PROJECT DESCRIPTION FOR PUBLIC SCOPING

1. BASIC PROJECT INFORMATION

Project Name	Proposed Iron Ore Pangasinan Offshore Magnetite Mining Project					
Project Location	Municipalities of Sual, Labrador, Lingayen, Binmaley and and City of Dagupan Province of Pangasinan					
Commodity	Iron Ore / Magnetite Sand					
Project Type	Extraction of Metallic Ore/Mineral (Offshore)					
Project Classification	Category A : Environmentally Critical Project (ECP) Item 2.1.5 Extraction of metallic and non-metallic miner including extraction of oil and gas, deuterium (off-shore)					
Project Area	9,252.4506 hectares					
Annual Extraction	25,000,000 DMT					
Project Components	Major Components: Dredging/Siphon Vessel Magnetic Separator Barges Panamax Vessel Magnetic Separators Gravity Separator/Spirals Hopper/Chute Support Vessels (Tug Boats) Generator sets					
ECC Application	New					
Project Proponent	Iron Ore, Gold, and Vanadium Resources (Phils.) Inc.					
Proponent Address	#20A Sandoval Avenue, Palatiw, Pasig City					
Authorized Signatory/Representative	MARILOU G. LAURIO President					
Contact Details	(No. 20A Sandoval Avenue, Palatiw, Pasig City) +632 8775 7903					

2. PROJECT DESCRIPTION

Iron Ore, Gold, Vanadium Resources (Phils.) Inc. (referred to as *Vanadium Resources*), is a 100% Filipino-owned corporate registered with the Securities and Exchange Commission on September 15, 2015 with a current authorized capital Php500,000,000.00 and paid-up capital of Php 31,250,000.00, which conforms to the pertinent provisions of DENR Memorandum Order (DMO) No. 2013-01, pertaining to the minimum authorized capital and paid-up capital requirements. Vanadium Resources' corporate primary purpose per its Articles of Incorporation is *"To engage in the business of operating mines and of prospecting, exploration and mining concentrating, converting, smelting, treating, refining, preparing for market, manufacturing, buying, selling, import, export on wholesale basis, exchanging and otherwise producing buying and dealing in all kinds of ores, metals, gold and minerals, hydrocarbons, acids and chemicals and in the products and by-products of every kind and description and by whatever process".*

The Project is covered by a Financial or Technical Assistance Agreement (FTAA) No. 07-2020-I-OMR approved by the Office of the President on November 25, 2020. The government has entered into an agreement with Iron Ore, Gold, Vanadium Resources (Phils.) Inc., for the large-scale exploration, development and commercial utilization of minerals found within the "Contract Area", where Vanadium Resources has obtained the exclusive rights to conduct mining operations for the extraction of magnetite sand.

As such, Vanadium Resources has initiated the conduct of an Environmental Impact Assessment Study, in compliance with the guidelines of the Philippine Environmental Impact Statement System or the PEISS, in applying for the proposed project's Environmental Compliance Certificate (ECC).

2.1 Project Location

2.1.1 Location and Area

The Project Contract (FTAA) area is estimated at 10,064.2922 hectares over the municipal waters of the Municipalities of Sual, Labrador, Lingayen, Binmaley, Dagupan City and San Fabian, all in the Province of Pangasinan, shown in **Figure 1.1**. The boundaries of the Project Area are delineated by thirty (30) points whose geographic coordinates are presented in **Table 1**. The extraction and study area however will exclude the portion within the municipal waters San Fabian, shown in **Figure 1.2** and covers an estimated 9,252.4506 hectares.



Figure 1.1 : Location Map of the FTAA Project Area (Google Earth)



Figure 1.2 : Location Map of the Project Area (Google Earth)

Latitude	Longitude
16°04'30''N	120°09'30"E
16°05'30''N	120°09'30"E
16°05'30''N	120°08'00"E
16°10'00''N	120°08'00''E
16°10'00''N	120°09'30''E
16°05'30''N	120°09'30''E
16°05'30''N	120°15'00"E
16°07'00''N	120°15'00"E
16°07'00''N	120°16'00''E
16°07'30''N	120°16'00''E
16°07'30''N	120°17'00"E
16°08'30''N	120°17'00"E
16°08'30''N	120°18'00''E
16°09'30''N	120°18'00''E
16°09'30''N	120°23'30"E
16°08'30''N	120°23'30"E
16°08'30''N	120°22'30"E
16°08'00''N	120°22'30"E
16°08'00''N	120°21'00"E
16°07'30''N	120°21'00"E
16°07'30''N	120°20'30"E
16°07'00''N	120°20'30"E
16°07'00''N	120°19'00''E
16°06'00''N	120°19'00''E
16°06'00''N	120°17'30''E
16°05'30''N	120°17'30''E
16°05'30''N	120°16'30''E
16°05'00''N	120°16'30''E
16°05'00''N	120°14'30''E
16°04'30''N	120°14'30"E
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Table 1 : Geographic Coordinates of the FTAA Project Area

The breakdown of areas covered by the FTAA is summarized below. This project however excludes the portion within the municipal waters of San Fabian:

- Sual-Labrador : 2,222.6476 has.
- Dagupan : 4,344.6988 has.
- Lingayen : 1,552.0437 has.
- Binmaley : 1,110.9506 has.
- San Fabian : 811.8416 has.

The project area is 2-4 kilometers fronting the coastline of the aforementioned municipalities and city. Host barangays are summarized in the **Table 2**.

Table 2. List of flost barangays per municipality and only						
Municipality / City	Direct Impact (Host) Barangays					
Sual	1. Baguioen					
	2. Baybay Sur					
	3. Baybay Norte					
	4. Pangascasan					
	5. Poblacion					
Labrador	1. Tobuan					
	2. Uyong					
	3. Laois					

Table 2 : List of Host Barangays per Municipality and City

Municipality / City	Direct Impact (Host) Barangays
Lingayen	1. Sabangan
	2. Estanza
	3. Malimpuec
	4. Capandanan
	Pangapisan North
	Pangapisan Sur
	7. Poblacion
	8. Libsong West
	9. Libsong East
	10. Maniboc
Binmaley	1. Baybay Lopez
	2. San Isidro Norte
	3. Buenlag
	4. Sabangan
Dagupan City	1. Bonuan Boquig
	2. Bonuan Binloc
	Bonuan Gueset
	4. Pugaro Suit

2.1.2 Project Accessibility

The project area can be accessed by large vessels from the sea through the Lingayen Gulf. In the event that smaller sea vessels are needed to bring in supplies and personnel from mainland Pangasinan, the project area can be accessed from local ports and jetties from the coastal towns of Sual, Labrador, Lingayen, Binmaley and San Fabian and the City of Dagupan.



Figure 2 : Project Map Showing Coastal Barangays

2.2 Project Rationale

The proposed project is basically utilization of untapped magnetite deposits in the offshore areas of Lingayen Gulf which will undoubtedly contribute to the local and national economic development through its contibution in the iron/magnetite sand production and supply. The project will generate employment, produce marketable mineral products that will generate revenues and associated taxes. In addition, the social and environmental commitments of the proponent will provide benefits to the host and local communities.

2.3 Project Alternatives

The most obvious alternative is not to utilize the magnetite sand deposits. There will be no environmental impacts since there will be no activity in the area, but the prospective benefits from using mineral resources and the favorable international market for iron will be not be taken advantage. There will be no contribution of the GDP.

2.3.1 Facility Siting

The facilities (on board a marine vessel) to be used in extracting magnetite sand from the seabed have to be located inside the tenement area as this is dictated by the location of the mineable deposits. Processing of the extracted materials will also be done on board. The alternative onshore processing of extracted magnetite sand will entail multiple handling of the materials which is more costly and may affect the economic viability of the proposed project. In addition, this will entail additional area and thus environmental footprint of the project.

2.3.2 Process and Technology

The project will use an old established and stable technology in the recovery of magnetite sand which are screening and magnetic separation. The process is purely physical using the magnetic property of the magnetite mineral, i.e. will not use any reagents or chemicals. The alternatives for Magnetic Separation process is the use of Gravity Separators (such as Spiral Concentrators) and Jigs using heavy media fluids which is based on the high density property of magnetite sand. These alternative processes however are inferior to magnetic separation in term of metal recovery and purity of magnetite concentrate products.

2.3.3 Resource Utilization

Lingayen gulf is a geologic structure that serves as the repository of sediments and minerals coming from the rivers that transport eroded materials from the highlands of the Cordillera Mountain ranges. As such, it is a geologically favorable environment for hosting sedimentary deposits that can be extracted profitable based on prevailing economic and market conditions for such minerals. There is a high likelihood that such economic deposits now exist in the area due to the increasing trend of the global demand for iron and steel. Utilization of such mineral deposits will create wealth and benefits in the form of mineral products produced and sold, and the employment generated in the production process. Such project will also boost the local economic activities at the project site as the project will create demand for local products and services.

2.3.4 No Project Option

In the event that the project is not developed or pursued, the major implication will be missing out the potential regional and national contribution to the economy. Considering the potential mine life of 25 to 50 years coterminus with the FTAA which is expected to yield a considerable benefits, the contribution to the country's recovery from the current health crisis and long term development is undoubtedly substantial.

2.4 Project Components

There will be no inland facilities for this project. Extraction, separation and transport will be undertaken in the siphoning vessel. Hence the components of the extraction process are all confined in the vessel and described in the table below:

Component / Particulars	Description / Specification / Units
1. Seabed preparation	Suction cutter head
2. Extraction/suction of magnetite bearing	Pumps
sediments	
	Pumps Suction Pipeline
3. Recovery of magnetite sand concentrates	Conveyors
	Trommel screens
	Magnetic separators
	Flatforms
	Onboard Generator sets
4. Washing of Magnetite concentrates	Desalination System
5. Return of Waste/barren materials	Discharge Pipeline
6. Environmental protection	Pollution control devices
7. Support facilities	Engine Room
	Control and Communications Office
	Mess hall and staff accommodation

Table 3 : Project Components and Specifications of the Siphon Vessel

2.5 Process and Technology

Iron Ore Gold and Vanadium Resources (Phils.) Inc., shall consider the extraction of magnetite starting only within mine operational area from a distance of 4 km away from shoreline located at Lingayen Gulf, Pangasinan This is to prevent or minimize the negative impact of disturbed sand on the quality of water that was traditionally used by the people for fishing.

The extraction for magnetite sand will simply utilize a siphon vessel or an Extraction Platform. The extracted sand will then be temporarily stored, dewatered, and separated from the non-magnetic sands on board barges. All the processes for extraction will be strictly mechanical, no chemicals will be used. In addition, all phases of the operation, from the extraction up to the magnetic separation, will be done offshore. The process is smaller in scale compared to the extraction methods to be used inland.



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Figure 3 : Artist impression of the plain suction dredge principle
Source : <u>https://www.hollandmt.com/News/NewsItem/HollandMT%20designs%20Plain%20Suction%20Dredger.aspx</u>
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Only magnetite materials will be extracted. Caution will be practiced by the proponent to keep the edge of the pipe as close as possible to the sea floor to minimize the agitation of the sand, which may cause the deterioration of the quality of the water, which will impact negatively on marine organisms. Such process entails less impact to the environment in general.

The method to be used will depend on a number of factors including the depth to the sea bed, the degree of consolidation of the sands, ocean weather conditions, capital and operating costs, etc. At this early stage the preferred option is the plain siphon.

The negative environmental impact of the magnetite offshore extraction and recovery process is minimal. The extraction process is via siphon vessel or Extraction barge with magnetic separator, and processing equipment on board. The siphoning action of the Siphon Vessel for Magnetite Sand Offshore has been considered due to minimal and manageable impact to the sea bottom particularly:

- There is no explosive use, hence there is no blasting activities;
- There is no permanent structure buried to the sea bottom;
- The siphoning area underneath the sea agitated by the siphon pipe/s while it can cause localize turbidity, would immediately cave in upon pull out of the siphon pipe/s due to continuing action of the sea under current;

2.6 Project Size

The project contract area covers an area of 9,252,4506 hectares. There is no current estimation of the mineral resource in the area as the project has not yet started the exploration activites. But based on other magnetite offshore deposits in the country (in view of the absence of any data as of todate), the speculated potential magnetite resource at an assumed average thickness of 10m could be 1 billion cubic meters or 1.69 billion metric tons at 1.69 specific gravity of the materials. If this will be confirmed by the exploration activities to be implemented, the mine life at extraction rate of 5 million tons per year will be about 33 years.



Figure 4 : Artist impression of the offshore iron sands mining & processing vessel of TTRL (Source, https://www.ttrl.co.nz/projects/ and <u>https://youtu.be/nbOvX8eoOSw</u>)

2.7 Project Phases

2.7.1 **Pre-Operation Phase**

The pre-operation phase will cover the Exploration Period which includes Review of related literature, Bathymetric and Depth Sounding Survey, Seismic Reflection Survey, Subsurface Exploration and Confirmatory Drilling.

Once completed, the Final Exploration Report will be submitted for approval, Environmental Impact Statement filed for the issuance of the ECC and approval of the Declaration of Mining Project Feasibility.

Other permitting requirement will also be secured during this phase.

2.7.2 **Operations Phase**

The operation phase basically involves the extraction, separation and transport or shipment process.

- Extraction Magnetite sand will simply utilize a siphon vessel or an Extraction Platform;
- Separation The extracted sand will then be temporarily stored in the barges, dewatered, and separated from the non-magnetic sands on board barges. All the processes for extraction will be strictly mechanical, no chemicals will be used. In addition, all phases of the operation, from the extraction up to the magnetic separation, will be done offshore.
- Transport & Shipment



2.7.3 Decommissioning / Demobilization Phase

Considering that the extraction and other related activities will be done offshore, this phase would basically involve demobilization of vessels and remediation as deemed necessary.

A decommissioning plan will be prepared by the Proponent which will include demobilization of all vessels from the project area. The project area will be void of all equipment, navigational aids, warning devices and similar materials used during the extraction operation. Prior to actual decommissioning, corresponding clearances will be sought from the LGU (as necessary) and other government agencies having jurisdiction on the operation of all vessel utilized for the project.

Water quality will be monitored to ensure that it is compliant with DENR standard parameters. In the event of exceedance, corresponding remediation measures will immediately be done. Similarly, the ecological environment will be thoroughly evaluated prior to demobilization, ensuring that the marine environment is not compromised by the extraction operation.

Other conditions that will be stipulated in the ECC relative to decommissioning will also be checked for compliance. Demobilization activities will be conducted in coordination with the LGUs, the EMB-DENR, the MGB and other concerned agencies.

2.8 Project Duration

Completion of Exploration Period which includes Review of related literature, Bathymetric and Depth Sounding Survey, Seismic Reflection Survey, Subsurface Exploration and Confirmatory Drilling is targeted to be completed by 3rd Quarter of the year 2021 from the 1st quarter of 2021 from the commencement of the exploration program.

Submission of Final Exploration Report, Environmental Impact Statement and Declaration of Mining Project Feasibility by 4th Quarter of and approval of Commercial Extraction permit by 1^{st h} Quarter of the year 2022

Commercial extraction is expected to commence by 2nd quarter of 2022 and the project is preliminarily speculated in the absence of exploration data to have a have a mine life of about 33 years.



Figure 6 : Project Schedule

2.9 Project Cost

The project's Exploration cost is estimated at PhP 25,000,000.00 which includes funds for environmental management.

2.10 Preliminary Identified Environmental Impacts and Proposed Mitigating Measures

Project Phase/ Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Options for Prevention or Mitigation or Enhancement	Responsible Entity	Cost	Guarantee/ Financial Arrangements	Schedule of Implementation
Operation Phase							
Extraction of Magnetite	Water Quality	Turbidity of water as a result separated sand being dumped back to the sea	Use of long pipe to dump the aggregates back near the sea floor. Use of silt curtains whenever applicable.	Iron Ore	Included in the operating cost	Incorporated in the work and financial program of the project	Start of mining operations
Operation of vessels and extraction equipment	Water Quality	Pollution due to improper disposal or management of domestic waste	Proper segregation and disposal to the accredited collector and disposal facility	Iron Ore	Included in the operating cost	Incorporated in the work and financial program of the project	Start of mining operations
Operation of vessels and extraction equipment	Water Quality Hazardous waste	Pollution due to improper management, handling and disposal of waste oil from vessels and equipment	Implementation of proper storage and documentation of the used oil and soiled rags as stated in RA 6969. Disposal will be handled while using PPE and/or engagement of DENR accredited waste handlers/ transporters.	Iron Ore	Included in the operating cost	Incorporated in the work and financial program of the project	Start of mining operations

Project Phase/ Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Options for Prevention or Mitigation or Enhancement	Responsible Entity	Cost	Guarantee/ Financial Arrangements	Schedule of Implementation
Operation of vessels and extraction equipment	Marine Environment (Marine Ecology)	Deterioration of marine habitat	Management of Extraction vessel to allow a form of progressive mining, allowing impacted organisms to recolonize the previously mined out areas.	Iron Ore	Included in the operating cost	Incorporated in the work and financial program of the project	Start of mining operations
Operation of vessels and extraction equipment	Air Quality	Air pollution due to CO ₂ , SO ₂ and NO ₂ emissions.	Implementation of appropriate and regular maintenance of all vessels and equipment at designated drydock or similar facilities.	Iron Ore	Part of the equipment maintenance cost	Incorporated in the work and financial program of the project	Start of mining operations
Operation of vessels and extraction equipment	Noise	Increased Noise level	Use of low noise diesel generator set and muffler for the vacuum pump	Iron Ore	Part of the equipment maintenance cost	Incorporated in the work and financial program of the project	Start of mining operations
Operation of vessels and extraction equipment	People	Disturbance of fishing grounds affecting livelihood of fisherfolks	 Management of mining activities confining operations to a defined / designated and manageable area (mining block) to allow fisherfolk to continue fishing. Implement Social Developmental Projects in 	Iron Ore	Part of the operating cost	Incorporated in the SDP	Start of mining operations

Project Phase/ Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Options for Prevention or Mitigation or Enhancement	Responsible Entity	Cost	Guarantee/ Financial Arrangements	Schedule of Implementation
			coordination with the LGU, barangays and sectoral groups, aimed to provide alternative livelihood and protection and enhancement of the marine environment.				
Operation of vessels and extraction equipment	People	(Naval) Traffic Congestion	Coordinate with PCG and/or PPA on the traffic routes or schemes that are likely to be used by large vessels	Iron Ore	Part of the operating cost	Incorporated in the work and financial program of the project	Start of mining operations
Abandonment Pha	se						
Demobilization of vessels and equipment	Water	Pollution from oil, grease, etc.	Implementation of proper storage and documentation of the used oil and soiled rags as stated in RA 6969. Disposal will be handled while using PPE and/or engagement of DENR accredited waste handlers/ transporters.	Iron Ore	Part of the operating cost	Incorporated in the work and financial program of the project	During abandonment
Demobilization of vessels and equipment	People	(Naval) Traffic Congestion	Coordinate with PCG and/or PPA on the traffic routes or schemes that are likely to be used by large vessels	Iron Ore	Part of the operating cost	Incorporated in the work and financial program of the project	During abandonment

2.11 Project Photos



Photo 1 Location 1 Center Point Lat: 16-03-47.2228, Long: 120 06 19.31, Facing North North East. Sual Municipal Wharf with a glimpse of Cagbilatan Island on Farther North Horizon on the left side



Photo 2 Location 1 Facing North North West, Sual Municipal Town Port



Photo 3 Location 2, Lat: 16-05-0.0811, Long: 120-06-29.61, Sual Fish Pens surrounding the Island, with Sual Thermal Power Plant on the Left, Cagbilatan Island on the Center, Lingayen Gulf on the Right (FTAA Boundary),



Photo 4 Location 2, Facing Directly East showing Lingayen Gulf



Photo 5 Location Looking Directly East 180 degrees view



Photo 6 Center Point Lat: 16-04-15.7457, Long: 120-10-48.9331 Looking South, Lingayen Gulf Foreshore



Photo 7 SAN FABIAN Looking West, Bolasi Beach, on the farthest Horizon the FTAA Boundary



Photo 8 Lingayen Beach, looking Directly North.

PROPOSED IRON ORE PANGASINAN OFFSHORE MAGNETITE MINING PROJECT



Photo 9 Agno River meeting Lingayen Gulf, Sand Bar Formation



Photo 10 Location 3 Looking South West Dagupan Tondalingan Blue Beach



Photo 11 Location 3 Looking North East- Extension of Tondalingan Beach Farther on the horizon is the San Fabian Beach



Photo 12 From Location 3 Looking Directly North West is the Lingayen Gulf (FTAA Boundary)