DENR

NEWS ALERTS

NEWS CLIPPINGS

STRATEGIC COMMUNICATION AND INITIATIVES SERVICE

1
PAGE

UPPER

LOWER

PAGE 1
STORY

BANNER
STORY

EDITORIAL

CARTOON

D5-17-23

PAGE   DATE

1/2

DENR: MASUNGI STRADDLES OTHER PROTECTED LANDS

STORY BY JEANNETTE I. ANDRADE, JACOB LAZARO AND JANE BAUTISTA

Agency's director in Calabarzon region blames lack of participation of technical staff from the field and central offices in formulating 2017 agreement, says even they were not aware as to when and where it was signed. A2

**By Jeannette I. Andrade,
Jacob Lazaro
and Jane Bautista**
@Team_Inquirer

The fate of the 2017 deal between the government and the foundation overseeing the internationally acclaimed Masungi conservation project in Rizal province now hangs after an official of the Department of Environment and Natural Resources (DENR) on Tuesday said that the land area it covered overlapped with three other areas protected under previous laws.

The Masungi Georeserve Foundation Inc. (MGFI) and the late Gina Lopez, then environment secretary, had entered into a memorandum of agreement (MOA) on the protection and conservation of a 2,700-hectare property that has since been plagued by incidents of violence, alleged land grabbing, and illegal logging and quarrying.

Nilo Tamoria, DENR regional executive director of Calabarzon (Cavite, Laguna, Batangas, Rizal, Quezon), said during Tuesday's hearing of the House committee on natural resources that the area covered by the 2017 MOA straddled three existing protected areas under two earlier presidential proclamations and a law.
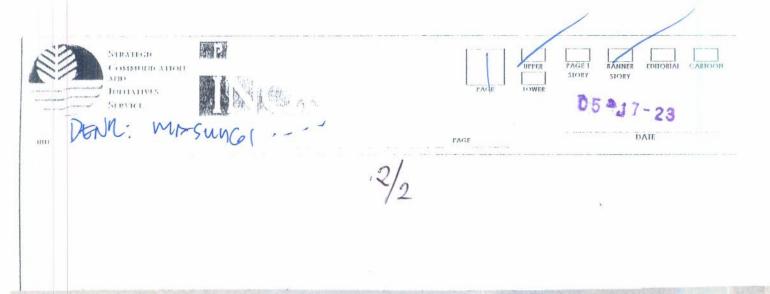
According to Tamoria, these are the Marikina watershed, the Kaliwa River forest reserve, and an unnamed larger area declared protected by Presidential Proclamation No. 1636 issued in the 1970s.
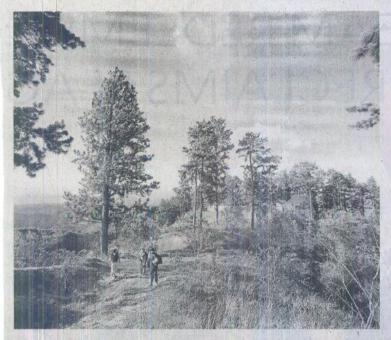
He said the area covered under the 2017 pact likewise overlapped with an ancestral domain title for 21,183 ha issued by the National Commission on Indigenous Peoples (NCIP), noting that 67 percent of Masungi's total land area was covered by a certificate of ancestral domain title issued by the NCIP.

Tamoria maintained that the DENR had "no input as to the technical description of the area covered" by the 2017 agreement, thus, there was "no specific metes and bounds" on the 2,700 ha.

Cavite Rep. Elpidio Barzaga Jr., who chairs the panel, remarked: "Unfortunately no career employee or civil service employee of DENR participated in the execution of the MOA with Secretary Lopez."

"Procedure-wise, any proposal should be validated by the field office. There is no record in the regional and even in the central office as to the complete staff work regarding the formulation and even we are not

ONE WITH NATURE A group of visitors experiences nature through a trek in a section of Masungi Georeserve in Baras, Rizal, in this photo taken in January. —NIÑO JESUS ORBETA

aware [as to] when it was signed and where it was signed," Tamoria pointed out.

"We're just looking at where it was notarized. The complete documentation, especially on the aspect of the technical description, we had no participation," he told the committee.

Constitutional violation

The Department of Justice (DOJ), which is planning to build either a penitentiary or the main office of the Bureau of Corrections on a 270-ha property within the protected area, has also claimed that the 2017 agreement of "perpetual trust" between the government and MGFI violated the Constitution.

Based on Section 2, Article XII of the 1987 Constitution, agreements entered into by the government on codevelopment of the country's natural resources can only last for up to 25 years, Justice Undersecretary Raul Vasquez told Barzaga in a letter dated Feb. 15.

"Any such agreement involving natural resources should thus comply with this constitutional requirement. In light of this, it appears that the perpetual trust conferred to MGFI runs counter to Section 2, Article XII of the 1987 Constitution," Vasquez said.

Vasquez relayed the DOJ's position on the matter at the request of the House committee, which is investigating alleged illegal activities in the Masungi Georeserve.

The DOJ added that some parts of a protected area could be used by the government in partnership with private Filipino organizations and individuals as long as it would be given an environmental compliance certificate by the DENR and pay the corresponding user fees as provided by Republic Act No. 7586, or the National Integrated Protected Areas System Act of 1992.

For conservation

MGFI has countered that its agreement with the DENR should be read as an agreement for a "perpetual land trust for conservation" and not as a perpetual license.

In its position paper submitted on April 11 to the House committee, MGFI said the MOA "should be read in its entirety" and not reduced to a single phrase of "perpetual land trust."

"Otherwise, the 2017 MOA will not only disregard the premium given to the intent of the contracting parties or ignore the most basic rules on interpretation of contracts, but will also diminish the express constitutional provisions in relation to environmental protection and conservation," the foundation said in the document obtained by the Inquirer on Tuesday.

MGFI argued that there was a substantial difference between "exploration, development, utilization" and "conservation," saying that the law defines the latter as "preservation and sustainable utilization of wildlife and/or maintenance, restoration and enhancement of a habitat."

"It is the wise use of natural resources that assures regeneration and replenishment for continuous benefit," it said.

These definitions, according to MGFI, were the opposite of the activities related to "exploration, development and utilization" as development was defined as the work being done to explore and prepare an ore body or mineral deposit for mining. INQ

Reclamation: More harm than good?

ABOUT TOWN
ERNESTO M. HILARIO

RECLAMATION offers coastal countries in various parts of the world the prospect of expanding their land area and hence create more opportunities for economic growth.

In an archipelago like the Philippines whose territory consists of more than 7,100 islands, reclamation is an attractive and convenient option for the government and the private sector to collaborate in making reclaimed land serve economic development goals.

At present, there are a number of proposed and ongoing land reclamation projects.

There were 50 reclamation projects in various stages of construction across the country as of September 2022.

Of these, 20 projects have been approved by the Philippine Reclamation Agency (PRA), while 24 are still in the application stage. The estimated total area of reclamation projects nationwide is 11,800 hectares.

The Bulacan Aerotropolis being built north of Manila by one of the country's biggest business conglomerates is one such reclamation project.

It will reclaim land from the coast of Bulakan municipality to build a new airport, thus decongesting the old, run-down Manila International Airport.

At the same time, the modern airport can contribute immensely to over-all economic growth

It is true that reclamation has huge potential to contribute to sustainable development goals.

There are reclamation projects abroad from which the Philippines can draw valuable lessons.

The reclamation project undertaken in the port of Rotterdam, Netherlands, for instance, is considered a big success as extensive studies have shown that it led to innovative practices and improved social and environmental conditions, apart from complying with strict safety standards and producing economic and social benefits.

Reclamation projects, therefore, can yield additional land that can be tapped for residential, commercial and industrial uses.

Once completed, reclamation projects

can provide additional sources of income for government in the form of taxes from enterprises and factories that choose to locate in reclaimed land.

But reclamation also has its downside. While it sounds like a good developmental idea, it may not be as sound as we might think.

Reclamation projects already approved for implementation by previous administrations appear to have proceeded without due consideration to their adverse economic, environmental and social impacts.

Reclamation projects should be part of an over-all economic development program.

> **What they are urging the government to do now is to review all proposed and ongoing projects to determine whether they will be beneficial or harmful to the economy and the environment**

They should also obtain the required environmental compliance certificates from the DENR.

Moreover, they should undertake proper consultation with the affected communities, such as fisherfolk, since this sector faces the threat of loss of livelihood once the reclamation project gets off the ground.

NGOs opposed to reclamation projects have raised other questions.

Why are reclamation projects already being awarded to proponents when the supposed masterplan that will govern them is still non-existent?

Do these projects even have feasibility studies that will justify the clearing of mangroves and coast-filling already undertaken by reclamation companies?

Kalikasan-People's Network for the Environment (Kalikasan-PNE) and the People's Network for the Integrity of Coastal Habitats and Ecosystems (People's NICHE) are among the non-government organizations opposed to reclamation projects.

They cite the reduction of fishing grounds which can threaten food security.

Once land reclamation starts, they foresee incalculable damage to mangroves, seagrass and corals. And reclamation will also lead to the displacement of people in coastal areas.

Last April 22, 2023, on Earth Day, groups renewed their call for the government to stop reclamation and dredging projects without the required Environmental Impact Study (EIS).

They are one in saying that reclamation, dump-and-fill, dredging and seabed quarrying would lead to habitat destruction and biodiversity loss.

What they are urging the government to do now is to review all proposed and ongoing projects to determine whether they will be beneficial or harmful to the economy and the environment.

A concrete step along this direction is the recent move by the Department of Environment and Natural Resources (DENR) to convene an experts' forum to review the government's policy on reclamation and to craft recommendations on how this can be improved so that it results in sustainable development rather than cause adverse economic, environmental and social costs.

The forum seeks to foster dialogue among experts and stakeholders to generate insights on reclamation, identify entry points as well as gaps in policy, and obtain expert recommendations on what policies should be put in place at both the national and local levels to make reclamation serve development goals.

The expected output of the experts' forum is a set of policy guidelines that will inform the review of existing reclamation laws and policies.

The DENR has pointed out that while the recently launched Philippine Development Plan 2023-2028 prioritizes economic growth and a conducive business environment to increase public-private partnerships (PPPs) in various sectors, it also seeks to protect the environment and strengthen community resilience from climate change hazards.

In the end, what matters is what President Ferdinand R. Marcos Jr., said in his first State of the Nation Address (SONA) in July last year.

He emphasized: "Companies who exploit our natural resources must follow the law... there is no question that the preservation of the environment is the preservation of lives."
(Email: ernhil@yahoo.com)

House panel sets inquiry into Metro water shortage

BY JOVEE MARIE N. DELA CRUZ

🐦 @joveemarie

THE House Committee on Metro Manila Development has called the heads of Metropolitan Waterworks and Sewerage System (MWSS), Maynilad, Manila Water, Philippine Atmospheric, Geophysical and Astronomical Services Administration (Pagasa), Department of Environment and Natural Resources-Water Resources Management Office and Laguna Lake Development Authority to a meeting today (Wednesday) to brief the panel on depleting water supplies in Metro Manila.

Manila Second District Rep. Rolan Valeriano, the panel chairman, said his committee would discuss the depleting water supply for Metro Manila with concerned government agencies.

The committee has also invited the National Economic and Development Authority, National Power Corp., National Water Resources Board, and Local Water Utilities Administration.

The committee is also expected to look into the water level situation in Angat and La Mesa Dams.

Valenzuela Rep. Eric Martinez raised the continuous decline of dams' water levels, citing Pagasa's monitoring effort.

For his part, Makati Rep. Luis Campos recalled having pushed for the desalination of water drawn from the Laguna de Bay as another source of potable water for Metro Manila.

According to Valeriano, Angat provides 97 percent of Metro Manila's water or 4,000 million liters per day of water via the La Mesa reservoir system.

"Although 60 percent of this is allocated to Maynilad, it has been penalized a couple of times lately by MWSS due to repeated water interruptions," he said.

"More allocated to Maynilad, still not enough. Remember, Manila Water has only a 40 percent share," he added.

Valeriano said it is critical to find out "how worse exactly is our water situation at present."

STRATEGIC COMMUNICATION AND INITIATIVES SERVICE

THE PHILIPPINE STAR
TRUTH SHALL PREVAIL

3 PAGE
☑ UPPER
☐ LOWER
☐ PAGE 1 STORY
☐ BANNER STORY
☐ EDITORIAL
☐ CARTOON

D5 = 17-23

TITLE: PAGE   DATE

Maynilad takes steps vs Laguna de Bay deterioration

By RICHMOND MERCURIO

West zone concessionaire Maynilad Water Services Inc. has laid out necessary interventions to help prevent further deterioration in Laguna de Bay's water quality, which may trigger water supply interruption.

Maynilad, which sources at least 300 million liters per day (MLD) from Laguna de Bay, said it has installed ultrasonic algae control equipment and upgraded its silt curtain to protect the lake from pollutants and keep its quality stable.

Laguna de Bay, the country's largest lake and a major source of potable water, has seen a deterioration in its water quality due to industrial pollutants, excessive fish feeds and chemicals.

Maynilad's monitoring of the lake's water quality showed the water's nephelometric turbidity units reached 154 in April and a high of 233 NTU from May 1 to 7.

The company said the lake's ideal NTU should be below 100 or ranging from only 40 to 70.

Latest data from the state-run Laguna Lake Development Authority showed that there is a high concentration of blue-green algae in the lake, a form of bacteria that adversely affects both water quality and the filtration system in the lake.

"Maynilad began dredging the portion of the lake near its facility's intake structure to minimize vulnerability to spikes in turbidity," the company said in a statement.

"It has also been replacing the filters of its treatment plants more frequently than the filter's expected lifespan," it said.

Maynilad currently gets 300 MLD from the lake through its two treatment plants in Barangay Putatan in Muntinlupa City.

The supply serves around 10 percent of the company's total customer base, while the rest or 90 percent of its supply is sourced from Angat Dam in Bulacan.

Maynilad, the largest private water concessionaire in the Philippines, began tapping Laguna de Bay as an alternate source of raw water in 2010.

The company is in the process of constructing its third treatment facility, which will be completed by the end of the year.

Maynilad serves the west zone or the areas of Caloocan, Pasay, Parañaque, Las Piñas, Muntinlupa, Valenzuela, Navotas and Malabon as well as portions of Manila, Quezon City, Makati and Cavite.

Maynilad prepares for water shortage

WEST Zone concessionaire Maynilad Water Services Inc. (Maynilad) said on Tuesday that it had laid out interventions, such as the installation of ultrasonic algae control equipment and upgrade of its silt curtain, as the government and the private sector are keeping an eye on all water resources to ensure that supply will be enough to meet the demand amid a looming El Niño.

Muntinlupa Mayor Ruffy Biazon had said that the deteriorating water quality in Laguna Lake, the country's largest lake and a major source of potable water, was due to industrial pollutants, excessive fish feeds and chemicals threatening to cut Metro Manila's water source.

Biazon said that it was "imperative" to protect the lake from pollutants to keep its quality stable and avert any water interruption.

"For Laguna Lake to become a truly viable source of drinking water, it has to be protected. It is important to develop and implement programs and projects for the lake to ensure that its water quality is maintained at standards intended for its use," he said.

Maynilad said that it had laid out interventions to prevent the situation from worsening and triggering water interruption.

The water concessionaire said that it consistently upgrades its water treatment facility to provide customers with clean water.

But it admitted that the prolonged high turbidity in Laguna Lake makes it harder for treatment plants to process water before supplying it to the customers.

Reports said that Laguna Lake has become shallow to as low as 2 meters due to siltation that strong gusts of wind can easily stir up sediments in the lake bed, making the raw water highly turbid.

Based on Maynilad's monitoring of the lake's water quality, the water's nephelometric turbidity units (NTU) reached 154 levels in April and a high of 233 NTU from May 1 to 7.

Ideally, the lake's NTU should be below 100 or ranging from only 40 to 70. Thus, Maynilad began dredging the portion of the lake near its facility's intake structure to minimize vulnerability to spikes in turbidity.

It has also been replacing the filters of its treatment plants more frequently than the filter's expected lifespan.

Maynilad currently gets 300 MLD from Laguna Lake through its two treatment plants in Barangay Putatan in Muntinlupa City.

The supply serves around 10 percent of the company's total customer base.

The rest or 90 percent of its supply is sourced from Angat Dam in Bulacan.

Maynilad began tapping Laguna Lake as an alternate source of raw water in 2010.

It is currently in the process of constructing its third treatment facility, which will be completed by the end of the year.

The latest data from the state-run Laguna Lake Development Authority (LLDA) showed that there is a high concentration of blue-green algae in the lake, a form of bacteria that adversely affects both water quality and the filtration system in the lake.

Although algae are fish food, the LLDA warned that the buildup can also cause fish kills.

To date, around 80 percent of bangus and tilapia supply in Metro Manila comes from Laguna Lake.

The LLDA deployed more than a hundred solar-powered paddle wheels to prevent the growth of the algae.

FRANCIS EARL CUETO

STRATEGIC COMMUNICATION AND INITIATIVES SERVICE

BusinessMirror
A broader look at today's business

PAGE

UPPER
LOWER

PAGE 1 STORY   BANNER STORY   EDITORIAL   CARTOON

05 - 17 - 23
DATE

TITLE :   PAGE

PBBM water crisis agenda eyes Laguna de Bay

LITO GAGNI

PRESIDENT Marcos's agenda on resolving the water crisis will include Laguna de Bay, the biggest freshwater lake in the Philippines, which is now threatened by the continued discharge of industrial pollutants resulting in the deterioration of its water quality.

The Laguna de Bay solution forms part of what the President said is an "overall plan" to address the looming water crisis since water from the lake is also used as a source of drinking water for Metro Manila residents. Thus, there is a need to ensure that the quality of water in the lake is not affected by chemicals, which makes it difficult for the water to be processed as drinking water.

"All of these things we have already put up together—we have already [put] together [an] overall plan. Now, we have to implement it. There are many agencies that are concerned when it comes to water management. So we have to make it more cohesive," PBBM said when asked how his administration will address the water crisis.

This means that the Laguna Lake Development Authority (LLDA), which oversees the implementation of measures to ensure that indus-trial pollutants are not discharged into the lake, will have to act fast especially with the looming El Niño threat that PAGASA had flagged this coming month. After all, Maynilad Water Services, which services the West Zone, sources 300 million liters of water per day from the lake.

Aware of the looming water crisis, the President had set up the Office of Water Management, which will be under the Office of the President, to monitor the situation. That means LLDA will have to continuously monitor the discharge of industrial pollutants into the lake so that the processing of drinking water will not be affected.

The latest LLDA data showed that there is a high concentration of blue-green algae in the lake, a form of bacteria that adversely affects both water quality and the filtration system in the lake. Thus, the LLDA deployed more than a hundred solar-powered

Government agencies need to help in the President's economic agenda to make the Philippines a middle-income nation, and that means pursuing in their own turf the delivery of government services such as that of clean water, part of the United Nations' Sustainable Development Goal. Freeing President Marcos from these mundane and tedious tasks will give him more time to concentrate on making the economy grow.

paddle wheels to prevent the growth of the algae.

The challenge for LLDA to conform with President Marcos' agenda on addressing the water crisis is to address the worsening turbidity in the Laguna lake water as this prolongs the processing of drinking water and may even result in the cut-off in supply. Aggravating the situation is the fact that parts of the Laguna lake has become shallow to as low as two meters due to siltation that strong gusts of wind can easily stir up sediments in the lake bed—making the raw water highly turbid.

We understand that Maynilad's monitoring of the lake's water quality showed that the water's Nephelometric Turbidity Units reached 154 levels in April and a high of 233 NTU from May 1 to 7. Ideally, the

STRATEGIC
COMMUNICATION
AND
INITIATIVES
SERVICE

TITLE: PBBM water...

PAGE A17

UPPER / LOWER

PAGE 1 STORY   BANNER STORY   EDITORIAL   CARTOON

PAGE 2/2

05-17-23

DATE

lake's NTU should be below 100 or ranging from only 40 to 70.

This is a big challenge for LLDA and the Office of Water Management even as they look elsewhere for other sources of water for the metropolis, such as the installation of rainwater cisterns, to avert a crisis. But what LLDA can do is to fully monitor the pollutants that are dumped into the lake as these contribute to the water's turbidity.

Government agencies need to help in the President's economic agenda to make the Philippines a middle-income nation, and that means pursuing in their own turf the delivery of government services such as that of clean water, part of the United Nations' Sustainable Development Goal. Freeing President Marcos from these mundane and tedious tasks will give him more time to concentrate on making the economy grow.

President Marcos has been at the forefront of moves to put vigor in the economy, traveling to foreign shores to pitch the country's investment potential and address inefficiencies in the government as he embarks on an ambitious plan to make jobs available here. So far, he has been successful in roping in foreign direct investments to benefit the economy.

But then, he also needs the help of government bureaucrats, and he needs not address his sights on small items like the Laguna Lake turbidity that can be addressed fully on the ground.

Editorial

Ride-hailing firms should take lead in emissions reductions

ACCORDING to the companies' respective environmental, social and governance (ESG) reports made public last week, the two biggest ride-hailing and delivery firms in Southeast Asia — Singapore-based Grab, which is the leading operator here in the Philippines, and Indonesia's GoTo, the parent company of ride-hailing firm Gojek and e-commerce company Tokopedia — are failing miserably in their efforts to work toward achieving their carbon-neutrality pledges, recording a surge in greenhouse gas (GHG) emissions in 2022. This is obviously a problem that cannot be ignored, but given the unique position these companies hold in the economies where they operate, the problem should be considered an opportunity rather than a reason to condemn them.

Grab and GoTo both pledged to achieve carbon-neutral or zero-emissions status in 2021; Grab set a target date of 2040, while the smaller GoTo, which does not operate in as many countries, set a goal of 2030. However, those pledges were almost immediately derailed by a sharp increase in reported GHG emissions by both companies. Grab's carbon emissions skyrocketed by 123 percent to 3.35 million metric tons of carbon dioxide equivalent (CO2e) between 2021 and 2022, while GoTo recorded a 19-percent increase in the same period to just under 1 million tons of CO2e.

In both cases, the total emissions were almost entirely attributed to what are called Scope 3 emissions, or emissions that are from assets not directly owned or controlled by a company but are indirectly determined by the company's value chain.

In the case of Grab and GoTo, that means the large fleets of vehicles used for transportation and deliveries; across Southeast Asia, these number more than 5 million for Grab, of which there were 65,000 in the Philippines before the pandemic — a figure determined by an arbitrary cap on the number of drivers imposed by the Land Transportation Franchising and Regulatory Board (LTFRB). What makes Grab's surge in emissions all the more remarkable is that its roster of drivers significantly diminished during the pandemic, by almost half here in the Philippines.

In response to media questions about its surging emissions, Grab has highlighted several initiatives to reduce its environmental impact. Its latest ESG report claims that 39,000 metric tons of GHG emissions were eliminated by encouraging the use of zero-emission and low-emission vehicles, such as bicycles for deliveries and electric vehicles (EVs) or hybrid vehicles for transport services. The company has also emphasized that its decarbonization strategy takes into account its business expansion goals, although it does seem the sharp increase in GHG emissions last year may have come as a surprise.

In a thinly veiled, and we think justified, criticism of the governments in the countries where Grab operates, a Grab spokesman told a media interviewer that the success of its carbon neutrality strategy will largely depend on how quickly it can encourage its drivers to switch to EVs, which is, in turn, dependent on the market readiness for electrification. So far, only the Singaporean and Indonesian governments have announced strategies to shift their countries' vehicle populations to EVs, by 2040 and 2050, respectively.

We believe our government should work with Grab to develop the policy goals of broadening the adoption of EVs and reducing vehicles that have already been stated, and supported by recent legislation. For the government, the Grab ecosystem of vehicles and drivers is a useful sandbox to test initiatives such as tax incentives and subsidies to promote EV adoption as well as assessing ways in which ESG reporting can be improved to provide even more accurate data. Grab has enough vehicles and drivers to provide sound results of tested initiatives, which can then be fine-tuned and expanded to the entire country.

Grab Philippines would obviously have to speak for itself, but we believe the company would welcome such a partnership with the government, and the chance to not only improve its only environmental footprint but contribute to greater sustainability on a national scale. As for the government, it should not neglect the chance to make use of private sector resources and expertise to achieve the country's sustainability goals.

Oil spill continues to affect Pola

THE municipality of Pola in Oriental Mindoro continues to experience the effects of the oil spill from the sunken tanker MT Princess Empress.

Mayor Jennifer Cruz of Pola said the estimated damage caused by the oil spill to the livelihood of fisherfolk reached P300 million while the estimated damage to the shoreline and mangroves reached P134 million.

Cruz said that oil slick persists as the oil coming from the tanker has not been contained yet."When the wave comes there are still traces of oil, because as they've said the (sunken) tanker still has a lot of oil in it," the mayor said.

Cruz also said that there is no specific time frame from the national government on how long the cleanup drive will last.

"But other experts said that it will take six months to one year," Cruz said.

The mayor also said that it will take time for them to recover as the corals have been badly affected and the oil has been immersed beneath the sand.

Cruz added that the most effective way to hasten the cleanup is to first contain the leak from the sunken tanker.Meanwhile, she noted that the cash-for-work program of the Department of Social Welfare and Development is still ongoing and was able to aid about 1,600 individuals.

The Department of Environment and Natural Resources earlier reported that P517 million worth of recovery assistance was distributed to 96,256 beneficiaries in Regions 4A (Cavite, Laguna, Batangas, Rizal, Quezon), 4B (Mindoro Oriental and Occidental, Marinduque, Romblon and Palawan) and Region 6 or Western Visayas.

The MT Princess Empress was carrying around 800,000 liters of industrial oil when it sank off the central island of Mindoro on February 28. As of May 11, the National Task Force on Oil Spill Management said the oil spill has affected 40,733 families in the three regions.

JANINE ALEXIS

4 hurt, 30 families flee Koronadal City floods, landslides

KORONADAL CITY (PNA) — Heavy downpours triggered flash floods that submerged several communities and forced civilians to flee to safer grounds here on Monday night, May 15.

At least four persons were slightly injured and more than 150 individuals or 30 families were rushed to the regional evacuation center as flash floods hit Barangay San Jose.

Thirteen of the families are still at the evacuation center while the barangay government is extending food aid to displaced families.

Barangay San Jose Chairman Danilo Simtim said most of the houses hit by the flash floods were in Puroks Pantalan and Maawin inundated by knee-high mud and floating garbage.

Brownout engulfed the barangay after fallen tree branches hit electric posts.

Cyrus Urbano, city disaster risk reduction and management council officer, said two houses were destroyed by rampaging water that hit the barangay after several hours of heavy rain.

Several low-lying residential areas were also submerged by knee-deep floods primarily due to clogged drainage canals.

05-17-23

27 areas in PH log 'dangerous' heat index

By ELLALYN RUIZ

Scorching heat continued to plague parts of the country on Tuesday, May 16, with heat index values reaching "dangerous" levels in 27 monitoring stations of the Philippine Atmospheric, Geophysical, and Astronomical Services Administration (PAGASA).

The heat index is the measurement of how hot it feels when relative humidity is factored in with the actual air temperature.

Based on PAGASA's data, stations with dangerous heat index levels recorded on Tuesday were Daet, Camarines Norte (47°C); Masbate City, Masbate (46°C); Borongan, Eastern Samar (45°C); Catarman, Northern Samar (45°C); Infanta, Quezon (45°C); Maasin, Southern Leyte (45°C); Roxas City, Capiz (45°C); Baler, Aurora (44°C); Calapan, Oriental Mindoro (44°C); Dipolog City, Zamboanga del Norte (44°C); Juban, Sorsogon (44°C); Tuguegarao City, Cagayan (44°C); Virac, Catanduanes (44°C); Ambulong, Tanauan, Batangas (43°C);

Aparri, Cagayan (43°C); Catbalogan, Western Samar (43°C); Central Bicol State University of Agriculture, Pili, Camarines Sur (43°C); Iloilo City, Iloilo (43°C); Laguindingan Airport, Misamis Oriental (43°C); Surigao City, Surigao del Norte (43°C); Tacloban City, Leyte (43°C); Coron, Palawan (42°C); Dagupan City, Pangasinan (42°C); Dauis, Bohol (42°C); Laoag City, Ilocos Norte (42°C); Tayabas City, Quezon (42°C); and Zamboanga City, Zamboanga del Sur (42°C).

According to PAGASA, a heat index ranging from 42°C to 51°C indicates impending "danger," as "heat cramps and heat exhaustion are likely," and "heat stroke is probable with continued activity."

PAGASA recorded the highest heat index in the country so far this year on May 12 in Legazpi City, Albay at 50°C.

STRATEGIC COMMUNICATION AND INITIATIVES SERVICE

PHILIPPINE DAILY
BALANCED NEWS • FEARLESS VIEWS
INQUIRER

PAGE | UPPER / LOWER | PAGE 1 STORY | BANNER STORY | EDITORIAL | CARTOON

TITLE: _____ PAGE ____ DATE 05-17-23

Republic of the Philippines
Department of Environment and Natural Resources
Visayas Avenue, Diliman, Quezon City
Tel. Nos. (02) 8920-0691/8925-2375/8917-865-3367/8917-866-3367
Website: http://www.denr.gov.ph / E-mail: web@denr.gov.ph

MAY 04, 2023

DENR Administrative Order
No. 2023 - 05

SUBJECT : REVISED GUIDELINES FOR THE CLASSIFICATION AND REPORTING STANDARDS OF EXPLORATION RESULTS, MINERAL RESOURCES AND MINERAL RESERVES

Pursuant to the pertinent provisions of Republic Act (RA) No. 7942, otherwise known as the Philippine Mining Act of 1995, and its implementing rules and regulations, and in line with the continuing thrust of the Government to revitalize the Philippine minerals industry and promote responsible mining, the following guidelines for the classification and reporting standards of exploration results, mineral resources, and mineral reserves in accordance with the Philippine Mineral Reporting Code of 2020 (PMRC 2020), amending certain provisions of the DENR Administrative Order No. 2010-09, are hereby promulgated for the guidance and compliance of all concerned.

CHAPTER I
INTRODUCTORY PROVISIONS

SECTION 1. Rationale. To further ensure the effective implementation of R.A. No. 7942, its revised implementing rules and regulations under Department Administrative Order No. 2010-21, and Executive Order No. 270, series of 2004, certain provisions of DENR Administrative Order No. 2010-09 are hereby amended to provide for appropriate and up-to-date classification and reporting standards of exploration results, mineral resources and mineral reserves consistent with the advances and upgrades of internationally accepted standards for local industry adoption.

The imposition of such standards among mining contractors, permittees, permit holders and operators, together with mining applicants, is expected to harmonize and streamline the entire reporting process related to mineral exploration results and translate to a more expeditious evaluation and development of mining projects.

SECTION 2. Objectives. This Order intends to achieve the following:

a. To establish a standard for reporting exploration results, mineral resources and mineral reserves based on the local industry and global standards;

b. To promote transparency, competence and professionalism in reporting exploration results, mineral resources and mineral reserves; and

c. To achieve worldwide compatibility in reporting exploration results, mineral resources and mineral reserves.

SECTION 3. Scope and Limitations. This Order shall cover the adoption of PMRC 2020 and in effect amending certain provisions of DENR Administrative Order No. 2010-09, as provided by Table 1 ("Annex A"), in a summary form, a list of the criteria which must be considered by the ACP when preparing a report on Exploration Results, Mineral Resources or Mineral Reserves.

The standards provided herein shall apply only to the solid and non-energy mineral resources of the country. This can include mineralized fill, remnants, pillars, low grade mineralization, stockpiles, dumps, and tailings (remnant materials) where there are reasonable prospects for eventual economic extraction in the case of Mineral Resources, and where extraction is reasonably justifiable in the case of Mineral Reserves.

To provide for more clarifications, the Mines and Geosciences Bureau (MGB) may formulate and issue the necessary Supplementary Implementing Guidelines for the guidance of all concerned.

SECTION 4. Definition of Terms and Acronyms. The following terms shall be defined as follows:

a. **Accredited Professional Organization or APO** refers to a professional organization in the field of geology, mining engineering or metallurgical engineering, namely, the Geological Society of the Philippines (GSP), Philippine Society of Mining Engineers (PSEM), or the Society of Metallurgical Engineers of the Philippines (SMEP), respectively, accredited by the Philippine Professional Regulation Commission (PRC).

b. **Accredited Competent Person or ACP** is a minerals industry professional who is a Member or Fellow of PSEM, GSP and/or SMEP, duly accredited as such by the professional organization to which he/she belongs, or of a Recognized Professional Organization (RPO), as included in a list promulgated by PSEM, GSP, and SMEP through the PMRCC, as the need arises, subject to applicable laws and regulations. He/she must have a minimum of five years relevant experience in the style of mineralization or type of mineral deposit under consideration and to the activity which that person is undertaking.

c. **Contractor** is a qualified person acting alone or in consortium who is a party to a Mineral Agreement or to a Financial or Technical Assistance Agreement.

d. **Feasibility study** is a comprehensive technical and economic study of the selected development option for a mineral project that includes appropriately detailed assessment of applicable Modifying Factors together with any other relevant operational factors and detailed financial analysis that are necessary to demonstrate at the time of reporting that extraction is reasonably justified (economically mineable). The results of the study may reasonably serve as the basis for a final decision by a proponent or financial institution to proceed with, or finance, the development of the project.

e. **MGB** refers to the Mines and Geosciences Bureau of the Department of Environment and Natural Resources.

f. **Mineral Resource** is a concentration or occurrence of solid material of economic interest in or on the Earth's crust in such form, grade (or quality), and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade (or quality), continuity, and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence, including sampling.

g. **Mineral Reserve** is the economically mineable part of a Measured and/or Indicated Mineral Resource. It includes diluting materials and allowances for losses, which may occur when the material is mined or extracted and is defined by studies at Pre-Feasibility or Feasibility level as appropriate that include application of Modifying Factors. Such studies demonstrate that, at the time of reporting, extraction could reasonably be justified.

h. **Modifying Factors** are considerations used to convert Mineral Resources to Mineral Reserves. These include but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social, and governmental factors.

i. **Permittee** is a holder of an Exploration Permit.

j. **Permit Holder** refers to a holder of a national government issued mining permit other than an Exploration Permit.

k. **Philippine Mineral Reporting Code (PMRC) or the Code** sets out minimum standards, recommendations and guidelines for Public Reporting in the Philippines of Exploration Results, Mineral Resources, and Mineral Reserves with its latest edition in 2020. The PMRC 2020 Edition is an upgrade of the PMRC 2007 Edition and modeled substantially after the International Reporting Template (2019) of the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) and the Australasian Code for Reporting of Exploration Results, Mineral Resources, and Ore Reserves (JORC Code) of the Australasian Joint Ore Reserves Committee (JORC).

CHAPTER II
SYSTEM OF CLASSIFICATION

SECTION 5. Reference to the Philippine Mineral Reporting Code 2020 Edition. The system of classification provided herein shall be guided by the local industry standards as contained in the Philippine Mineral Reporting Code (PMRC) of 2020.

Attached as Table 1 (Annex "A") and more as an integral part hereof is a revised checklist of assessment and reporting criteria in preparing reports on exploration results, mineral resources and mineral reserves.

SECTION 6. General Framework. The classification of exploration results, mineral resources and mineral reserves shall be guided by the stage or phase of mineral exploration, feasibility study and economic viability.

The evaluation of exploration results is succeeded by the assessment and categorization of the mineral resources to Inferred, Indicated and Measured. Feasibility Study can be done on a Measured Mineral Resource and/or Indicated Mineral Resource to ascertain if either or both can be classified as Probable and/or Proved Mineral Reserve. The state of economic viability of a mineral deposit is categorized as either economic or potentially economic.

CHAPTER III
REPORTING TERMINOLOGY

SECTION 7. Statements to be used in Reporting Prospecting and Preliminary Exploration Results. When reporting results of prospecting and preliminary exploration activities involving a mineralization that cannot be classified as mineral resource or mineral reserve owing to the insufficiency of data and thereby prevents the reasonable estimates of tonnage and average grade, such mineralization should be termed only as Exploration Target. The exploration report prepared by the ACP and submitted to MGB must contain sufficient information to allow a balanced judgment on the significance of the results. The ACP shall be guided by the list of particulars in Table 1 of the PMRC.

SECTION 8. Categories for Reporting Mineral Resources. Mineral Resources are subdivided, in order of increasing geological confidence, into Inferred, Indicated and Measured categories.

a. **Inferred Mineral Resource** is that part of a Mineral Resource for which quantity, and grade (or quality) are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify, geological and grade (or quality) continuity. It is based on information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that may be limited or of uncertain quality and reliability.

b. **Indicated Mineral Resource** is that part of a Mineral Resource for which quantity, grade (or quality), densities, shape, and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the mineral deposit. It is based on exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. The locations are too widely or inappropriately spaced to confirm geological and/or grade continuity but are spaced closely enough for continuity to be assumed. Geological evidence is derived from adequately detailed and reliable exploration, sampling, and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings, and drill holes, and is sufficient to assume geological and grade (or quality) continuity between points of observation.

c. **Measured Mineral Resource** is that part of a Mineral Resource for which quantity, grade (or quality), densities, shape and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support mine planning and final evaluation of the economic viability of the mineral deposit. Geological evidence is derived from detailed and reliable exploration, sampling, and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings, and drill holes, and is sufficient to confirm geological and grade (or quality) continuity between points of observation.

SECTION 9. Categories for Reporting Mineral Reserves. Mineral Reserve is sub-divided in order of increasing confidence into Probable and Proved Mineral Reserves:

a. **Probable Mineral Reserve** is the economically mineable part of an Indicated, and in some circumstances, a Measured Mineral Resource. The confidence in the Modifying Factors applying to a Probable Mineral Reserve is lower than that applying to a Proved Mineral Reserve.

b. **Proved Mineral Reserve** is the economically mineable part of a Measured Mineral Resource. A Proved Mineral Reserve implies a high degree of confidence in the Modifying Factors.

SECTION 10. Reporting of Exploration Results, Mineral Resources and Mineral Reserves to Government. Every contractor, permittee and permit holder shall be guided by the standards provided herein in complying with the reporting requirements of the Mining Act and its IRR.

SECTION 11. Administration of Mineral Resources and Mineral Reserves Database. Pursuant to the provision of Section 267 Department Administrative Order No. 2010-21, as amended, a Mineral Resources and Mineral Reserves database shall be established by the MGB and its Regional Offices to serve as a repository of all exploration and related data from mining projects for national and regional policy and planning studies, monitoring and research purposes. The MGB Central Office shall be the national repository of the said database.

All relevant data contained in reports on mineral resources and mineral reserves shall be recorded and incorporated in this database. Public access to this database shall be subject to existing policies on disclosure of information.

CHAPTER IV
RESPONSIBILITY OF REPORTING AND COMPILATION OF REPORTS

SECTION 12. Preparation of Reports on Exploration Results, Mineral Resources, Mineral Reserves and Other Reports. Exploration results, mineral resources and mineral reserves reports for public disclosure must be prepared by an ACP or ACPs. ACP Geologist(s) shall disclose reporting of exploration results and mineral resources. ACP Mining Engineer(s) shall disclose reporting of mineral reserves, and ACP Metallurgist Engineer(s) shall disclose reporting of metallurgical testworks which is a part of a Feasibility Study of a mineral project.

If only one ACP signs the Mineral Resource or Mineral Reserve documentation, that person is responsible and accountable for the whole documentation under the Code.

All reports on mineral resources and mineral reserves shall be signed and sealed by an ACP or ACPs with a sworn statement affirming that he/she/they personally undertook or reviewed the relevant evaluation process.

If a report is prepared by a team of professionals or experts, the team leader should be an ACP who is responsible and accountable for the whole report. If responsibility is shared by the team leader with other ACP, each team member shall clearly state the coverage or scope of his/her responsibility in the report. The team leader and his/her members shall jointly sign the sworn statement and affix their individual scopes of responsibility to the report. In this case, the ACPs in the team share the responsibility over their report.

SECTION 13. Qualifications of an Accredited Competent Person. Accredited Competent Person is defined in this Administrative Order as a technical professional or expert possessing the following qualifications:

a. Must be a Geologist, a Mining Engineer or a Metallurgical Engineer licensed by the PRC;

b. Must be a member in good standing of any of the APO and accredited by the APO's respective accreditation committees; and

c. Must have a minimum five (5) years relevant experience in the style of mineralization or type of mineral deposit under consideration and to the activity which that person is undertaking.

A foreign geologist, mining engineer and/or metallurgical engineer may also be qualified as an ACP if the following conditions are satisfied:

a. His/her professional organization has a reciprocal arrangement with the equivalent local accrediting professional organization/s; and

b. He/she is an Accredited Competent Person by his/her professional organization/s in his/her home country.

An ACP shall be required to obtain an accreditation of his/her professional and educational qualification and relevant working experience from the APO where he/she belongs. This accreditation shall certify that he/she is capable to perform mineral resources assessment based on his/her working experience and shall state the scope of his/her professional competency.

The APOs shall provide the MGB with a regular update of the roster of their Accredited Competent Persons.

CHAPTER V
MISCELLANEOUS PROVISIONS

SECTION 14. Transitory Provision

A period of two (2) years shall be provided as the transition phase upon approval of this Order. Provided, that an ACP can use the PMRC 2020 even during the transition period. Provided further that he/she cannot use the PMRC 2007 again on a resource/reserve/already reported using PMRC 2020. Provided finally, that he/she cannot mix both codes in reporting a resource/reserve/reactivity.

SECTION 15. Penal Provision. Any false statement, misrepresentation and/or misreporting in connection with the preparation and submission of reports on exploration results, mineral resources and/or mineral reserves shall be a ground for filing a perjury or fraud case against the Accredited Competent Person concerned. It shall also constitute a violation of the terms and conditions of the mining contract or permit concerned.

SECTION 16. Separability Clause. If any provision of this Order shall be held invalid or unconstitutional, the other portions or provisions hereof which are not affected shall continue in full force and effect.

SECTION 17. Repealing Clause. DENR Administrative Order No. 2010-09, "Providing for the Classification and Reporting Standards of Exploration Results, Mineral Resources and Ore Reserves", and other similar issuances inconsistent herewith are hereby revoked, amended, or modified accordingly.

SECTION 18. Effectivity. This Order shall take effect fifteen (15) days after its publication in a newspaper of general circulation and upon acknowledgment of the receipt of the copy thereof by the Office of the National Administrative Register (ONAR).

MARIA ANTONIA YULO LOYZAGA
Secretary

ANNEX A. TABLE 1 - REVISED CHECKLIST OF ASSESSMENT AND REPORTING CRITERIA

Table 1 provides, in a summary form, a list of the criteria which must be considered by the ACP when preparing a Public Report on Exploration Results, Mineral Resources or Mineral Reserves. In the context of complying with the principles of the Code, comments relating to the items in the relevant sections of Table 1 should be provided on an 'if not, why not' basis within the ACP's documentation.

			Exploration Results / Mineral Resources / Mineral Reserves
			Introduction
Introduction	**General**	(i)	The scope of work or terms of reference
		(ii)	The Accredited Competent Person's relationship to the issuer of the Public Report, if any
		(iii)	A statement for whom the Public Report was prepared, whether it was intended as a full or partial evaluation or other purpose, who conducted, effective date of Public Report, and remaining work
		(iv)	Sources of information and data contained in the Public Report or used in its preparation, with citations if applicable, and a list of references
		(v)	A title page and a table of contents that includes figures and tables
		(vi)	An Executive Summary, which briefly summarizes important information in the Public Report including mineral property description and ownership, geology and mineralization, the status of exploration, development and operations, Mineral Resource and/or Mineral Reserve estimates, and the Accredited Competent Person's conclusions and recommendations. If Inferred Mineral Resources are used, a summary valuation with and if practical default valuation of such Inferred Mineral Resources. The Executive Summary should have sufficient detail to allow the reader to understand the essentials of the project
		(vii)	A declaration from the Accredited Competent Person stating whether the declaration has been made in terms of the guidelines of the PMRC 2020 Edition. If a reporting code other than the PMRC being used on has been used an explanation of the differences
		(viii)	Diagrams, maps, plans, sections, and illustrations which are dated, legible, and prepared at an appropriate scale to adequately depict important features. Maps including a legend, author or information source, coordinate system and datum, a scale or bar or grid form, and an arrow indicating north. Reference to a location or index map and more detailed maps showing all important features described in the text, including all relevant cadastral and other infrastructure features
		(ix)	The units of measure, currency and relevant exchange rates
		(x)	The details of the personal inspection on the mineral property by each Accredited Competent Person or, if applicable, the reason why a personal inspection has not been completed
		(xi)	If the Accredited Competent Person is relying on a report, opinion or statement of another expert who is not an Accredited Competent Person, then a disclosure of the date, title, and author of the report, opinion or statement, the qualifications of the other expert, the reason for the Accredited Competent Person to rely on the other expert, any significant risks, and any steps the Accredited Competent Person took to verify the information provided
1.1	**Location**	1.1.1	Description of location and map (country, province, and closest town; city; coordinate systems and ranges, etc.)
		1.1.2	Country Profile, with a description of information relating to the project host country that is pertinent to the project, including relevant applicable legislation, environmental and social context, etc. An assessment, at a high level, of relevant technical, environmental, social economic, political, and other key risks
		1.1.3	A general topo-cadastral map [Topo-cadastral map: if sufficient detail to support the assessment of economics] [Detailed topo-cadastral map: applicable aerial surveys checked with ground controls and areas of rugged terrain or dense vegetation or high altitude]
1.2	**Mineral Property Description**	1.2.1	Brief description of the scope of project (i.e. whether in a preliminary sampling advanced exploration, Scoping, Pre-Feasibility, or Feasibility Study, Life-of-Mine plan for an ongoing mining operation or closure)
		1.2.2	Description of topography, elevation, drainage and vegetation, the means and route of access to the mineral property, the proximity of the mineral property to a population center and the nature of transport, the climate, known associated climatic and seismic risks and the length of the operating season and to the extent relevant to the mineral project, the sufficiency of surface rights for mining operations including the availability and sources of power, water, mining personnel, potential tailings storage areas, potential waste disposal areas, heap leach pad areas, and potential processing plant sites (noting any conditions that may affect possible exploration/mining activities)
1.3	**Adjacent properties**	1.3.1	Details of relevant adjacent properties. The inclusion on the maps of the location of claim/concession structures, whether related to mineralization or not, in adjacent or nearby properties having an important bearing on the Public Report. Reference to all information used from other sources
1.4	**History**	1.4.1	Historical background to the project and adjacent areas concerned, including known results of previous exploration and mining activities (type, amount, quantity, and development work); previous ownership and changes thereto
		1.4.2	Previous successes or failures in transparently with reasons why the project should now be considered potentially economic
		1.4.3	Known or existing historical Mineral Resource estimates and performance statistics from actual production in the past and in current operations
		1.4.4	[Known or existing historical Mineral Reserve estimates and performance statistics from actual production in the past and in current operations]
			A statement from the Accredited Competent Person on the confirmation of the legal tenure, including a description of
1.5	**Legal Aspects and Permitting**	1.5.1	The nature of the issuer's rights (e.g., exploration and/or mining) and the right to use the surface of the properties to which these rights relate. The date of expiry and other relevant details
		1.5.2	The principal terms and conditions of all existing agreements, and details of those still to be and obtained (such as, but not limited to, concessions, partnerships, joint ventures, access rights, leases, historical and cultural sites, wilderness or national park, and environmental settings, royalties, consents, permission, permits or authorizations)
		1.5.3	The security of the tenure held at the time of reporting or that is reasonably expected to be granted in the future along with any known impediments to obtaining the right to operate in the area. Details of applications that have been made. See Clause 32 for declaration of a Mineral Reserve
		1.5.4	A statement of any legal proceedings, for example adverse complaining claims, or legal claims that may have an influence on the rights to prospect or mine for minerals, or claims that the tenurial instrument is defective or an appropriate negative statement
		1.5.5	A statement relating to government/statutory requirements permits and consents as may be required, have been applied for, approved or can be reasonably be expected to be obtained. A review of risks that permits will not be received as expected and impact of delays to the project
1.6	**Royalties**	1.6.1	The royalties or streaming agreements that are payable in respect of each mineral property
1.7	**Liabilities**	1.7.1	Any liabilities, including rehabilitation guarantees and decommissioning obligations that are pertinent to the project. A description of the rehabilitation liability and decommissioning obligation, including, but not limited to, legislative/administrative requirements, assumptions, and limitations
			Section 1: Geological Setting, Mineral Deposit, Mineralization
2.1	**Geological Setting, Mineral Deposit, Mineralization**	2.1.1	The regional geology
		2.1.2	The project geology including mineral deposit type, geological setting and style of mineralization
		2.1.3	The geological model or concepts being applied in the investigation and on the basis of which the exploration program is planned, along with a description of the inferences and assumptions made from this model
		2.1.4	Data density, distribution and reliability and whether the quality and quantity of information are sufficient to support statements, made or inferred, concerning the mineral deposit
		2.1.5	Significant minerals present in the mineral deposit, their frequency, size and other characteristics, including a discussion of minor and gangue minerals where these will have an effect on the processing steps and the variability of each important mineral within the mineral deposit
		2.1.6	Significant mineralized zones encountered on the mineral property, including a summary of the surrounding rock types, relevant geological controls, and the length, width, depth and continuity of the mineralization, together with a description of the type, character, and distribution of the mineralization
		2.1.7	The existence of reliable geological and/or section maps and cross sections that support interpretations
			Section 2: Exploration and Drilling, Sampling Techniques, and Data
2.1	**Exploration**	3.1.1	Data acquisition or exploration techniques and the nature, level of detail, and confidence in the geological data used (i.e., geological observations, remote sensing results, stratigraphy, lithology, structure, alteration, mineralization, hydrology, geophysical, geotechnical, petrography, mineralogy, geochronology); bulk density, potential deleterious or contaminating substances, geotechnical and rock characteristics, moisture content, bulk samples, etc.). Data lists with all relevant metadata, such as unique sample number, sample mass, collection date, spatial location, etc.
		3.1.2	The primary data elements (observations and measurements) used for the project and a description of the management and verification of these data or the database. Description of the following relevant processes: acquisition (capture or transfer), validation, integration, control, storage, retrieval, and backup processes. If data are not stored digitally, presentation of hard-printed tables with well-organized data and information
		3.1.3	Acknowledgment and approval of data from other parties, and reference to all data and information used from other sources
		3.1.4	Distinction between data/information from the mineral property under discussion and that derived from surrounding properties
		3.1.5	The methods for data acquisition, survey, techniques, and expected accuracies of data as well as the grid system used
		3.1.6	Discussion on the sufficiency of the data spacing and distribution to establish the degree of geological and grade continuity appropriate for the estimation procedure(s) and classification(s) applied
		3.1.7	Presentation of representative models and/or maps and cross sections or other two or three-dimensional illustrations of results showing location of samples, accurate drill hole collar positions, down-hole surveys, exploration pits, underground workings, relevant geological data, etc.
		3.1.8	The geometry of the mineralization with respect to the drill hole angle because of the importance of this relationship between mineralization widths and intercept lengths
			Justification if very down-hole lengths are reported
2.2	**Drilling Techniques**	3.2.1	Type of drilling undertaken (e.g., core, reverse circulation, open hole hammer, rotary air blast, auger, Bangka, sonic, etc.) and details (e.g., core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.)
		3.2.2	The geological and geotechnical logging of core and chip samples relative to the level of detail required to support appropriate Mineral Resource estimation, mining studies, and metallurgical studies
		3.2.3	The nature of logging (quantitative or quantitative) and the size of core photography (for core/rock channel, etc.)
		3.2.4	The total length and percentage of the relevant intersections logged
		3.2.5	Results of any down-hole surveys of the drill hole
2.3	**Sample method, collection, capture, and storage**	3.3.1	A description of the nature and quality of sampling (e.g., cut channels, random chips, or specific specialized industry standard measurement tools appropriate to the minerals under investigation, such as down-hole gamma sondes, or handheld or fixed-position XRF instruments, etc.) without these examples limiting the broad meaning of sampling
		3.3.2	A description of the sampling processes, including sub-sampling stages to maximize representativeness of samples, whether sample sizes are appropriate to the grain size of the material being sampled and any sample compositing
		3.3.3	A description of each data set (e.g., geology, grade, density, quality, geo-metallurgical characteristics, etc.), sample type, sample selection, and collection methods
		3.3.4	The nature of the geometry of the mineralization with respect to the drill hole angle (if known). The orientation of sampling to achieve unbiased sampling of possible structures, considering the mineral deposit type / The down-hole lengths if the intersection angle is not known
		3.3.5	A description of retention policy and storage of physical samples (e.g., core, sample reject, etc.)
		3.3.6	A description of the method of recording and assessing core and chip sample recoveries and the results assessed, measures taken to maximize sample recovery and ensure representative nature of the samples, whether a relationship exists between sample recovery and grade, and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material
		3.3.7	The cutting of a drill core sample, e.g., whether it was split or sawn and whether quarter, half or full core was submitted for analysis. Non-core sampling, e.g., whether the sample was riffled, tube sampled, rotary split, etc., whether it was sampled wet or dry, the impact of water table or flow rates on recovery and introduction of sampling biases or contamination from above
			The impact of sample hole diameter, e.g., for the size of a caliper tool
3.4	**Sample Preparation and Analysis**	3.4.1	The identity of the laboratory(s) and its accreditation status
		3.4.2	The steps taken by the Accredited Competent Person to ensure the results from a non-accredited laboratory are of an acceptable quality
		3.4.3	The analytical method its nature, the quality and appropriateness of the assaying and laboratory processes and procedures used, and whether the technique is considered partial or total / A description of the process and method used for sample preparation, sub-sampling and size reduction, and the likelihood of inadequate contamination, screen sizes, granulometry, mass balance, etc.)
3.5	**Sampling Governance**	3.5.1	The governance of the sampling campaign and process, to ensure quality and representativeness of samples and data, such as sample recovery, high grading, selective losses or contamination; borehole diameter, internal and external QA/QC, and any other factors that may have resulted in or identified sample bias
		3.5.2	The measures taken to ensure sample security and the Chain of Custody
		3.5.3	The validation procedures used to ensure the integrity of the data, e.g., transcription, input or other errors, between its initial collection and its future use for modeling (e.g., geology, grade, bulk density, etc.)
		3.5.4	The audit process and frequency (including dates of these audits) and disclose any material risks identified
3.6	**Quality Control/ Quality Assurance**	3.6.1	The verification techniques (QA/QC) for field sampling process, e.g., the level of duplicates, blanks, reference material standards, process audits, analysis, etc. Indirect methods of measurement (e.g., geophysical methods), with attention given to the confidence of interpretation / Reference to measures taken to ensure sample representativeness and the appropriate calibration of any measurement tools or systems used. QA/QC procedures used to check databases augmented with new data have not disturbed previous versions confirming old data
3.7	**Bulk Density**	3.7.1	The method of bulk density determination with reference to the frequency of measurements, the size, nature, and representativeness of the samples
		3.7.2	Preliminary estimates or basis of assumptions made for bulk density
		3.7.3	The representativeness of bulk density samples
		3.7.4	The measurement of bulk density for bulk material using methods that adequately account for void spaces (vugs, porosity, etc.), moisture, and differences between rock and alteration zones within the mineral deposit
3.8	**Bulk Sampling and/or trial mining**	3.8.1	The location of individual samples (including map)
		3.8.2	The size of samples, spatial density of samples recovered, and whether sample sizes and distribution are appropriate to the grain size of the material being sampled
		3.8.3	The method of mining and treatment
		3.8.4	The degree to which the samples are representative of the various types and styles of mineralization and the mineral deposit as a whole

Section 4: Estimation and Reporting of Exploration Results and Mineral Resources

4.1	**Geological model and interpretation**	4.1.1	The nature, detail, and reliability of geological information with which lithological, structural, mineralogical, alteration or other geological, geotechnical, and geo-metallurgical characteristics were recorded.	
		4.1.2	The geological model, construction technique, and assumptions that form the basis for the Exploration Results or Mineral Resource estimate. The sufficiency of data density to assure continuity of mineralization and geology, and provision of an adequate basis for the estimation and classification procedures applied.	
		4.1.3	Any obvious geological, mining, metallurgical, processing, environmental, social, infrastructural, legal, and economic factors that could have a significant effect on the prospects of any possible Exploration Target or Mineral deposit.	
		4.1.4		Geological data that could materially influence the estimated quantity and quality of the Mineral Resource or Mineral Reserve.
		4.1.5	Consideration given to alternative interpretations or models and their possible effect (or potential risk), if any, on the Mineral Resource estimate.	
		4.1.6	Geological discounts (e.g., magnitude, per reef, domain, etc.), applied in the model, whether applied to mineralized and/or unmineralized material (e.g., potholes, faults, dikes, etc.).	
4.2	**Estimation and modeling techniques**	4.2.1	A detailed description of the estimation techniques and assumptions used to determine the grade and tonnage ranges for Exploration Targets.	Histograms, statistical parameters, probability distributions or samples, and of block estimates. If geostatistics is done, must show variogram(s) and parameters (e.g., sill, range, nugget effect) depending on variogram type, area of estimation panels or blocks, assumed or known selective mining units.
		4.2.2	The nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values (cutting or capping), compositing (including by length and/or density), domaining, sample spacing, estimation unit size (block size), selective mining units, interpolation parameters, and maximum distance of extrapolation from data points.	
		4.2.3	Assumptions and justification of correlations made between variables.	
		4.2.4	Any relevant specialized computer program (software) used (with the version number) together with the parameters used.	
		4.2.5	The processes of checking and validation, the comparison of model information to sample data and use of reconciliation data, and whether the Mineral Resource estimate takes account of such information.	
		4.2.6	The assumptions made regarding the estimation of any co-products, by-products or deleterious elements.	
4.3	**Reasonable prospects for eventual economic extraction**	4.3.1	The geological parameters, including (but not be limited to) volume/tonnage, grade and value/quality estimates, cut-off grades, strip ratios, upper- and lower- screen sizes.	
		4.3.2	The engineering parameters, including mining method, processing, geotechnical, hydrogeological, and metallurgical parameters, including assumptions made to mitigate the effect of deleterious elements. Dilution and mining recovery factors that might be applicable to convert in-situ Mineral Resources to Mineral Reserves.	
		4.3.3	The infrastructure including, but not limited to, power, water, and site access.	
		4.3.4	The legal, governmental, permitting, and statutory parameters.	
		4.3.5	The environmental and social (or community) parameters.	
		4.3.6	The marketing parameters.	
		4.3.7	The economic assumptions and parameters, including, but not limited to, commodity prices, sales volumes, and potential capital and operating costs.	
		4.3.8	Material risks, e.g. legal, environmental, climatic, etc.	
		4.3.9	The parameters used to support the concept of 'eventual' in the case of Mineral Resources.	
4.4	**Classification Criteria**	4.4.1	The criteria and methods used as the basis for the classification of the Mineral Resources into varying confidence categories.	
4.5	**Discussion of relative accuracy/confidence**	4.5.1	Where appropriate, a statement of the relative accuracy and confidence level in the Mineral Resource or Mineral Reserve estimate using an approach or procedure deemed appropriate by the Accredited Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the Mineral Resource or Mineral Reserve within stated confidence limits, or, if such an approach is not deemed appropriate, a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate. The statement should specify whether it relates to global or local estimates, and, if local, state the relative tonnages, which should be relevant to technical and economic evaluation. Documentation shall include assumptions made and the procedures used. These statements of relative accuracy and confidence of the estimate should be compared with production data, where available.	
4.6	**Reporting**	4.6.1	Specific grades/ qualities and widths.	
		4.6.2	The reporting of low- and high grade intersections and corresponding widths, together with their spatial location to avoid misleading reporting of Exploration Results.	
		4.6.3	A statement on whether grades are regional averages or if these are selected individual samples taken from the mineral property under discussion.	
		4.6.4		The detail of the surface or underground mine, residue stockpile, remnants, tailings, and existing pillars or other sources in a Mineral Resource statement.
		4.6.5		A comparison with the previous Mineral Resource estimates, with an explanation of the reason for material changes. A comment on any historical trends (e.g. global bias).
		4.6.6		The basis for the estimate and if not 100%, the attributable percentage relevant to the entity commissioning the Public Report.
		4.6.7	The basis of equivalent metal formulae, if relevant	

Section 5: Technical Studies

5.1	**Introduction**	5.1.1	The level of study – Scoping, Pre-Feasibility, Feasibility, or ongoing Life-of-Mine Plan.	The level of study – Feasibility, Feasibility or ongoing Life-of-Mine Plan.
		5.1.2		A summary table of the Modifying Factors used to convert the Mineral Resource to Mineral Reserve.
		5.2.1	Assumptions regarding mining methods and parameters when estimating Mineral Resources	
5.2	**Mining Design**	5.2.2		All Modifying Factors and assumptions made regarding mining methods, minimum mining dimensions (or pit shell) and internal and, if applicable, external planned and unplanned mining dilution and mining losses used for the techno economic study and signed-off, such as mining method, mine design, capacities, production schedule, mining efficiencies, grade control, geotechnical

		5.2.3		and hydrological considerations, closure plans, and requirements.
		5.2.4	The basis of the cut-off grade(s)	Mineral Resource models used in the study. The basis of (the adopted) cut off grade(s) or quality parameters applied, including metal equivalents if relevant.
		5.2.5		The mining method(s) to be used.
		5.2.6		For open cut mines, a discussion of pit slopes, slope stability, and strip ratio.
		5.2.7	Not applicable to Exploration Results or Exploration Targets	For underground mines, a discussion of mining method, geotechnical considerations, mine design characteristics, and ventilation/cooling requirements.
		5.2.8		Discussion of mining rate, equipment selected, grade control methods, geotechnical and hydrogeological considerations, health and safety of the workforce, staffing requirements, dilution, and recovery.
		5.2.9		Optimization methods and software used in planning, including a discussion of the constraints.
5.3	**Metallurgical Testworks**	5.3.1	Not applicable to Exploration Results or Exploration Targets	The source of the samples, the representativeness of the potential feed and the techniques used to take the samples, laboratory and metallurgical testing techniques.
		5.3.2		The basis for assumptions or predictions regarding metallurgical amenability and any preliminary mineralogical test work should already be carried out.
		5.3.3	The possible processing methods and any processing factors that could have a material effect on the likelihood of eventual economic extraction. The appropriateness of the processing methods to the style of mineralization.	The processing method(s), equipment, plant capacity, efficiencies, and personnel requirements.
		5.3.4		The nature, amount, and representativeness of metallurgical test works undertaken and the recovery factors used. A detailed flow sheet/diagram and a mass balance, especially for multi-product operations from which the saleable materials are priced for different chemical and physical characteristics.
		5.3.5		Assumptions or allowances made for deleterious elements or the absence of any bulk sample or pilot-scale test work and the degree to which such samples are representative of the ore body as a whole.
		5.3.6		Disclosure of whether metallurgical process is well-tested technology or novel in nature and if novel, justification of its use in Mineral Resource estimation.
5.4	**Infrastructure**	5.4.1	Comment regarding the current state of infrastructure or the ease with which the infrastructure can be provided or accessed and its effect on reasonable prospects for eventual economic extraction.	Demonstration that the necessary facilities have been allowed for (which may include, but not be limited to, processing plant, tailings dam, leaching facilities, waste dumps, road, pipeline, rail or port facilities, water and power supply, offices, housing, security, resource sterilization testing, etc.). Provision of detailed maps showing locations of facilities.
		5.4.2	Not applicable to Exploration Results or Exploration Targets	
		5.4.3		Statement showing that all necessary logistics have been considered.
5.5	**Environmental and social**	5.5.1		Confirmation that the company holding the tenement has addressed the host country's environmental legal compliance requirements and any mandatory and/or voluntary standards or guidelines to which the company subscribes.
		5.5.2		Identification of the necessary permits that will be required and their status, and where not yet obtained, and confirmation that there is a reasonable basis to believe that all permits required for the project will be obtained in a timely manner.
		5.5.3		Any sensitive areas that may affect the project as well as any other environmental factors including Interested and Affected Party (I&AP) and/or studies that could have a material effect on the likelihood of eventual economic extraction. Possible means of mitigation.
		5.5.4		Legislated social management programs that may be required and content and status of these.
		5.5.5		Material socio-economic and cultural impacts that need to be managed, and where appropriate the associated costs.
5.6	**Market Studies and Economic criteria**	5.6.1	Technical and economic factors likely to influence the prospect of economic extraction. Refer to Clause 23	Valuable and potentially valuable product(s) including saleability of products, co-products and by-products to market.
		5.6.2	Not applicable to Exploration Results or Exploration Targets	Product to be sold to customer specifications, testing, and acceptance requirements. Existence of a ready market for the product and whether contracts for the sale of product are in place or expected to be readily obtained. Price and volume forecasts and the basis for the forecast.
		5.6.3		Economic criteria used for the study such as capital and operating costs, exchange rates, revenue/price curves, royalties, and streaming agreements, cut-off grades, reserve pay limits. Summary description, source, and confidence of method used to estimate the commodity price/value profiles used for cut off grade calculation, economic analysis and project valuation, including applicable taxes, inflation indices,

Section 6: Estimation and Reporting of Mineral Reserves

		5.6.5		discount rate, and exchange rates. Assumptions made concerning production cost including transportation, treatment, penalties, exchange rates, marketing and other costs. Allowances should be made for the content of deleterious elements and the cost of penalties
		5.6.6		Allowances made for royalties and streaming agreements payable, both to Government and private entities.
		5.6.7		Ownership, type, extent, and condition of plant and equipment that is significant to the existing operation(s).
		5.6.8		Environmental, social, and labor costs.
5.7	**Risk Analysis**	5.7.1	An assessment of technical, environmental, social, economic, political, and other key risks to the project. Actions that will be taken to mitigate and/or manage the identified risks.	
5.8	**Economic Analysis**	5.8.1	Not applicable to determined Results or Exploration Targets	The basis on which reasonable prospects for eventual economic extraction has been determined. Any material assumptions made in determining the reasonable prospects for eventual economic extraction. The inclusion of any Inferred Mineral Resources is not allowed in the Pre-Feasibility and Feasibility Studies economic analysis.
		5.8.2		An economic analysis for the project that includes after tax Cash Flow forecast on an annual basis using Mineral Resources or Mineral Reserves or an annual production schedule for the life of the project, which has been used at the relevant level Pre-Feasibility or Feasibility Study. Accounting for royalties and streaming agreements.
		5.9.3		A discussion of net present value (NPV), internal rate of return (IRR) and payback period of capital.
		5.8.4		Sensitivity or other analysis using variants in commodity price, grade, capital and operating costs, or other significant parameters, as appropriate and discuss the impact of the results.

Section 6: Estimation and Reporting of Mineral Reserves

6.1	**Estimation and modeling techniques**	6.1.1		A description of the Mineral Resource estimate used as a basis for the conversion to a Mineral Reserve.
		6.1.2		A Mineral Reserve Statement in sufficient detail indicating if the mining is by surface or underground method plus the source and type of mineralization, domain or orebody, surface dumps, stockpiles, and all other sources.
		6.1.3		Reconciliation of historical reliability and reconciliation of the performance parameters, assumptions and modifying factors. A comparison with the previous Reserve quantity and qualities, if available. Where appropriate, any historical trends (e.g. global bias).
		6.1.4		Criteria and methods used as the basis for the classification of the Mineral Reserves into varying confidence categories, which should be based on the Mineral Resource category, and include consideration of the confidence in all the Modifying Factors.
6.2	**Classification Criteria**	6.2.1		Criteria and methods used as the basis for the classification of the Mineral Reserves into varying confidence categories, which should be based on the Mineral Resource category, and include consideration of the confidence in all the Modifying Factors.
6.3	**Reporting**	6.3.1		The proportion of Probable Mineral Reserves, which have been derived from Measured Mineral Resources (if any), including the reason(s) thereof.
		6.3.2		The inclusion in a Mineral Reserve statement of the detail of the surface or underground mine, residue stockpile remnants, tailings, and existing pillars or other sources.
		6.3.3		A comparison with the previous Mineral Reserve estimates. Any historical trends (e.g. global bias).
		6.3.4		The inclusion or exclusion of Mineral Resources in Mineral Reserves.

Section 7: Audits and Reviews

7.1	**Audits and Reviews**	7.1.1	Type of review/audit (e.g. independent, external, etc.) (e.g., laboratory, drilling, data, environmental compliance, etc.), date and name of the reviewer(s) together with their recognized professional qualifications. The level of review/audit (desk-top, on-site comparison with standard procedures, or endorsement where auditor/reviewer has checked the work to the extent they stand behind it as if it were their own work).
		7.1.2	The level and conclusions of relevant audits or reviews. Significant deficiencies and remedial actions required.

Section 8: Other Relevant Information

8.1	**Other relevant information**	8.1.1	Other relevant and material information not discussed elsewhere.

Section 9: Accredited Competent Person

9.1	**Qualification of Accredited Competent Person(s) and key technical staff**	9.1.1	The full name of the Accredited Competent Person, profession, address, their PRC and Accredited Competent Person registration numbers and the name of the professional representative organization (or RPO), of which the Accredited Competent Person(s) is member. The relevant experience of the Accredited Competent Person(s) and other key technical staff who prepared and who are responsible for the Public Report.
	Relationship to the issuer	9.1.2	The Accredited Competent Person's relationship to the issuer of the Public Report, if any.
		9.1.3	The inclusion of the Accredited Competent Person's Consent Form (see Appendices 3 & 4). Such Consent Form should include the date of sign-off and the effective date of the Public Report.

* Mineral Reserve replaced the term "Ore Reserve" as referred in PMRC 2007 edition and DENR Administrative Order No. 2010-09 in accordance with the CRIRSCO International Template Reporting 2019, one of the internationally recognized reporting standards to which the PMRC 2020 was modeled after

(PDI – May 17, 2023)