpok ay may halaga lamang na Php10. Kapag may mina, maaring dumami ang kita ng mangangisda sapagkat dadami ang consumer at demand ng isda sa mercado.

Nagaalala din ang local sa red tide na maaring sanhi mula sa mina. Maapektuhan din ang sea weeds at fishes.

Magsasaka

Sa ngayon, pagsasaka at pangangisda ang pangunahing pinagmumulan ng kita ng mga local. Sa magsasaka, ang epekto ng mina ay maaring mula sa erosion.

Pinamumulan ng tubig inumin

Ang tubig inumin ay nagmumula sa mga bukal ng tubig or springs galing sa kabundukan. Dahil sa mina, maaring mawala ang mga puno at maapektuhan din ang tubig inumin. Maari din maganap ang water contamination at maapektuhan ang kalusugan ng mga tao.

Kalsada

Tanging motorcycles, “*skylab*” at maliit na trucks ang gamit na sasakyan patunog sa mga barangays kasama na ang Bacong.

Kapag mayroong mina, maaring gumanda ang mga kalsada subalit maari din tumaas ang aksidente dito sapagkat dadami rin ang biyahe sa mga sasakyan. Maari din makaranas ng pagdami ng alikabok lalo pa sa panahon ng tag-init at maging madulas naman ang kalsada kapag tag-ulan.

Local na transportasyon

Ang motorcycles, “*skylab*” at small trucks lamang ang gamit na transportasyon sa Gutalac. Ang upa or transportation fare ay napakamahal P300/trip or P600 para sa balikan ng biyahe.

Ang ilan na positibong epekto ng mina ay pagkakaroon ng mas maayos na kalsada mula sa bayan ng Gutalac hanggang barangay Bacong. May mabilis ng biyahe ng mga tao at mabilis ng transportasyon ng mga produkto mula sa bukid at bundok. Tataas din ang kalidad ng serbisyong pampubliko ng LGUs patungo sa mga malalayong komunidad.

Ang negatibong epekto sa transportayon ay pagtaas ng bilang ng mga sasakyan na magdudulot ng trapiko at pagsikip ng kalsada. Sapagkat dadami ang kita ng mga tao bilang empleyo mula sa mina ay maaring dumami rin ang magnanais bumili ng sasakyan gaya ng motorsiklo.

Pagtaas ng antas ng Wireless Communication

Para sa mga local, ang Internet/phone signal ay napakahina. Sa barangay Bayanihan, kailangan mo pumunta sa kabundukan upang makasagap ng signal. Bagamat mahina, mayroon signal sa barangays Bacong, Mamawan and Pitawe.

Ang conventional na two- way radio ang higit na ginagamit sa Gutalac. Kapag may mina, maari gumanda ang antas ang wireless communication.

Kapayapaan

Masasabi na tahimik ang Gutalac. Mayroon 10:00pm curfew at ang paggamit ng videoke machines ay hanggang 10:00pm lamang. Kapag may mina, dadami ang trabahador at magdudulot ng petty local neighborhood disorder gaya ng mga lasing at maliliit na away. Maari din na tumaas ang ingay mula sa mga local entertainments gaya ng beerhouse at night clubs.

Pagdami ng dayuhan

Ang populasyon ng mga barangay sa Gutalac ay mababa. Kapag may mina, dadami ang dayuhan na interesado magtrabaho dito. Maari na magkaroon ng local feuds mula sa mga pagkakaibang social character at ugali or behavior ng mga dayuhan at local ng Gutalac.

Trapiko

Walang naitalang trapiko sa kalsada sa Gotalac. Kapag may mina, gaganda ang kalsada, dadami ang sasakyan pati na ang posibleng aksidente sa kalsada. Dahil sa pagtaas ng kita ng mg tao, dadami din ang magnanais bumili ng sasakyan.

Kultura at anyo ng pamumuhay

Sa ngayon, ang mga local ang Gotalac ay masasabing mayroong simple, masaya, at kuntento sa buhay. Halos lahat sila ay engaged sa farming at fishing. Kapag may mina, tataas ang ang kita pati na ang antas ng pamumuhay ng mga local. Kasama dito ang pagdami ng bagong trabaho at Negosyo sa Gotalac.

Sagradong lugar /Tribal Grounds

Walang nakitang sagradong lugar or sacred grounds nor archeological importance maliban sa lugar na malapit sa barangay Bayanihan, kung tawagin ay Monalisa. May ilan nagsabi mayroon ancestral domain (diumano) sa barangay, subalit, mayroon din nagsasabi na ito ay walang katotohanan ayon sa isang religious leader.

Pagsuri sa mga Pangangailangan

Sa pangkalahatan resulta ng pagsanguni gamit ang FGD, nagkakaisa ang mga local na unahin ang infrastructure development gaya ng construction/rehabilitation ng kalsada. Sapagkat delikado ang mahaba, matagal, at mapanganib na kalagayan ng mga kalsada sa mga barangay ng Gotalac na pahirap sa mga residente sa malayong lugar.

Mayroon din nagmungkahi na livelihood projects at came as the next area of concern/focus. Most residents in the barangays need more access to sources of income at alternative income option.

Sa kalikasan, nagmungkahi na iwasan ang destruction of forest, pollution of water sources degradation of marine/river upang maiwasan din ang epekto sa mga livelihood mula sa farming at fishing. Nais din nila magkaroon ng access sa health and education.

Panghuli, ayusin ang barangay roads upang makatulong sa pang-araw-araw ng Gawain ng mga local patungo sa ibang lugar at karatig barangay.

Inaasahan sa proyekto

Nakalista ang ibat ibang inaasahan ng mga local mula sa mina. Ilan dito ay new construction and maintenance of barangay roads, provision of clinics, hospital and medical assistance, prioritization of locals for work, educational assistance and scholarship, tribal houses for IPs, school buildings, and finally a responsible mining practices to name a few.

Pangako sa Komunidad

Ang mga inaasahan ng local sa mga pangako ng mina ay ang sumusunod: maintenance of hygiene, proper waste disposal, waste segregation and recycling, planting of trees, strict implementation of Bantay Kalikasan, maintenance of a peaceful, orderly and quiet life, practice of good manners and respect among barangay residents and compliance to barangay and municipal ordinances.

E.S. 3.2 Buod ng Pagsuri ng alternatibo

E.S. 3.2.1 Pagpili ng lugar

Ang mina ay tinatawag na very site specific sapagkat meron lamang lugar ng mina na may economic ore deposits.

Walang nakikitang alternatibong lugar ang FMDC, i.e., Parcel 2 sapagkat mayroon na itong economic feasibility and marketability of the ore outside the Philippines.

E.S. 3.2.2 Paraan ng pag mina

Sapagkat ang nickel deposit ay laterite at nsa highly weathered ultramafic rocks, wala ibang paraan or other mining method na effective in optimizing the return of investment kung hindi ang strip or contour mining method. Kasama dito ang Progressive Mining Rehabilitation upang mapangalagaan ang surrounding environment, i.e., Bacong.

E.S. 3.2.3 Kontrol sa Polyusyon

Sapagkat hindi maiwasan ang epekto sa hangin, tubig, lupa, tao mula sa surface mining operation, ang FMDC ay gagawa ng lahat ng paraan upang makontrol or control and mitigate dust and noise pollution. Kailangan magkaroon ng edukasyon ang lahat ng staff at empleyado kasama ang locals upang maintindihan ang kahalagahan ng managing the pollution. Makakatulong ito sa pagkakaroon ng environmental integrity sa mine site at protection of territories ng communities.

E.S. 3.2.4 Power Supply

Ang pangangailangan sa kuryente ng mine camps at iba pang logistical requirements ng operations ay manggagaling sa Zamboanga Del Norte Electrical Cooperative (ZANECO). May kakayahan ito magbigay ng supply sapagkat meron recorded peak demand of 39.08MW noong 2017 at tinatayang tataas sa 50.79MW sa 2024.

Ang power load center ng ZANECO ay nasa Liloy town, karatig ng Gutalac, at nangangahyulugan na mayroon sufficient supply ng kuryente para sa mine operation.

Sa pahahon ng mine construction phase, mayroon standby generator sets na gagamitin para sa kuryente ng mga temporary activities. Ang gensets ay siya ring magiging backup power supply sa pahanon na walang supply ang ZANECO.

E.S. 3.2.5 Water supply

Ang supply ng tubig sa minahan para sa domestic ay maaring manggaling sa kalapit na sapa or nearby natural drainage/creek nasa hilagang silangan ng site (Parcel 2). Sa operations ng mina gamit ang mining/extraction ng nickel ore, ang gamit ng tubig are maliit lamang, approx. 80,000 liters kadaa araw. Ang paggamit ng sapa or nearby creek para sa water supply ay mangangailangan ng water rights permit mula sa National Water Resources Board (NWRB). Ang iba pang tubig mula sa sapa or creek ay gagamitin sa pagsugpo ng fugitive dust control, water plantation/nurseries, equipment maintenance, fire-fighting, and non-contact use.

Maraming supply ng free-flowing sources mula sa mga bukal or springs sa itaas ng bundok at malinis para inuming gamit sa loob ng campsite.

E.S. 3.2.6 Iskedyul or Timeframe

Table 0-1 Project Timeline - Gantt Chart

ACTIVITY	YEAR 1				YEAR 2				YEAR 3				YEAR 4				YEAR 5				YEAR 6				YEAR 7			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Hiring of Personnel	➡	➡																										
Conversion to MPSA	➡	➡																										
FPIC (Mine Operations)	➡	➡																										
Construction of Basecamp and Other Facilities	➡	➡	➡	➡																								
Construction of Jetty			➡	➡																								
Construction of Haul Road			➡	➡																								
Installation of Drainage/Environmental Structures			➡	➡			➡	➡			➡	➡			➡	➡			➡	➡			➡	➡				
Clearing/Grubbing			➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡
Construction of Stockyard			➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡
Stripping of Top Soil			➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡
Mining			➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡
Stockpiling of Ore			➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡
Hauling of Ore			➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡
Shipping			➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡
Progressive Rehabilitation			➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡	➡
Maintenance of Structures			➡	➡			➡	➡			➡	➡			➡	➡			➡	➡			➡	➡			➡	➡
Decommissioning																											➡	➡

E.S. 3.2.7 Mga Bahagi ng Proyekto

Ang sukat or laki at kapasidad ng proyekto ay makikita sa ibaba:

Table 0-2 Sukat at kaukulang permiso ng proyekto

Project Components	Tenurial Instruments	Area/Capacity/Specs.
Mining Areas	EP-010-2022-IX (Parcel 2)	81 ha
Stockpile Areas at the Mining Areas		14 ha/ 700,000 m3 cap.
•High-Grade		2 ha/ 100,000 m3 cap.
•Marginal-Grade		2 ha/ 100,000 m3 cap.
•Low-Grade		4 ha/ 200,000 m3 cap.
•Topsoil		2 ha/100,000 m3 cap
Waste Dumps		4 ha/ 200,000 m3 cap.
Mining Contractors' Equipment/Motor Pool	MLA	0.5 ha
Camp Site/Mine Office & Nursery	SLUP/EP 11	2.62 ha
•Offices		840 m ²
•Warehouse		391 m ²
•Core House		484.35 m ²
•Fuel Depot		500,000 liters capacity
•Assay Laboratory		403.44 m ²
•Staff and Guest Houses		1380 m ²
•Recreation Area		1270 m ²
Pier Facilities/Causeway	MLA	100.00 m from the shoreline
•Port Stockyard		0.01 ha
•Multipurpose Shed with Amenities		0.03 ha
•Fuel Depot		500,000-liter capacity diesel
•Security House		about 2,000 sq. meters
Stockyards & Drying Areas at the Port	EP 11	12.00 ha
•Solar/Wind Drying Pad		3.9 ha

Project Components	Tenurial Instruments	Area/Capacity/Specs.
•Ore Stockyard		5.00 ha
•Dry Ore Stockpile Area		3.00 ha
•Equipment Service Area	MLA/EP 11	0.1 ha
Road Networks	EP 11/EP 10	10.00 ha
•Haul Roads (from Mining Area to Port)		15 m W x 4 km L
•Brgy. Road (from Mining Area to Bacong)		12 m W x 2.5 km L
•Access Roads		6 m W x 5 km L
o Camp Site to Mining Area		15 m W x 6 km L
o Internal		
Ancillary Facilities		4.50 ha
•Power Supply	SLUP/ EP 11	
o Generator Set		Two 200KVA for laboratory and 3 15KVA for small requirements such as pumps and lighting
o Power House (at the Base Camp)		
•Water Supply (springs)	EP 11	approximately 80,000 liters per day for 400 personnel (approx. 15GPM)
Pollution Control Structures/Facilities/Devices	EP 10/MLA	
•Siltation Ponds		1.2ha / 28000m3 - 56000 m3 cap.
•Waste Dumps		100,000 cubic meters
•Topsoil Stockpile		100,000 cubic meters
•Nursery	SLUP/EP 11	900 m ²
•Oil-Water Separators		one unit
•Materials Recovery Facility		40 m ²
•Hazardous Waste Storage Facility		40 m ²
•Septic Tanks		At 50 gallons per person, approximately 4 septic tanks with 18.9 cubic meter capacity
Total Area Application for ECC		114.50 ha

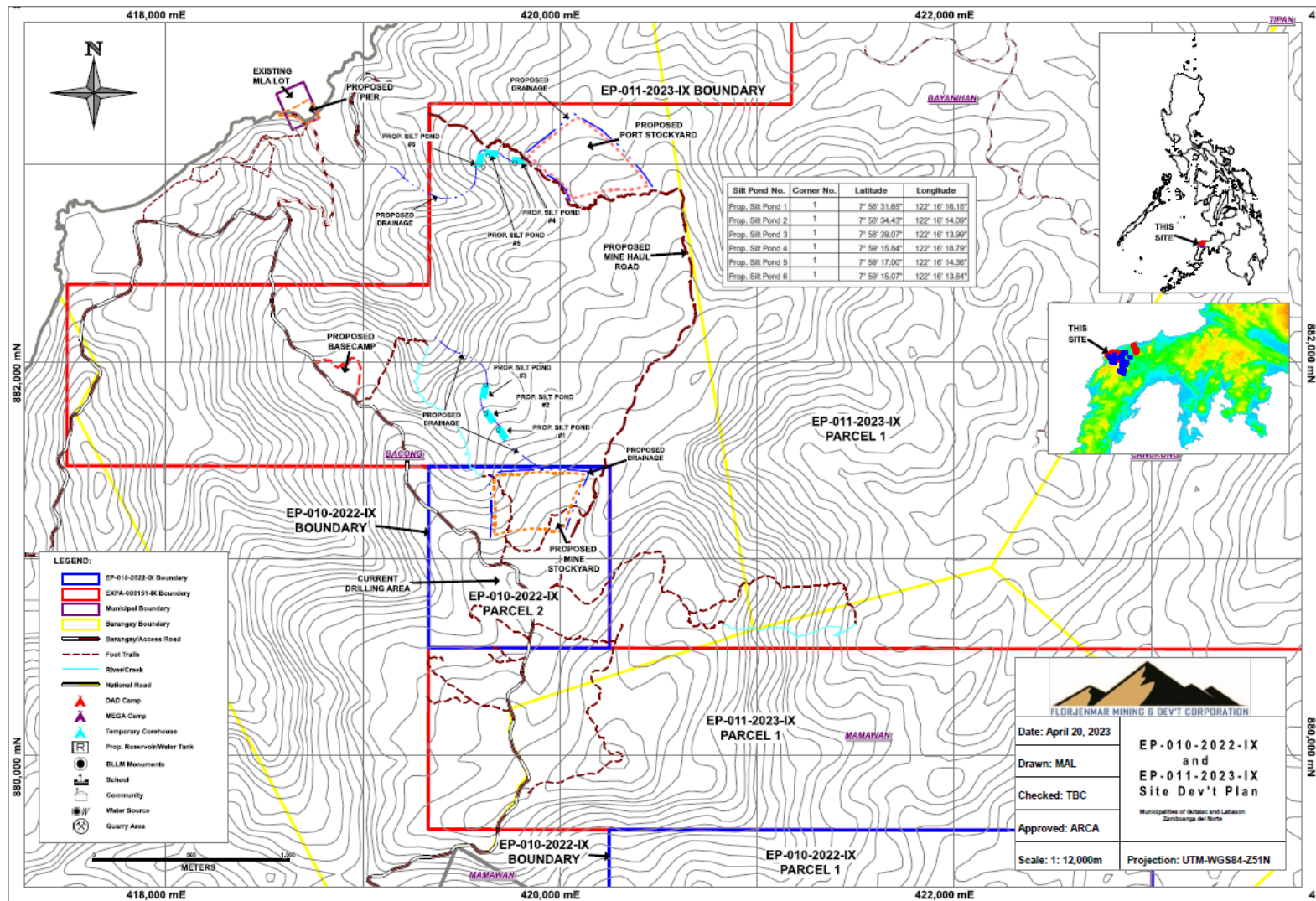


Figure 0-1 Project Components Map

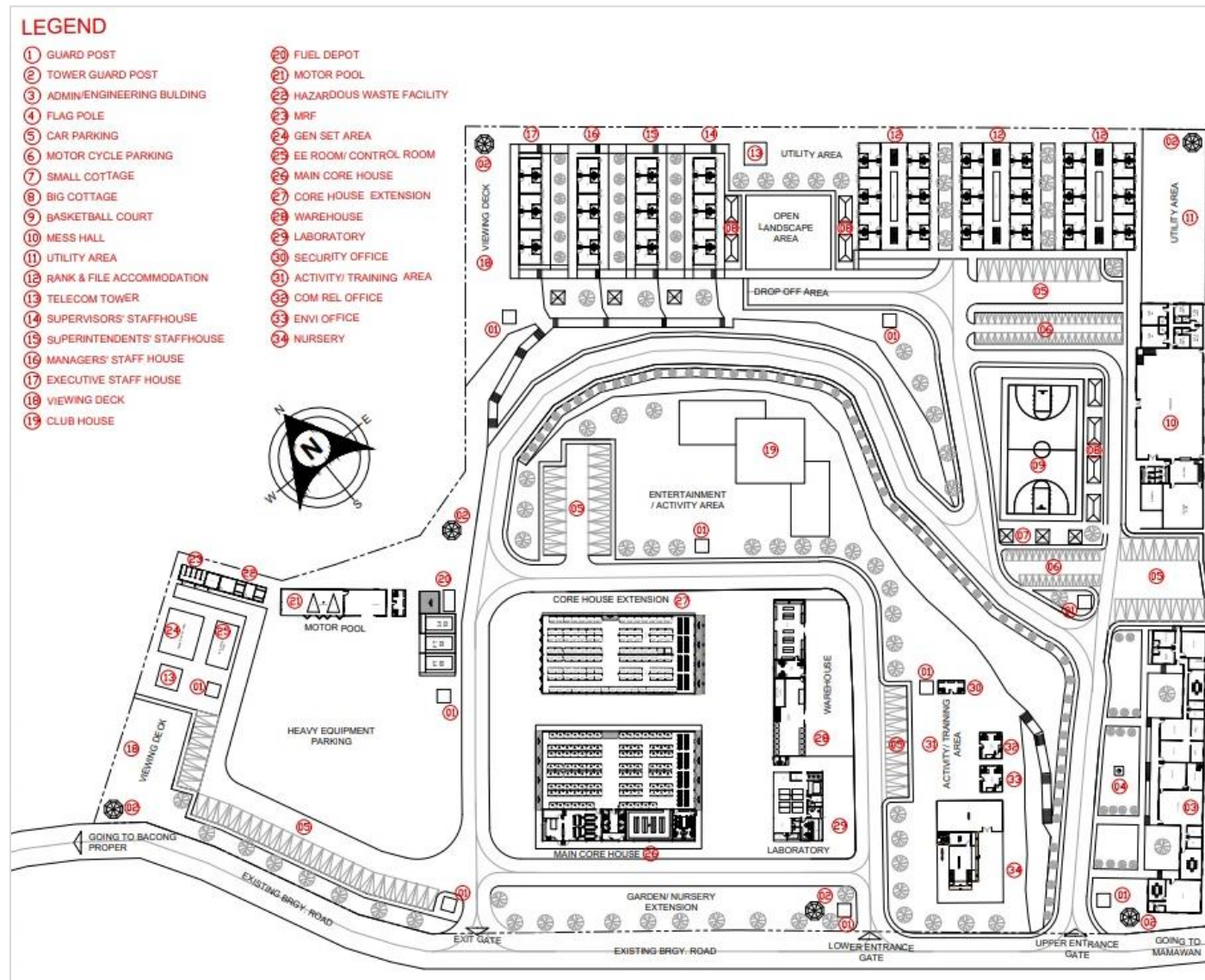


Figure 0-2 Camp Site with major components

1.1.1 Support Components

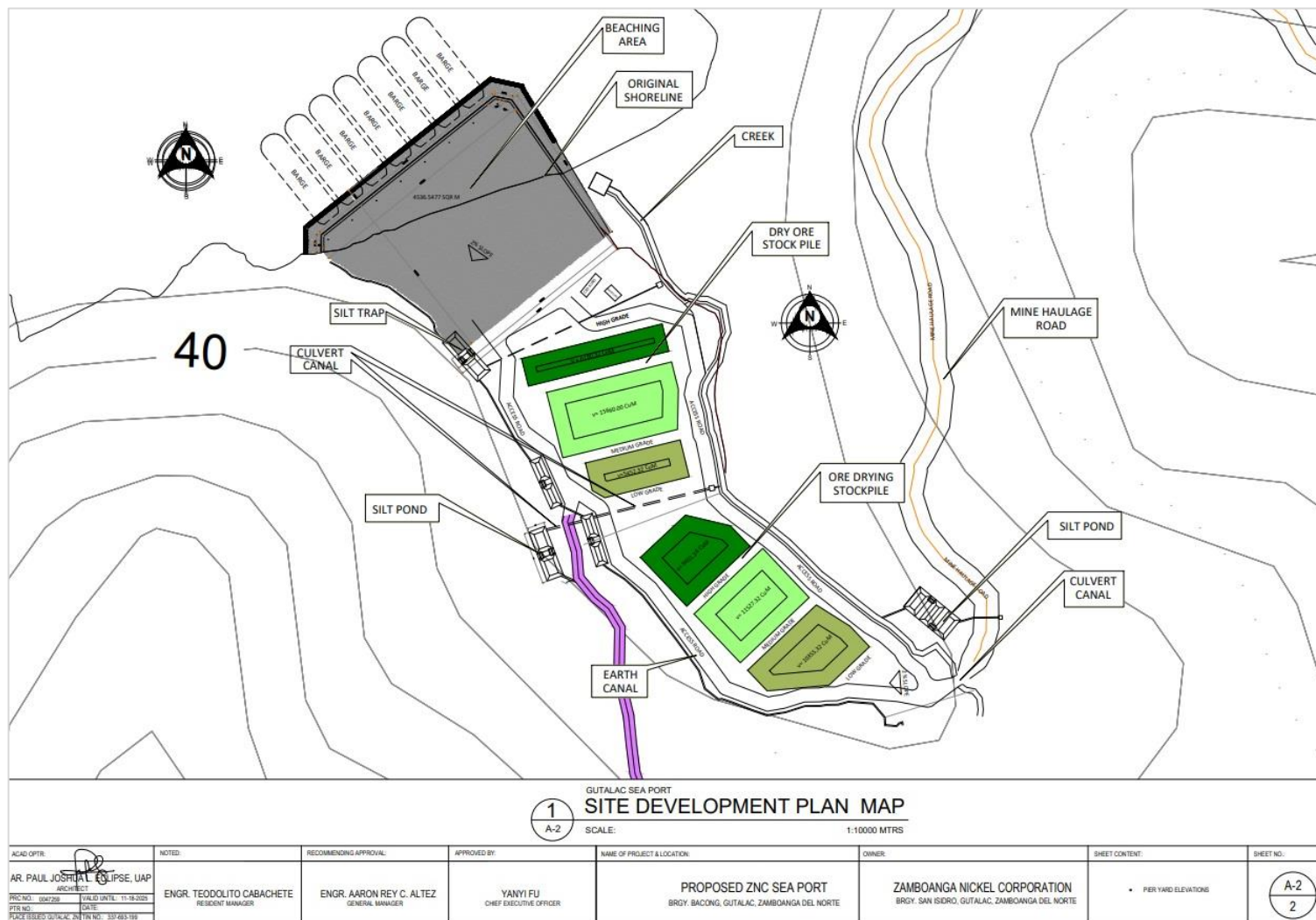


Figure 0-3 Site Development Plan for Seaport

E.S. 3.3 Buod na epekto ng mina at mga maiiwan na pinsala nito

Buod ng pagaaral ng epekto at mekanismo upang mabawasan ito ay nakalista sa Table sa ibaba:

Table E.S.- 10 Buod ng epekto ng mina at pamaraan upang mabawasan ito

Project Activities	Environmental components likely to be affected	Potential Impacts	Proposed Mitigating Measures	Target Performance/ Efficiency	Responsible Entity	Cost Allocation	Guarantee or Financial Agreements
Construction Phase							
Site Preparation and Clearing. Construction of Mine Infrastructure Pre-Stripping Activities at the Surface Mine Area	Land	Vegetation Removal and Loss of Faunal Habitat.	Vegetation Removal and Loss of Limiting the Area of Disturbance to cover only the Planned Area for Development. Earth Balling of significant species prior to land grubbing and translocation as enrichment planting materials in the identified reference ecosystem. Wildlings collection from the areas targeted to be stripped and set aside in established nurseries for future rehabilitation. Seeds are collected from native trees within the applied MPSA for propagation in the nurseries;	>90%	FMDC	Construction and Project Development Cost.	Part of the Operating Cost Management of Design and Construction of Facilities in Accordance with DAO 2010- 21: Consolidated Department Orders for the Implementing Rules and Regulation of RA 7942: Philippine Mining Act of 1995. Compliance to DAO 2022-04 Enhancing Biodiversity Conservation and Protection in Mining Operations.
		Loss of Topsoil and Overburden Materials.	Removed Topsoil to be Stockpiled for Progressive Rehabilitation Activities. Management and Control of the Topsoil Storage Areas. The fertility of the soil will degrade over time and may need to be	>90%	FMDC	Construction and Project Development Cost.	Part of the Operating Cost Management of Design and Construction of Facilities in Accordance with DAO 2010- 21: Consolidated Department Orders for the Implementing Rules and

Project Activities	Environmental components likely to be affected	Potential Impacts	Proposed Mitigating Measures	Target Performance/ Efficiency	Responsible Entity	Cost Allocation	Guarantee or Financial Agreements
			enhanced with soil conditioning or fertilizers.				Regulation of RA 7942: Philippine Mining Act of 1995.
		Decrease Carbon Pool in the area which that has the capacity to accumulate or carbon	Establishment of Forest Carbon Project Identification of reference ecosystem which is 5% of the applied MPSA area	>90%	FMDC	EPEP Cost	Compliance to DAO 2022-02: Guidelines on the Establishment of Carbon Accounting, Verification, and Certification System (CAVS) for forest carbon project. Compliance to DAO 2022-04 Enhancing Biodiversity Conservation and Protection in Mining Operations.
		Increase Greenhouse Gas Emissions	Establishment of Forest Carbon Project Identification of reference ecosystem which is 5% of the applied MPSA area	>90%	FMDC	EPEP Cost	Compliance to DAO 2022-02: Guidelines on the Establishment of Carbon Accounting, Verification, and Certification System (CAVS) for forest carbon project. Compliance to DAO 2022-04 Enhancing Biodiversity Conservation and Protection in Mining Operations.

Project Activities	Environmental components likely to be affected	Potential Impacts	Proposed Mitigating Measures	Target Performance/ Efficiency	Responsible Entity	Cost Allocation	Guarantee or Financial Agreements
		Threat to Existence of Important Local Species.	Wildlings of Important (Critically Endangered, Endangered and Vulnerable) Floral Species will be Collected Prior to Disturbance and will be Maintained at the Plant Nursery Until Ready for Planting Within Planned Rehabilitation Areas.	100%	FMDC	P8 per seedling; annual target collection is P25,00 or a total cost of P2 million over the span of 10 years	EPEP Cost Compliance to DAO 2022-04 Enhancing Biodiversity Conservation and Protection in Mining Operations.
		Threat to Abundance, Frequency and Distribution of Important Local Species.	Identification Reference Ecosystem which is 5% of the applied MPSA area.				
		Change in Surface Topography.	Progressive Rehab of disturbed areas by placement of soil cover, soil conditioning and vegetative cover Use of fast-growing tree species and intercropped with endemic species and cash crops for livelihood Identification Reference Ecosystem which is 5% of the applied MPSA area. Hiring of Biodiversity Conservation Officer to lead the integration of biodiversity measures in various stages of mining operations.	>90%	FMDC		EPEP Cost Compliance to DAO 2022-04 Enhancing Biodiversity Conservation and Protection in Mining Operations.
		Change in Soil Quality due to improper	Proper Storage and Disposal of Waste Materials (Hazardous and Non-Hazardous) Within Designated Areas (MRF for Solid	>90%	FMDC	Construction and Project Development Cost.	Part of the Operating Cost Management of Waste Materials as Required by DAO 2013-22. Revised

Project Activities	Environmental components likely to be affected	Potential Impacts	Proposed Mitigating Measures	Target Performance/ Efficiency	Responsible Entity	Cost Allocation	Guarantee or Financial Agreements
		management of wastes	Waste and HWSF for Hazardous Waste)				Implementing Rules and Regulations of RA 6969: Toxic Substances and Hazardous Wastes and Nuclear Substances Control Act.
		Soil Erosion	Steep Slopes (>30°) Will Require Benches, Terraces or Other Slope Controls to Reduce Surface Water Runoff Velocity During Rainfall Events. Other Surface Treatment to Control Erosion.	>90%	FMDC	Construction and Project Development Cost.	Use of Reputable and Experienced Engineering Design Consultants for Facility Design and Construction.
		Contamination of Soils from Oil and Fuel Leaks from Construction Equipment Use	Storage and Work Areas shall be Provided with Secondary Containment for Collection of Fuel and Oil Leaks. Regular Maintenance of Construction Equipment.	100%	FMDC	Construction and Project Development Cost.	Management of Waste Materials as Required by DAO 2013-22: Revised Implementing Rules and Regulations of RA 6969: Toxic Substances and Hazardous Wastes and Nuclear Substances Control Act.
	Air	Dust Generation from Movement of Equipment During Clearing and Construction Activities	Use of Dust Suppression Techniques such as Watering of Exposed Surfaces, Reduction of Vehicle Travel Speeds and Limit Exposed Areas.	100%	FMDC	Construction and Project Development Cost.	Conformance with DAO 2000-81: Implementing Rules and Regulations of RA 8749: Philippine Clean Air Act. Conformance with DAO 2010-01: Implementing Rules and Regulations of RA 9729: Climate Change Act.
	Water	Sedimentation and Siltation Local Rivers and Creeks.	Provision of Buffer Zones between the Areas of Disturbance and Rivers and Creeks.	>90%	FMDC	Construction and Project Development Cost.	EPEP Cost
		Increased Turbidity Levels within Local Rivers and Creeks	Operations Involving Soil Disturbance, Such as Overburden Stripping, to Incorporate a Buffer Zone of at Least 20 Meters Away from Creeks and Rivers.				Compliance with DAO 2016-008: Water Quality Guidelines and General Effluent Standard and DAO 2021-19: Updated Water Quality Guidelines and General Effluent Standard for Selected Parameters

Project Activities	Environmental components likely to be affected	Potential Impacts	Proposed Mitigating Measures	Target Performance/ Efficiency	Responsible Entity	Cost Allocation	Guarantee or Financial Agreements
			Establish Erosion Control Measures Including Diversion Canals, Soil Stabilization Programs and Re-Vegetation of Disturbed Areas to Reduce the Soil Loss Potential. Construction of Sediment Ponds and Overland Flow Retention Structures to Trap Soil and Reduce Siltation.				
		Changes in Drainage Patterns.	Develop Master Infrastructure Drainage Plan for the Project Area.	>90%	FMDC	Construction and Project Development Cost.	EPEP Cost
		Changes in Flood Characteristics.	Provision of stormwater drainage system	>90%	FMDC	Construction and Project Development Cost.	Environmental Protection and Enhancement Program.
		Loss of Riparian and Aquatic Habitat Areas.	Provision of siltation ponds	>90%	FMDC	Construction and Project Development Cost.	Environmental Protection and Enhancement Program.
		Water Quality Degradation due to Potential Leaks or Spills of Oils and Fuels.	Storage and Work Areas shall be Provided with Secondary Containment for Collection of Fuel and Oil Leaks. Regular Maintenance of Construction Equipment.	100%	FMDC	Construction and Project Development Cost.	Environmental Protection and Enhancement Program. Compliance with DAO 2016-008: Water Quality Guidelines and General Effluent Standard and DAO 2021-19: Updated Water Quality Guidelines and General Effluent Standard for Selected Parameters
	People	Occupational health and safety hazards	Proper training of personnel	100%	FMDC	Construction and Project	Compliance to DAO 2000-08

Project Activities	Environmental components likely to be affected	Potential Impacts	Proposed Mitigating Measures	Target Performance/ Efficiency	Responsible Entity	Cost Allocation	Guarantee or Financial Agreements
			Use only heavy equipment operators with certifications Daily safety meetings, tool meetings, and strict adherence to all safety rules and regulations			Development Cost.	
		Generation of employment from the local population	Assist the local governments (particularly at the municipal and provincial levels) to develop and to assist their respective Public Employment Services Offices (PESOs). Institute a system of verification regarding local residency in respect to hiring; Training programs for required skills for residents of host communities; and Training programs for local governments on revenue generation and management.	>90%	FMDC	Construction and Project Development Cost.	Compliance to the Labor Code of the Philippines.
Operation Phase							
Mining Operation. Extraction of Ore	Land	Loss of Topsoil and Overburden Materials.	Establishment of Benches in Accordance with the Surface Mine Design.	>90%	FMDC	Project Operation Cost. AEPEP Cost.	This is Included in the Annual Environmental Protection and Enhancement Program (AEPEP).

Project Activities	Environmental components likely to be affected	Potential Impacts	Proposed Mitigating Measures	Target Performance/ Efficiency	Responsible Entity	Cost Allocation	Guarantee or Financial Agreements
		Change in Land Use of the Surface Mine Area.	Ensure that the land use plan reflects the changes that will be done to the land Progressive rehabilitation in order to make mined out areas reusable again. Establishment of Forest Carbon Project Identification of reference ecosystem which is 5% of the applied MPSA area	>90%	FMDC	Project Operation Cost. AEPEP Cost.	This is Included in the Annual Environmental Protection and Enhancement Program (AEPEP). Compliance to DAO 2022-02: Guidelines on the Establishment of Carbon Accounting, Verification, and Certification System (CAVS) for forest carbon project. Compliance to DAO 2022-04 Enhancing Biodiversity Conservation and Protection in Mining Operations.
		Increased Soil Erosion	Installation of Drainage Canal System to Prevent Erosion of Benches and Other Areas.	>90%	FMDC	Project Operation Cost. AEPEP Cost.	The Program will be Reviewed and Approved by the MRFC, and Monitored by the MMT.
		Reduction in Soil Fertility.	No plants in the mine site while the mine is operating. Topsoil will be stored, used as vegetable garden, and reused once the area is mined out during progressive rehabilitation	>90%	FMDC	Project Operation Cost. AEPEP Cost.	Third Party Monitoring Every 1 to 2 years as Required by the ECC.
		Climate Change Contribution from the Removal of Vegetation	Progressive Rehabilitation of Disturbed Areas by Placement of Soil Cover, Soil Conditioning and Vegetative Cover Placement. Vegetative Cover Will Include Fast Growing Species Intercropped with Cash Crops and Endemic Species.	>90%	FMDC	Project Operation Cost. AEPEP Cost.	This is Included in the Annual Environmental Protection and Enhancement Program (AEPEP).

Project Activities	Environmental components likely to be affected	Potential Impacts	Proposed Mitigating Measures	Target Performance/ Efficiency	Responsible Entity	Cost Allocation	Guarantee or Financial Agreements
		Change in Surface Topography, Terrain and Land Slope	Progressive Rehabilitation of Disturbed Areas by Placement of Soil Cover, Soil Conditioning and Vegetative Cover Placement. Vegetative Cover Will Include Fast Growing Species Intercropped with Cash Crops and Endemic Species.	>90%	FMDC	Project Operation Cost. AEPEP Cost.	This is Included in the Annual Environmental Protection and Enhancement Program (AEPEP).
		Threat to Existence of Important Local Species. Threat to Abundance, Frequency and Distribution of Important Local Species.	Progressive Rehabilitation of Disturbed Areas by Placement of Soil Cover, Soil Conditioning and Vegetative Cover Placement. Vegetative Cover Will Include Fast Growing Species Intercropped with Cash Crops and Endemic Species. Minimize Vegetation Removal within Project Facility Areas Planned for Development. Increase Ground Cover by Reforestation with Local Important Species. Collection of wildlings of Endangered and Endemic Floral Species for Propagation in the Plant Nursery. Prepare a Biodiversity Management Plan. Maintain Forest Corridors for Wildlife Movement.	>90%	FMDC	Project Operation Cost. AEPEP Cost.	This is Included in the Annual Environmental Protection and Enhancement Program (AEPEP). Third Party Monitoring Every 1 to 2 years as Required by the ECC.

Project Activities	Environmental components likely to be affected	Potential Impacts	Proposed Mitigating Measures	Target Performance/ Efficiency	Responsible Entity	Cost Allocation	Guarantee or Financial Agreements
	Water	Leaching of Metals to Surface Water Runoff and Potential Generation of Acid Mine Drainage.	Conduct Water Quality Monitoring and Assessment of Mine Surface Water Runoff on a Regular Basis. Construction of Passive Wetland Treatment Facilities, if necessary, for Natural Treatment of Surface Water Runoff. Conduct Groundwater Sampling and Water Quality Monitoring on a Regular Basis.	100% Results of water quality monitoring are within the DENR Standards.	FMDC through the Environmental Management Department.	Project Operation Cost. AEPEP Cost.	Quarterly Review and Monitoring of the MMT. Third Party Monitoring as Required by the ECC.
		Potential petroleum leaks	Construction of Fuel Farm complete with sufficient secondary containment bunds which can 120% of the total capacity of the fuel tanks and provision of oil spill contingency plan Oil spills containment through bunds, drip trays, and oil-water separators	100%	FMDC through the Environmental Management Department	Project Operation Cost. AEPEP Cost.	Environmental Protection and Enhancement Program. Compliance with DAO 2016-008: Water Quality Guidelines and General Effluent Standard and DAO 2021-19: Updated Water Quality Guidelines and General Effluent Standard for Selected Parameters
	Air	Dust Generation from Movement of Trucks During Hauling Operations and Heavy Equipment During Excavation and Loading Operations.	Use of Dust Suppression Techniques such as Watering of Exposed Surfaces, Reduction of Vehicle Travel Speeds and Limit Exposed Areas. Provision of Personal Protective Equipment. Conduct of TSP, PM10 measurement as would be	100% Ambient air quality monitoring results are within the DENR Standards.	Proponent through Mines, Safety and Environmental Management Departments.	AEPEP Cost. Safety Operational Cost.	This is included in the Annual Environmental Protection and Enhancement Program (AEPEP) of the company that will be reviewed and approved by the MRFC, and monitored by the MMT. Third Party Monitoring as Required by the ECC.

Project Activities	Environmental components likely to be affected	Potential Impacts	Proposed Mitigating Measures	Target Performance/ Efficiency	Responsible Entity	Cost Allocation	Guarantee or Financial Agreements
		Human Health Impacts within High Dust Production Areas.	Included in the Annual Ambient Air Quality Monitoring. Timely Progressive Rehabilitation Activities for Areas No Longer Part of Construction or Not Needed for Operations.				
Use of Resources.	Water.	Use of Surface Water Sources for Domestic and Industrial supply. Resource Competition with Downstream Users and Reduction in Stream Flows Due to Diversions.	Implementation of Recycling Programs, Improvements Within Operations to Minimize Water Use. Establishment of Other Water Conservation Measures to be Implemented by FMDC and Individual Employees. Preparation and Implementation of a Water Resource and Watershed Management Plan.	>90%	FMDC through the Department Managers. Environment and Civil Engineering Services Departments.	Operations Cost. Environmental Management Department and Civil Engineering Services Departments.	Cost Savings and Economic Benefits from Recycling and Conservation Measures. Conditions Identified in the National Water Resources Board Water Permit.
Generation of Hazardous and Non-Hazardous Wastes.	Land	Potential Soil Contamination, Change in Soil Quality, Arising from Accidental Spills or Leaks	Provision of Bund Walls to Contain at Least 110% the Capacity of the Largest Storage Tank, in the Case of a Spill, Leak or Process Area Washing. Regular Inspection of Storage Tanks, Containers, Pipe Lines for Signs of Leaks, Corrosion, Structural Instability, Malfunctioning Valves and Fittings.	>90%	FMDC	Operations Cost. AEPEP Cost.	Included in the ASHMP. Bund Walls and Secondary Containment will be Included in the Design. Transport and Disposal of Hazardous Wastes will be Done Only with a Valid Permit to Transport and Hazardous Waste Manifest. A Certificate of Treatment will be Issued by the Contractor.
		Generation of Hazardous Wastes such as Acids, Bases, Spent Oils,	Hazardous Wastes will be Labeled and Stored According to the Regulatory Guidelines and Protocols. Transport and Disposal	100%	Proponent through Environmental		

Project Activities	Environmental components likely to be affected	Potential Impacts	Proposed Mitigating Measures	Target Performance/ Efficiency	Responsible Entity	Cost Allocation	Guarantee or Financial Agreements
		and Chemical Contaminated Containers.	will be through Accredited and Licensed Hazardous Waste Management Contractors.		Management Department.		
	Water	Potential Surface Water Contamination and Degradation of Surface Water Quality due to Accidental Spills or Leaks.	Provision of Bund Walls within Chemicals and Reagent Storage Areas to Contain Releases and Minimize Pathways to the Environment During Occurrences of Spill or Leaks. Establish Surface Water Monitoring Program to Collect and Test Samples on a Regular Basis.	>90% Results of surface water monitoring are within DENR standards	FMDC	AEPEP Cost Third Party Monitoring and Testing Consultants.	Monitoring program included in the AEPEP. Laboratory Results of the Monitoring Program are Reported to Government Agencies through the Self-Monitoring Report (SMR), MMT Quarterly Inspection, MRFC Quarterly Meetings. Non-Compliance May Lead to a Notice of Violation.
		Potential Groundwater Contamination and Degradation due to Oils and Fuels from Accidental Releases.	Establish a Groundwater Monitoring Program to Collect and Test Groundwater Samples on a Regular Basis.	100% Results of groundwater monitoring are within PNSDW standards.	FMDC through the Environmental Management Department.	AEPEP Cost Third Party Monitoring and Testing Consultants.	Monitoring program included in the AEPEP. Laboratory Results of the Monitoring Program are Reported to Government Agencies through the Self-Monitoring Report (SMR), MMT Quarterly Inspection, MRFC Quarterly Meetings. Non-Compliance May Lead to a Notice of Violation
		Release of Chemicals and Reagents Due to Drainage System Failure.	Develop Drainage and Surface Water Control Plan to Contain Contaminated Surface Water and Manage Hazardous and Non-Hazardous Storage and Containment Areas. Preparation of Site Remediation Plan for Occurrences of Surface and Groundwater of Contamination and Soil Contamination.	>90%	Third Party Monitoring and Audit Programs.	AEPEP Cost	FMDC Safety Department Protocols and Emergency Response Plan.
	Air Quality and Noise	Generation of Noise and Air Emissions	Air pollution control devices and proper maintenance	>90%	Third Party Monitoring and	AEPEP Cost.	Maintain Compliance with DAO 2000-8: A 8749:

Project Activities	Environmental components likely to be affected	Potential Impacts	Proposed Mitigating Measures	Target Performance/ Efficiency	Responsible Entity	Cost Allocation	Guarantee or Financial Agreements
		from the Use of Generator Sets and vehicles		Results of Ambient Air Quality are within the DENR standards	Audit Programs.	Third Party Monitoring and Testing Consultants.	Implementing Rules and Regulations of Clean Air Act.
	People	Health and Safety Risks from Use, Handling, Storage and Disposal of Chemicals and Reagents.	Provision of Personal Protective Equipment to Employees. Employee Orientation of the Material Safety Data Sheets. Education and Implementation of Proper Handling, Storage and Disposal Protocols.	100%	FMDC through the Safety Department.	Safety and Health	Maintain Compliance with DAO 2000-8: and RA 6969
Site Operations and Maintenance	Land	Generation and Disposal of Solid Wastes.	Development of Solid Waste Management (i.e., Reduction, Reuse, Recycling Activities) Program Activities for Company Wide Implementation Including FMDC Operations and Contractor Operations. Construction of Solid Waste Management Facility and Engineered Septage Facility for Appropriate Storage of Generated Wastes. IEC Programs on Solid Waste Management for both Hazardous and Non-Hazardous Waste Materials.	>90%	FMDC through Company Wide Commitments and Environmental Management Department.	Operations Cost and Environmental Department Cost. AEPEP Cost.	Establish Compliance with RA 9003: Ecological Solid Waste Management Act.
	Water	Reduction or Depletion of Local	Implement Water Recycling and Conservation Programs.	>90%	FMDC through Company	Operations Cost and	Cost Savings from the Recycling Activities.

Project Activities	Environmental components likely to be affected	Potential Impacts	Proposed Mitigating Measures	Target Performance/ Efficiency	Responsible Entity	Cost Allocation	Guarantee or Financial Agreements
		Water Resource Supply.	Prepare and Monitor Water Balance Data to Determine Input and Output Requirements in the Process Operation and Determine Areas for Potential Water Conservation Measures. IEC Programs for Water Use and Water Conservation.		Wide Commitments and Environmental Management Department.	Environmental Management Department Cost. AEPEP Cost.	Compliance with the Approved National Water Resource Board Water Rights Permit.
Storm water Management	Water	Increased Sedimentation and Siltation of Downstream Rivers and Creeks. Potential downstream flooding.	Development of overall Drainage Plan to balance volume flow of water within the Project site. Natural drainage features and patterns in undisturbed areas will be retained. Identification of areas with high risk of erosion in order to divert or reduce runoff through that area. Construction of diversion and drainage canals. Installation of cross drainage or culverts. Landscaping and reforestation of exposed areas to reduce water runoff volume.	>90%	FMDC through Civil Engineering, Mines and Environment Department	Mine Operations, Civil Engineering and Environmental Management Department Cost	Included as part of AEPEP.
Abandonment/Decommissioning							
Decommissioning Activities. Disposal of Equipment and Scrap Materials.	Land	Soil Contamination from Equipment Removal. Stability of the Tailings Storage	The Majority of the Impacts During Closure will have been Addressed and Reduced by Progressive Rehabilitation Activities Implemented During the Operations Phase. Similar	100%	FMDC through all Department Managers.	Costs Identified in the Final Mine Rehabilitation and	Addressed in the Final Mine Rehabilitation and Decommissioning Plan Reviewed and Approved by the CLRF.

Project Activities	Environmental components likely to be affected	Potential Impacts	Proposed Mitigating Measures	Target Performance/ Efficiency	Responsible Entity	Cost Allocation	Guarantee or Financial Agreements
Disposal of Hazardous Wastes. Closure of the Surface Mine, Removal or Rehabilitation of Administration Buildings, Staff Housing, Warehouses and Access Roads.		Dam, Surface Mine and Waste Rock and Overburden Stockpiles. Consistency in the Land Use Plan of the Project with the Subanen and Local Government. Aesthetic Value. Exposure of Decommissioned Buildings and Structures.	Programs will be Implemented During Closure. Preparation of a Final Mine Rehabilitation and Decommissioning Plan. Implement Soil Remediation Measures, if Necessary, After Conduct of Soil Monitoring Programs. Conduct Geohazard Assessment of the Surface Mine and Overburden Waste Stockpiles. Consultation Activities with Respect to Land Use will be Conducted during the Operational Phase Prior to Closure. Soil Conditioning of Exposed Areas Prior to Revegetation. Planting of a Large Variety of Plant Species within the Disturbed Areas Using Indigenous, Endemic Species in Accordance with the Final Land Use Plan of the Area.		Environmental Management Department. Community Relations Department.	Decommissioning Plan. Environmental Management Department.	Allocation of Final Mine Rehabilitation and Decommissioning Plan Fund. Certificate of Final Relinquishment to be Approved by the CLRF and the MGB.
	Water	Potential Water Quality Degradation from Clearing Activities.	Water Discharges and Washings will Pass Through Detoxification Facilities and Sediment/Neutralization Ponds.	100%	FMDC through Maintenance and Environmental	Costs Identified in the Final Mine Rehabilitation and	Addressed in the Final Mine Rehabilitation and Decommissioning Plan Reviewed and Approved by the CLRF.

Project Activities	Environmental components likely to be affected	Potential Impacts	Proposed Mitigating Measures	Target Performance/ Efficiency	Responsible Entity	Cost Allocation	Guarantee or Financial Agreements
		Localized Erosion from the Mine Structures Undergoing Rehabilitation.	Reduce Slopes and Maintain as Much Vegetation Cover as Possible for Erosion Control. Establish Water Quality Monitoring Program During Mine Closure Activities.		Management Departments.	Decommissioning Plan. Environmental Management Department.	Allocation of Final Mine Rehabilitation and Decommissioning Plan Fund. Certificate of Final Relinquishment to be Approved by the CLRF and the MGB.
Decommissioning Activities. Rehabilitated Lands Programs and Turnover to the Community. Establishment of Sustainability Programs. Community Governance and Financial Management.	Social	Community Issues on Turnover of Rehabilitated Areas, Life-After Mining Opportunities and Sustainability Programs.	Management of Community Issues during the Operations Phase of the Project Using Continuous Stakeholder Dialogue. Long Term Livelihood Programs Introduced During the Operations Phase and Combined with SDMP Projects. Exploration of Private Sector Participation in Post Mining Sustainability and Business Model Preparation. Assistance in Governance Training and Development and Financial Management. Continued Presence of FMDC After the Closure of Mining Operations and Transition of Rehabilitated Lands, SDMP and Sustainability Programs to the Community.	100%	FMDC through the Community Relations and Environmental Management Department.	Final Mine Rehabilitation and Decommissioning Fund. Social Development Management Fund. Private Sector Business Enterprises.	Addressed in the Final Mine Rehabilitation and Decommissioning Plan Reviewed and Approved by the CLRF. Allocation of Final Mine Rehabilitation and Decommissioning Plan Fund. Certificate of Final Relinquishment to be Approved by the CLRF and the MGB.

E.S. 3.4 Risiko at walang tiyak na implikasyon ng mga desisyon

Table E.S.- 11 Buod ng mg Risiko sa lugar

Environmental Aspects	Risks and uncertainties relating to the findings and implications for decision-making
Geohazards	Risks are associated with uncertainties in geotechnical properties of soils and rocks, which can be minimized with the continuation of preventive measures and site monitoring. The mine site area is highly susceptible to earthquake and water-induced landslides. FMDC will ensure that proper drills are undertaken. Risks cannot be eliminated but can be managed using proper mining designs and technologies that allow safe operations.
Terrestrial Vegetation and Wildlife	It is uncertain that immediate remedial and reforestation will hold the top soil intact nor suffice the presence of trees considering the high potential for landslides. Mineralization of the soil is a key factor, as the levels of metals in the soil is not conducive to vegetative growth.
Hydrology	The depletion of groundwater as a risk is anticipated to be significant but considered low to medium as no established spring water from the mountain is being utilized by the community PHIVOLCS has indicated that the area is very high potential for both earthquake and water induced landslides. Mitigation may temper the effects of mining but must keep the local communities well prepared for disasters. Risks cannot be eliminated but can be brought down to a manageable level.
Water Quality	Risks associated with the release of deleterious substances which were not previously identified in the mine planning and design. The risks will be eliminated by continued and active monitoring including pilot testing, if needed. The possible sources of leaks from machine operations are considered, and the mitigation measures are provided to prevent any occurrence or scenario including disaster risk planning.
Climate, Air Quality and Noise	Mine Safety will be strictly enforced, and no shortcuts tolerated. Fugitive dust will always be a key feature of mine operations and materials/hauling trucks movement, with health effects down the line, including workers safety and community health; they should be strictly monitored.
Socioeconomics, Public Health and Safety	Risks are associated with negative perception and conflicts with stakeholders (grievance) which normally occur in all communities closer to mining operations, however, commitments or measures are included in the EIS and SDMP to address them and should be fulfilled. Other social risks are associated with local security. It could entail provision for additional resources and manpower to handle community- related concerns in terms of security, enhanced coordination with stakeholders and local governments or entail additional resources to manage other concerns not previously identified in the EIA.

E.S. 3.5 EMF and EGF Commitments

Ayon sa DENR Administrative Order No. 2005-07, kailangan magtalaga ng isang environmental guarantee fund sa panahon ng mining operations. Kailangan din ang mekanismo na tinatawag na Contingent Liability and Rehabilitation Fund (CLRF). Ang FMDC ay nangangako ng pagtupad sa lahat ng gawain ayon sa regulations ng CLRF.

Ang DAO 2015-02, or Harmonization of the Implementation of the "Philippine Environmental Impact Statement System and the Philippine Mining Act of 195 in Relation to Mining Projects", ay naglalayon ng mag allocate ng Social Development and Management Program (SDMP) and Environmental Trust Funds (ETF).

Ang FMDC ay magbibigay ng plano at programa ng CLRF, ETFs, at SDMP at ito ay meryong pondo upang gamitin sa pagpapatupad ng EGF at EMF ng mining operations/obligations.

AFFIDAVIT OF UNDERTAKING

I, **MARIANO C. CANDELARIA JR.**, Filipino citizen, of legal age, married, and a resident of **Barangay Turno, Dipolog City, Zamboanga del Norte**, Philippines, after being duly sworn to in accordance with law, hereby depose and state"

1. I am the President of **FLORJENMAR MINING AND DEVELOPMENT CORPORATION**, a corporation duly established and existing under and by virtue of the laws of the Republic of the Philippines with business address at Poblacion, Municipality of Gutalac, Zamboanga del Norte (the "Company");
2. The Company has an existing and valid Exploration Permit No. 010-2022-IX ("EP") with the Government of the Republic of the Philippines consisting of 5,426.47 hectares, located at Gutalac, Zamboanga del Norte ("Contract Area");
3. I have been duly authorized by the Company to sign and execute this Affidavit of Undertaking and to perform any and other obligations in relation thereto, for and on behalf of the Company. A copy of the Secretary's Certificate issued by the Corporate Secretary of the Company is attached herewith as Annex "A";
4. After due consideration of certain terms, the company undertakes to commit to perform all avoidance, mitigation, rehabilitation and compensatory activities for the environmental impact caused by the Gutalac Nickel Project in Barangay Bacong, Mamawan and Bayanihan in Gutalac, Zamboanga del Norte as will be provided in the ENVIRONMENTAL MANAGEMENT PLAN to be prepared as part of the EIS and applicable environmental laws.

IN WITNESS WHEREOF, I have hereunto set my hands this 1 JUN 07 2023 day of _____
2023 at _____.


MARIANO C. CANDELARIA JR.
Affiant

SUBSCRIBED AND SWORN to before me this 1 JUN 07 2023 day of _____, 2023 in the City of _____
affiant exhibiting to me his _____ with number _____ issued on _____
at _____.

Doc. No. 1969
Page No. 88
Book No. 7701
Series of 1023


IVO M. MANDANTES, CPA
NOTARY PUBLIC FOR DIPOLONG CITY
DAPITAN CITY, ZAMBOANGA DEL NORTE
SERIAL NO. 075-2022
ATTORNEY'S ROLL NO. 65014
PTR NO. 2045306 - 1/3/2023 - DIPOLONG
ESTAKA, DIPOLONG CITY
VALID UNTIL 12/31/2024