

## OPERATION

### 001: NATURAL RESOURCES SUSTAINABLY MANAGED - PROGRAM 1: MINERAL RESOURCES AND GEOSCIENCES DEVELOPMENT PROGRAM

#### A.03.B Mineral Resources Development

##### A.03.B.1 Communication Plan for Mineral Resources and Geosciences Development

In its efforts to strengthen the Information, Education and Communication campaign in Caraga Region, the Mines and Geosciences Bureau Regional Office No. XIII formulated the Communication Plan for minerals development. It is designed in such a way that it will make the presence and relevance of mining felt in the communities and the entire region as an active partner in sustainable development and responsible mining. The Caraga minerals industry aims to cultivate harmonious and collaborative partnerships with different sectors such as other government agencies, local government units, academe, civil society organizations and the media in order to further intensify the advocacies of the industry.

The Mines and Geosciences Bureau Regional Office No. XIII works together with various industry organizations such as the Chamber of Mines of Caraga Region, Inc.; the Caraga Mine Environmental Management Council, Inc.; the Community Relations, Education and Development Officers Organization-Caraga, Inc. and the Caraga Mine Safety and Health Council in order to intensify public awareness of the current state of Caraga minerals industry and accomplish the following objectives of the Communication Plan:

- Intensify public awareness and support to the Caraga minerals industry;
- Conduct efficient and enhanced information drive on geohazards, calamities and climate change; and
- Provide a baseline data on the socioeconomic profile of mining communities in a five-year period.

For CY 2021, the Communication Plan utilized tools such as print and broadcast media in various forms such as press releases, radio programs, website, fora, social media and media dialogues involving the different stakeholders of the minerals industry. The Communication Plan of the Mines and Geosciences Bureau Regional Office No. XIII was complemented by the Communication Plan of Caraga mining firms for their respective areas of jurisdiction. Undeterred by the current pandemic, the Mines and Geosciences Bureau Regional Office No. XIII has worked together with the Philippine Information Agency (PIA) Caraga Regional Office and a number of regional media outfits in order to communicate the programs and activities of the Caraga minerals industry to the public.

PERFORMANCE INDICATOR	TARGET	ACCOMPLISHMENT	%
<b>Conduct of Awareness and Advocacy on Mineral Resources and Geosciences (MRGD)</b>			
Stakeholder's forum (no.)			
Dialogue with Sangguniang Panlalawigan/ Bayan/ Panlungsod/Barangay/ other groups (Religious groups, CSO, academe, etc.)	1	1	100%
Radio/TV guestings (no.)	2	2	100%
Press releases/photo releases/feature stories (no.)	24	24	100%

PERFORMANCE INDICATOR	TARGET	ACCOMPLISHMENT	%
<b>Generate information/Publish and disseminate IEC materials</b>			
Website and Social media (Facebook/Youtube/Twitter/Instagram) maintained/monitored (no.)	2	2	100%
Articles Posted in website and social media (no.)	24	27	113%
IEC materials/collaterals (caps, t-shirts, masks, etc.) produced/ reproduced/distributed (including climate change) (no.)	500	500	100%
Statistics reports submitted to MGBCO (no.)	33	33	100%
Maps/Map Info Database submitted to MGBCO (no.)	24	24	100%
MRGD reports submitted to MGBCO (no.)	35	35	100%
<b>Capacity Building Program on MRGD</b>			
Trainings/ webinar conducted/ coordinated/ participated to attend (no.)			
1. MGB Personnel	3	3	100%
2. LGUs and Other Stakeholders	1	1	100%
3. Small Scale Miners	2	2	100%
<b>National Linkages</b>			
Linkages coordinated (no.)	12	12	100%

The detailed Communication Plan for Minerals Development Report is as follows:

### **Conduct Awareness and Advocacy on Mineral Resources and Geosciences (MRGS)**

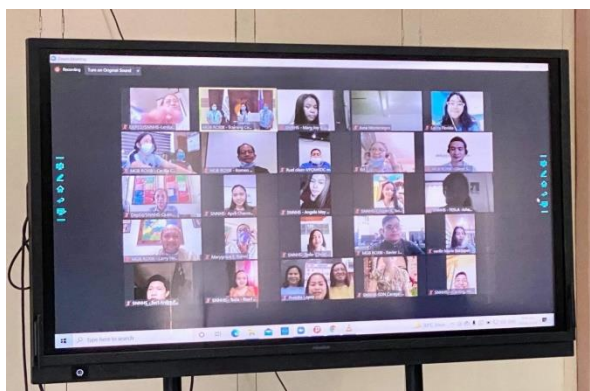
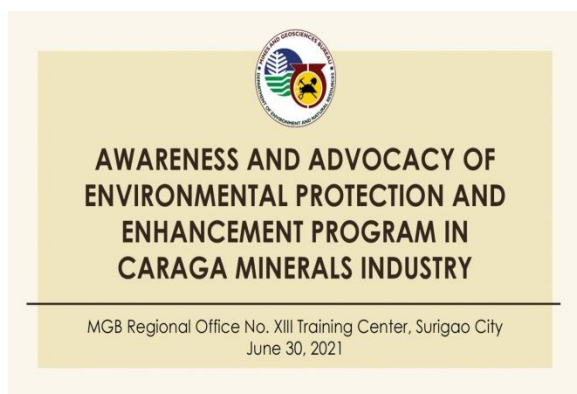
#### **Stakeholder's Forum**

##### **1) Dialogues with Sangguniang Panlalawigan/Bayan/Panlungsod/Barangay**

Date of Activity	Title of Activity	Target Audience

##### **2) Dialogues with other groups (Religious groups, CSO, academe, etc.)**

Date of Activity	Title of Activity	Target Audience
June 30, 2021	Awareness and Advocacy of Environmental Protection and Enhancement Program in Caraga Minerals Industry via Zoom Platform	Thirty (30) Senior and Junior High School Science Teachers and thirty (30) Senior and Junior High School Science Technology and Engineering Students of Surigao del Norte National High School



The Mines and Geosciences Bureau Regional Office No. XIII conducted the Virtual Information, Education and Communication Campaign entitled *Awareness and Advocacy of Environmental Protection and Enhancement Program in Caraga Minerals Industry* on June 30, 2021 via Zoom Platform.

## IEC Activities (Multi-media Campaign)

### 1) Radio/TV guestings

Date of Activity	Title of Activity	Target Audience
April 8, 2021	<i>Katilingban ug Kinaiyahan</i> Radio Program aired on DXKS-RPN (Radyo Ronda) with Mr. Elecito E. Escuyos Topic: <i>Updates on the Programs, Projects and Activities under the Social Development and Management Program of Caraga mining companies</i>	Caraga Region Populace
October 21, 2021	<i>Katilingban ug Kinaiyahan</i> Radio Program aired on DXKS-RPN (Radyo Ronda) with Ms. Marie Penelope E. Fang Topic: <i>Caraga Mine Visit of Department of Environment and Natural Resources Assistant Secretary for Finance, Information Systems and Mining Concerns, Engr. Nonita S. Caguioa, International E-Waste Day, and Republic Act No. 11313, otherwise known as Safe Spaces Act</i>	Caraga Region Populace

## 2) Press releases/photo releases/feature stories

Date published/submitted	Title of Article
January 30, 2021	<i>CMEMCI, MGB ROXIII hold Turnover Ceremony and Induction of CMEMCI Officers</i> (Press Release)
January 30, 2021	<i>Philippine Red Cross Molecular Laboratory in Surigao del Norte: A Story of Cooperation in Victory and Development</i> (Press Release)
February 25, 2021	<i>PMRB Agusan del Norte convenes Regular Meeting</i> (Press Release)
March 11, 2021	<i>JOGMEC Online Program for Mine Pollution Control: Strengthening cooperation between Japanese and Philippine mining sectors</i> (Press Release)
March 31, 2021	<i>The Mines and Geosciences Bureau conducted the FY 2022 Budget Proposal Workshop via digital platform on March 3-5, 2021. The said workshop aimed to ensure the preparation and timely submission of the MGB Budget Proposal for FY 2022 to the Department of Budget and Management.</i> (Photo Release)
April 16, 2021	<i>MGB ROXIII attends Ceremonial Groundbreaking to kick off construction of Cagdianao National High School</i> (Press Release)
April 16, 2021	<i>The Mines and Geosciences Bureau Regional Office No. XIII attended the Ceremonial Groundbreaking to kick off the construction of Cagdianao National High School on March 24, 2021 in Barangay Cagdianao, Claver, Surigao del Norte. MGB Caraga Regional Director Glenn Marcelo C. Noble took part in the event which comprised the signing of the Memorandum of Agreement, ceremonial groundbreaking and tree planting at the proposed site. Aimed at the promotion of optimal learning, the project will be funded through the Annual Social Development and Management Program of Taganito HPAL Nickel Corporation. The school building will be constructed in three phases and is expected to cater to approximately 400 learners and 13 teachers in Barangay Cagdianao.</i> (Photo Release)
April 27, 2021	<i>MGB ROXIII takes part in turnover ceremony of Bagakay Mangrove Tourism Trail and Aquaculture Projects</i> (Press Release)
May 14, 2021	<i>DENR organizes Learning Event on the Establishment of Bamboo Plantation in Mining Areas</i> (Press Release)
May 18, 2021	<i>DENR Caraga holds MGB Regional Director Turnover Ceremony</i> (Press Release)
May 28, 2021	<i>MGB conducts Workshop on Standardization of Regional Monitoring System</i> (Press Release)

June 30, 2021	<i>2021 DENR-MGB Stakeholders' Forum: Strengthening policies and partnerships in the minerals industry</i> (Press Release)
July 26, 2021	<i>2021 Environment Month Celebration of the Caraga minerals industry: Creating transformative impacts toward ecological restoration</i> (Press Release)
July 30, 2021	<i>MGB strengthens communications toward a better normal</i> (Press Release)
August 23, 2021	<i>MGB ROXIII plays a part in 24<sup>th</sup> Caraga Business Conference</i> (Press Release)
September 9, 2021	<i>MGB spearheads Virtual and Offsite SHES and Management Systems Audit of Caraga mining firms</i> (Press Release)
September 13, 2021	<i>Ceremonial Groundbreaking and Contract Signing for the Enhancement of the Caraga Regional Wildlife Rescue Center: Fostering wildlife preservation</i> (Press Release)
September 30, 2021	<i>MGB ROXIII attends inauguration and ceremonial turnover of Family Life and Livelihood Training Center</i> (Press Release)
October 12, 2021	<i>DENR Assistant Secretary Joan Lagunda interfaces with MGB ROXIII</i> (Press Release)
October 12, 2021	<i>MGB holds Information and Communications Technology Strategic Planning Workshop for FY 2022-2025</i> (Press Release)
October 12, 2021	<i>DENR Assistant Secretary Nonita Caguioa visits Surigao del Norte Mines</i> (Press Release)
November 19, 2021	<i>PMRB Agusan del Sur and Contract Holders sign Small-scale Mining Contracts</i> (Press Release)
November 25, 2021	<i>MGB ROXIII, CREDO Caraga, Inc. sign Memorandum of Agreement on Caraga Mining and Geosciences Library</i> (Press Release)
November 29, 2021	<i>Caraga MRFC Meetings and MMT Inspections: Pressing on with public service amidst the pandemic</i> (Press Release)

## Capacity Building on MRGS Laws, Rules & Regulations

### 1) Workshops/training conducted/coordinated for/participated in by MGB personnel

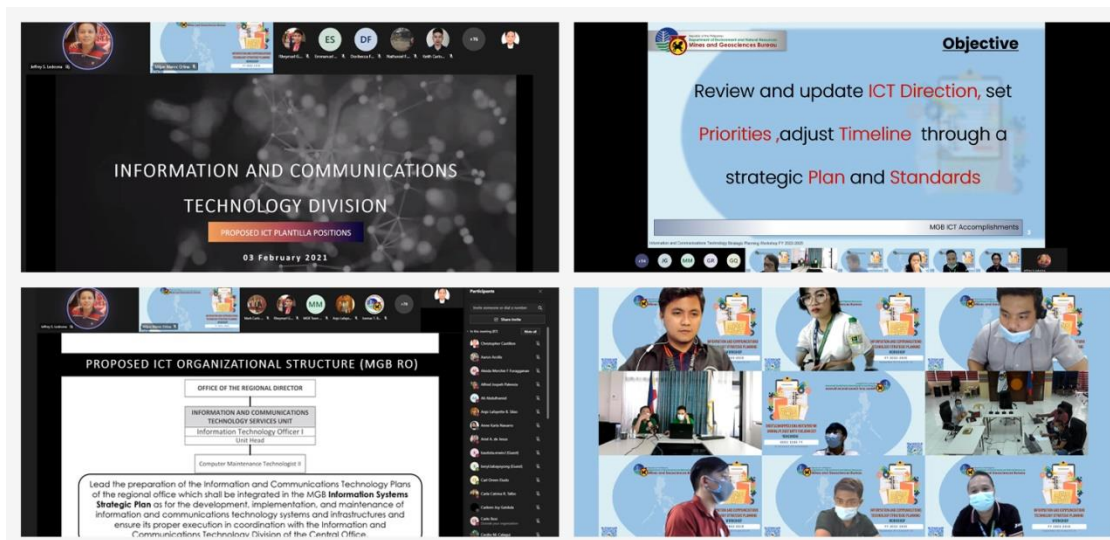
Date of Activity	Title of Activity	Target Audience
February 5-22, 2021	JOGMEC Online Program for Mine Pollution Control	Technical personnel from MGB Central Office, MGB Regional Offices, Environmental Management Bureau, Forest Management Bureau, Biodiversity Management Bureau and Ecosystems Research and



		Development Bureau
June 24-25, 2021	42nd Annual National Convention and Webinar of the Government Association of Certified Public Accountants, Inc.	Certified Public Accountants
September 20-21 and 23-24, 2021	Information and Communications Technology Strategic Planning Workshop for FY 2022-2025	Information Technology Personnel, Information and Communications Technology Focal Persons, Planning Officers, Budget Officers, Property Custodians, Heads of Bids and Awards Committee Secretariat, Document Controllers, Information Technology Specialists and Computer Maintenance Technologists



In line with the Memorandum of Cooperation by and between the Ministry of Economy, Trade and Industry through the Japan Oil, Gas and Metals National Corporation (JOGMEC) and the Department of Environment and Natural Resources (DENR) through the Mines and Geosciences Bureau (MGB) in 2019, the JOGMEC Online Program for Mine Pollution Control was conducted on February 5-22, 2021.



The Mines and Geosciences Bureau held a four-day Information and Communications Technology Strategic Planning Workshop for FY 2022-2025 on September 20-21 and 23-24, 2021 through the MGB Virtual Platform, Microsoft Teams.

## 2) Workshops/trainings conducted/coordinated for LGUs and other stakeholders

Date of Activity	Title of Activity	Target Audience
June 30, 2021	Awareness and Advocacy of Environmental Protection and Enhancement Program in Caraga Minerals Industry via Zoom Platform	Officials of Barangay Washington, Surigao City

## 3) Workshops/trainings conducted/coordinated for Small-scale Miners

Date of Activity	Title of Activity	Target Audience
June 30, 2021	Awareness and Advocacy of Environmental Protection and Enhancement Program in Caraga Minerals Industry via Zoom Platform	Selected personnel of Masabong Village Small-Scale Mining Association, Inc. and Brgy. Sta. Cruz Small-Scale Mining Association, Inc. in Rosario, Agusan del Sur

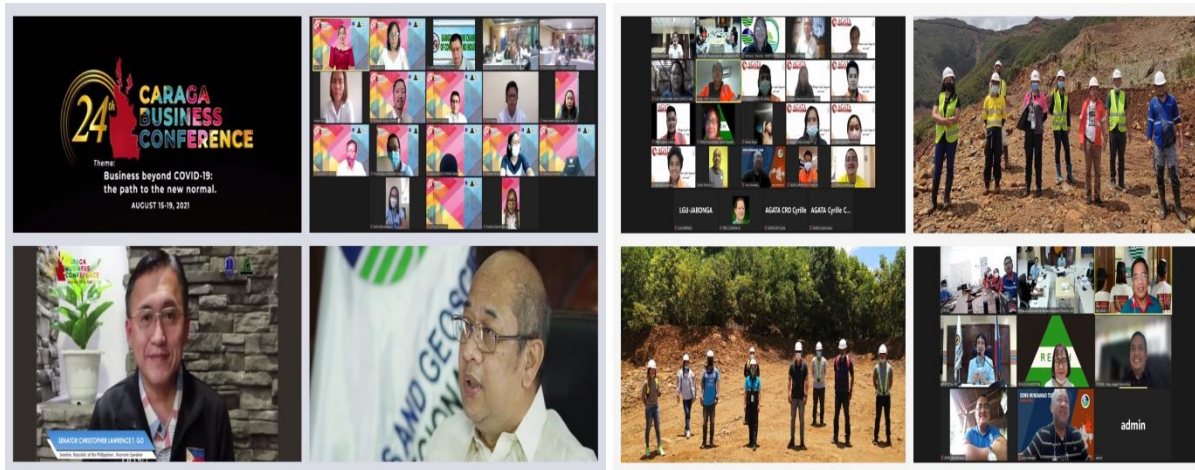
## Generate/Publish/Disseminate Information & IEC Materials

### 1) Articles published/posted

Date published/posted	Title of Article
January 30, 2021	<i>CMEMCI, MGB ROXIII hold Turnover Ceremony and Induction of CMEMCI Officers</i>
January 30, 2021	<i>Philippine Red Cross Molecular Laboratory in Surigao del Norte: A Story of Cooperation in Victory and Development</i>
February 24, 2021	<i>PMRB Agusan del Norte convenes Regular Meeting</i>
March 11, 2021	<i>JOGMEC Online Program for Mine Pollution Control: Strengthening cooperation between Japanese and Philippine mining sectors</i>
March 31, 2021	<i>Caraga minerals industry gains distinctions</i>
April 16, 2021	<i>MGB ROXIII attends Ceremonial Groundbreaking to kick off construction of Cagdianao National High School</i>
April 29, 2021	<i>MGB ROXIII takes part in turnover ceremony of Bagakay Mangrove Tourism Trail and Aquaculture Projects</i>
May 14, 2021	<i>DENR organizes Learning Event on the Establishment of Bamboo Plantation in Mining Areas</i>
May 16, 2021	<i>DENR Caraga holds MGB Regional Director Turnover Ceremony</i>
May 28, 2021	<i>MGB conducts Workshop on Standardization of Regional Monitoring System</i>
June 12, 2021	<i>2021 DENR-MGB Stakeholders' Forum: Strengthening policies and partnerships in the minerals industry</i>
June 30, 2021	<i>MGB ROXIII Virtual IEC Campaign: Intensifying awareness of Environmental Protection and Enhancement Program in Caraga minerals industry</i>
July 16, 2021	<i>2021 Environment Month Celebration of the Caraga minerals industry: Creating transformative impacts toward ecological restoration</i>
July 31, 2021	<i>MGB strengthens communications toward a better normal</i>
August 20, 2021	<i>MGB ROXIII plays a part in 24<sup>th</sup> Caraga Business Conference</i>
September 8, 2021	<i>MGB spearheads Virtual and Offsite SHES and Management Systems Audit of Caraga mining firms</i>
September 13, 2021	<i>Ceremonial Groundbreaking and Contract Signing for the Enhancement of the Caraga Regional Wildlife Rescue Center: Fostering wildlife preservation</i>
September 30, 2021	<i>MGB ROXIII attends inauguration and ceremonial turnover of Family Life and Livelihood Training Center</i>
October 12, 2021	<i>DENR Assistant Secretary Joan Lagunda interfaces with MGB ROXIII</i>
October 12, 2021	<i>MGB holds Information and Communications Technology Strategic Planning Workshop for FY 2022-2025</i>
October 12, 2021	<i>DENR Assistant Secretary Nonita Caguioa visits Surigao del Norte Mines</i>
November 19, 2021	<i>PMRB Agusan del Sur and Contract Holders sign Small-scale Mining Contracts</i>
November 25, 2021	<i>MGB ROXIII, CREDO Caraga, Inc. sign Memorandum of Agreement on Caraga Mining and Geosciences Library</i>



November 30, 2021	<i>Caraga MRFC Meetings and MMT Inspections: Pressing on with public service amidst the pandemic</i>
December 3, 2021	<i>MGB ROXIII spearheads SHES Manual Roll-out</i>
December 5, 2021	<i>MGB Stakeholders' Forum: Strengthening partnerships and fostering national progress</i>
December 15, 2021	<i>MGBEA Region XIII Chapter holds Webinar on Instilling Accountability and Integrity in Civil Servants</i>



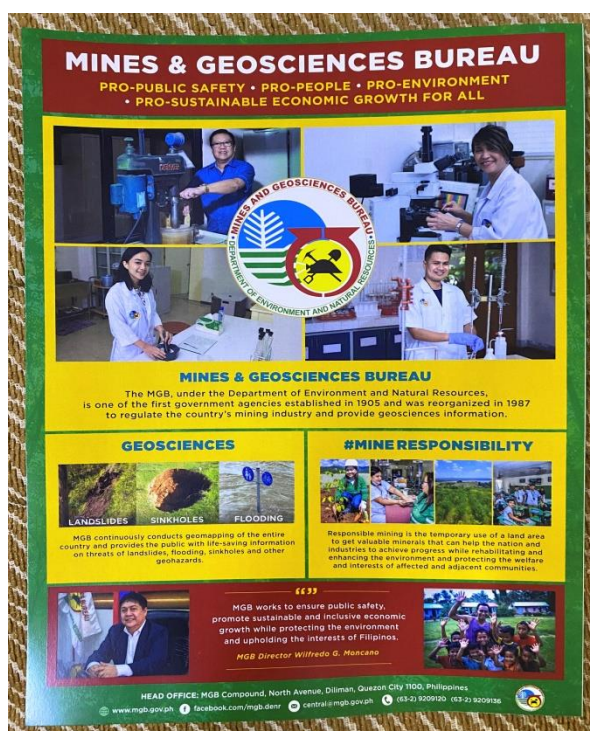
Some of the Cover Photos of Articles published on the Official MGB Regional Office No. XIII Website, mgbr13.ph, for CY 2021

## 2) IEC materials produced

Date published/posted	IEC Material

### 3) IEC materials reproduced/distributed

Date reproduced/distributed	IEC Material
January 2021	<i>#MineResponsibility</i> Campain Poster (56)
February 2021	<i>#MineResponsibility</i> Campain Flyer (59)
March 2021	<i>#MineResponsibility</i> Campain Poster (25)
May 2021	<i>#MineResponsibility</i> Campain Poster (60)
June 2021	<i>#MineResponsibility</i> Campain Poster (50)
August 2021	<i>#MineResponsibility</i> Campain Leaflet (50)
September 2021	<i>#MineResponsibility</i> Campain Poster (Ang Kagubatan na ito ay dating Minahan...) (60)
October 2021	<i>#MineResponsibility</i> Campain Leaflet (50) <i>#MineResponsibility</i> Campain Poster (Ang Kagubatan na ito ay dating Minahan...) (20)
November 2021	<i>#MineResponsibility</i> Campain Poster (Ang Kagubatan na ito ay dating Minahan...) (20)
December 2021	<i>#MineResponsibility</i> Campain Leaflet (50)



IEC materials reproduced and distributed by the MGB Regional Office No. XIII to various stakeholders in the academe and local government units

### 4) Statistics Reports submitted to MGB CO

Date submitted	Activity
January 2021	Regular submission of Reports
March 2021	Regular submission of Reports
April 2021	Regular submission of Reports
May 2021	Regular submission of Reports
July 2021	Regular submission of Reports
October 2021	Regular submission of Reports

## 5) Maps/Map Info Database submitted to MGB CO

Date submitted	Activity
January 2021	Regular submission of Monthly Reports
February 2021	Regular submission of Monthly Reports
March 2021	Regular submission of Monthly Reports
April 2021	Regular submission of Monthly Reports
May 2021	Regular submission of Monthly Reports
June 2021	Regular submission of Monthly Reports
July 2021	Regular submission of Monthly Reports
August 2021	Regular submission of Monthly Reports
September 2021	Regular submission of Monthly Reports
October 2021	Regular submission of Monthly Reports
November 2021	Regular submission of Monthly Reports
December 2021	Regular submission of Monthly Reports

## 6) MRGS Reports submitted to MGB CO

Date submitted	Activity
January 2021	Regular submission of Monthly Reports
February 2021	Regular submission of Monthly Reports
March 2021	Regular submission of Monthly Reports
April 2021	Regular submission of Monthly Reports
May 2021	Regular submission of Monthly Reports
June 2021	Regular submission of Monthly Reports
July 2021	Regular submission of Monthly Reports
August 2021	Regular submission of Monthly Reports
September 2021	Regular submission of Monthly Reports
October 2021	Regular submission of Monthly Reports
November 2021	Regular submission of Monthly Reports
December 2021	Regular submission of Monthly Reports

## National Linkages coordinated

Date of Activity	Title of Activity	Target Audience
January 22, 2021	Provision of a copy of partial and unreconciled matrices of the completed shipments of CMC, LMC, ANCDC, CPC-Parcel II and SPHYMC for CY 2020 to Governor Arlene J. Bag-ao of Province of Dinagat Islands	Provincial Government of Dinagat Islands
February 19, 2021	Provision of a copy of the partial filled-out template of the Regional Hard Indicators for Mining and Quarrying in Caraga for CYs 2018 to 2020 to Philippine Statistics Authority Caraga Regional Director Rosalinda C. Apura	Philippine Statistics Authority Caraga Regional Office
February 26, 2021	Mine Rehabilitation Fund Committee Meeting with Ms. Arceli T. Napalan, Executive Director of REACH Foundation, and Fr. Al Bonono, Environmental Desk Officer of the Diocese of Surigao, regarding Updates on Sinosteel Philippines H.Y. Mining	Civil society organization, religious sector and mining sector



	Corporation in Surigao City	
April 8, 2021	Mine Rehabilitation Fund Committee Meeting with Ms. Arceli T. Napalan, Executive Director of REACH Foundation, and Mr. Carlos C. Sodusta of CGC Ministers International Incorporated regarding Updates on CTP Construction and Mining Corporation in Surigao City	Civil society organization, religious sector and mining sector
May 14, 2021	Provision of Record of Shipments/Gross Output for the 1st Quarter of CY 2021 of mining companies operating within CADT-048 namely Taganito Mining Corporation, Surigao Integrated Resources Corporation/Platinum Group Metals Corporation, Adnama Mining Resources, Inc. and Greenstone Resources Corporation to National Commission on Indigenous Peoples-Surigao del Norte Provincial Officer, Atty. Victor Marc B. Bernal	National Commission on Indigenous Peoples-Surigao del Norte Provincial Office
June 25, 2021	Mine Rehabilitation Fund Committee Meeting with Ms. Arceli T. Napalan, Executive Director of REACH Foundation, and Fr. Al Bonono, Environmental Desk Officer of the Diocese of Surigao, regarding Updates on Sinosteel Philippines HY Mining Corporation in Surigao City	Civil society organization, religious sector and mining sector
July 16, 2021	Mine Rehabilitation Fund Committee Meeting with Ms. Arceli T. Napalan, Executive Director of REACH Foundation, and Fr. Al C. Bonono, Environmental Desk Officer of the Diocese of Surigao, regarding Updates on Hinatuan Mining Corporation in Surigao City	Civil society organization, religious sector and mining sector
August 25, 2021	Provision of data and information that will form part of the preparation of the 2 <sup>nd</sup> Quarter 2021 Caraga Regional Economic Situationer to National Economic and Development Authority Caraga Regional Director, Ms. Priscilla R. Sonido, CESO IV	National Economic and Development Authority Caraga Regional Office
September 3, 2021	Provision of information pertaining to the number of nickel ore shipments and corresponding Ore Transport Permits and Mineral Ore Export Permits of Marcventures Mining and Development Corporation (Mineral Production Sharing Agreement No. 016-93-X) from the start of commercial operation to present to Cantilan Municipal Mayor,	Municipal Local Government Unit of Cantilan, Surigao del Sur

	Maria Carla Lopez-Pichay	
October 20, 2021	Mine Rehabilitation Fund Committee Meeting with Atty. Jeffrey P. Galido, Municipal Administrator of Claver, regarding Updates on Adnama Mining Resources, Inc. via Zoom Platform	Municipal Local Government Unit and mining sector
November 5, 2021	Provision of comments and suggestions relative to Report on Caraga Asset Account for Non-Metallic Mineral Resources from 2015-2019 to Philippine Statistics Authority Caraga Regional Director Rosalinda C. Apura	Philippine Statistics Authority Caraga Regional Office
November 22, 2021	Mine Rehabilitation Fund Committee Meeting with Ms. Arceli T. Napalan, Executive Director of REACH Foundation, and Mr. Ricardo J. Dequiña from the Diocese of Butuan regarding Updates on Agata Mining Ventures, Inc.	Civil society organization, religious sector and mining sector

## OPERATION

### 003: ADAPTIVE CAPACITIES OF HUMAN COMMUNITIES & NATURAL SYSTEMS IMPROVED - PROGRAM 1: GEOLOGICAL RISK REDUCTION AND RESILIENCY PROGRAM

#### A.03.C Geological Assessment for Risk Reduction & Resiliency Program (Geosciences Development Services)

##### A.03.C.1 Land Geohazard Assessment

PERFORMANCE INDICATOR	TARGET	ACCOMPLISHMENT	%
<b>Field Mapping and Survey (1:10,000 scale)</b>			
LGUs - Cities/Municipalities (no.)			
1. Vulnerability and Risk Assessment (VRA)	5	5	100%
2. Updating of 1:10,000 scale Geohazards Maps (as a result of changes due to natural calamities)	5	5	100%
3. Karst Subsidence Hazard Mapping and Assessment	1	1	100%
Geohazard Reports Prepared (no.)	11	11	100%
Geohazard Maps Prepared (no.)	50	96	192%
4. Disaster – affected city/municipality assessed (no.)	1	1	100%
5. Environmentally Critical Areas assessed for geohazards (no.)	1	1	100%

## VULNERABILITY AND RISK ASSESSMENT

With the completion of the 1:10,000-scale geohazard mapping project, the Mines and Geosciences Bureau was tasked to continue its contribution to the Disaster Risk Reduction Management / Climate Change Adaptation initiatives of the National Government thru a new project, Vulnerability and Risk Assessment (VRA) which started in year 2015.

With the accomplished geohazard maps as key input, the VRA primarily aims to develop rain-induced landslide and flood risk information by evaluating existing conditions of vulnerability that could potentially harm exposed elements such as people, critical infrastructures and road networks. This could also be a useful tool for the LGUs in the conceptualization and implementation of efficient and strategic plans such as CLUP and Disaster Risk Reduction and Management Plans.

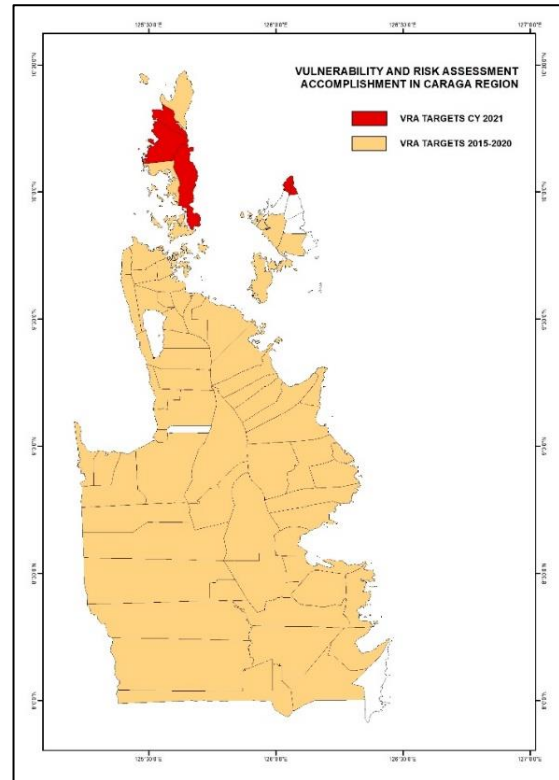


It also provides an opportunity to update the existing geohazard maps and validate those cities or municipalities in which the 10K geohazard mapping and assessment was undertaken thru outsource and thru MOA with mining companies. For this year, five (5) municipalities of Caraga Region were covered by the VRA program. These are:

1. Libjo, Province of Dinagat Islands
2. Tubajon, Province of Dinagat Islands
3. Cagdianao, Province of Dinagat Islands
4. Sta. Monica, Surigao del Norte
5. Burgos, Surigao del Norte

Updating of 1:10,000-scale landslide and flood susceptibility geohazard maps of the above mentioned 5 municipalities generated by MGB RO XIII was done during the VRA activity.

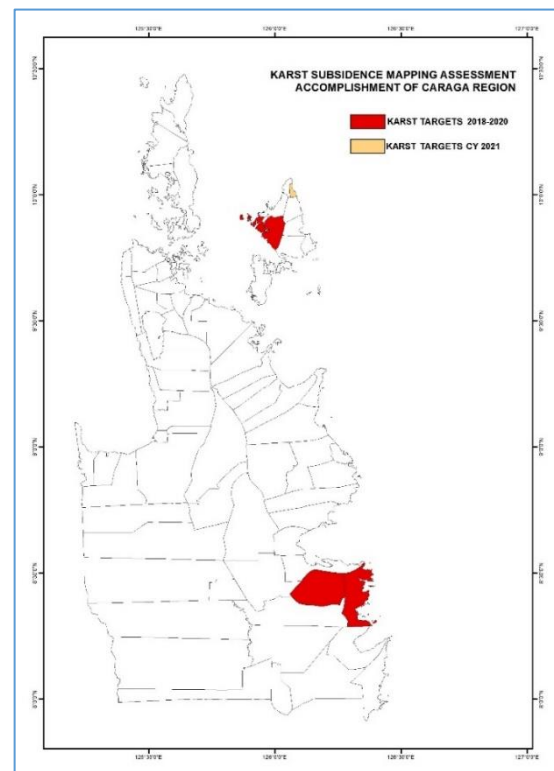
Photo documentation is attached in Annex GD A.



## GROUND SUBSIDENCE HAZARD ASSESSMENT

Ground subsidence in karst topography is one of the most dangerous geologic hazards that could happen due to its unpredictability. Therefore, there is a need to delineate and identify the susceptibility of the communities underlain with limestone to the said hazard. In CY 2021, ground (karst) subsidence assessment was conducted in the Municipality of Burgos, Province of Surigao del Norte which is predominantly underlain by limestone lithology.

Presence of sinkholes, cave openings and springs were mapped covering the six (6) barangays of Burgos Municipality. A total of 93 karst features were identified based on the actual fieldwork and GIS-generated sinks. Highlights of the survey are attached in Annex GD E.



## **10K UPDATING ON DISASTER AFFECTED CITY/MUNICIPALITY**

With the completion of the 1:10,000-scale geohazard mapping project, the updating of the 10K Geohazard Maps is a continuing project of the Mines and Geosciences Bureau. One way of updating the geohazard maps is conducting post hazard assessments to LGUs severely affected by rain-induced landslides and floods brought by intense climatological event. In 2021, the updating of the 10K geohazard maps in the Municipality of Rosario, Agusan del Sur was conducted which experienced extensive flooding brought by the passing of Tropical Depression Vicky on December 2020. Highlights of the survey are attached in Annex GD C.

## **ENVIRONMENTALLY CRITICAL AREAS ASSESSED FOR GEOHAZARDS**

One of the project of the Mines and Geosciences Bureau under the National Geohazard Mapping Program is to conduct geohazard mapping and assessment in Environmentally Critical Areas (ECA). The ECAs are areas that are sensitive to environmental impacts when certain projects or activities (e.g. tourism-oriented, developments, etc.) are conducted within it. The geohazard assessment conducted in the ECAs are salient inputs to the continuing updating of the 10K geohazard maps of the MGB. For CY 2021, the target municipality for the activity is the Municipality of Burgos, Surigao del Norte. Highlights of the survey are attached in Annex GD D.

The 192% accomplishment under the Geohazard Maps Prepared activity was because Performance indicator indicates that the 50 target is based only on minimum number of geohazard maps (5 VRA target x 3 hazard zones x 3 exposures = 45 + 5 updated maps). If however exposure is for both flood and landslide the 45 is doubled to 90 exposure maps.

## **CONDUCT OF INFORMATION, EDUCATION AND COMMUNICATION (IEC) CAMPAIGN OF VULNERABILITY AND RISK ASSESSMENT (VRA) TO LOCAL GOVERNMENT UNITS (LGUs)**

<b>PERFORMANCE INDICATOR</b>	<b>TARGET</b>	<b>ACCOMPLISHMENT</b>	<b>%</b>
<b>Conduct of IEC to LGUs (IEC Campaign on Geohazard and VRA Maps)</b>			
Seminars/Workshops for LGUs (Cities/Municipalities) conducted (no.)	5	6	120%
Lectures presented (no.)	4	7	175%
Advisories issued to municipality (no.)	5	6	120%

In connection with the conduct of the Vulnerability and Risk Assessment (VRA), Information Education and Communication (IEC) Campaign follows two years after the conduct of the assessment. In CY 2021, there are four (4) target but the actual accomplishment was six (6) municipalities namely:

	Province	Municipality/City	Date conducted
1	Surigao del Sur	Cortes	Sept. 28, 2021
2	Surigao del Sur	Cagwait	Sept. 30, 2021
3	Surigao del Sur	Carmen	Oct. 29, 2021
4	Surigao del Sur	Bayabas	Nov. 10, 2021
5	Surigao del Sur	Carrascal	Nov. 29, 2021
6	Surigao del Sur	Cantilan	Dec. 1, 2021

The IEC were all conducted virtually due to the COVID-19 pandemic wherein physical gatherings such as seminars and workshops were not yet possible.

The 175% accomplishment under the Lectures presented activity was due to the additional request from OCD for us to be resource speakers in their IEC to stakeholders.

Highlights of the conduct of the IEC are attached in Annex GD B.

#### **GEOHAZARD IEC MATERIALS DISSEMINATION**

PERFORMANCE INDICATOR	TARGET	ACCOMPLISHMENT	%
Maps disseminated (no.)	150	324	216%
Posters disseminated (no.)	500	546	109%
IEC disseminated in digital form (no.)	60	62	103%
Pamphlets/flyers disseminated (no.)	500	537	107%
Signages provided/installed (no.)	4	4	100%
Tri-Media (no.)	4	4	100%

The activity under Maps Disseminated registered a 216% accomplishments because target of 150 is the minimum [5 VRA-IEC Targets x 3 susceptibility levels (low, medium, high) x 3 elements at risk (communities, infrastructures and road networks x 3 copies (2 hard copies and 1 digital copy)]. However, if hazard is for both flood and landslide the maps disseminated will double and since we have one VRA-IEC additional accomplishment, maps will be  $6 \times 27 \times 2 = 324$ .

#### **CAPACITY BUILDING FOR GEOSCIENCES DIVISION PERSONNEL**

PERFORMANCE INDICATOR	TARGET	ACCOMPLISHMENT	%
Training/seminars conducted for/ attended by MGB technical personnel (no.)	8	10	125%

The 125% was due to the increase in Trainings/Seminars conducted by MGB Central Office to MGB RO's as mode is thru webinar which is easier to organize and at lesser cost.

As part of its continuing advocacy to capacitate technical personnel to further enhance their knowledge and skill in the performance of their tasks and/or promote their professional growth thru participation in seminars / conferences in their respective discipline, the following training programs were attended by staff of the division:

Title of Training Program		Organizer / Sponsor	Date of Program	Venue	Name of Attendees
1	2021 Virtual Geoscience Workshop	MGBCO	Feb 15-19, 2021	Via Microsoft Teams	All MGB13 Geologists
2	2021 Virtual Capacity Building on Advanced Exploration Training on	MGBCO	Feb 22-26, 2021	Via Microsoft Teams	Romeo M. Dalodado, Noel L. Lumague, & Beda Louie O. Cagmapang,
3	In-House Seminar on Application of Chemical Spot Tests on selected Ores and Mineral	MGBCO	June 18, 2021	Via Microsoft Teams	Cecilia L. Consuegra and Jusrit Elvie B. Seguis
4	Virtual Training on Paleontological Analysis	MGBCO	August 16-20, 2021	via Microsoft Teams	Mye Karla C. Semblante and Vernie A. Nonato
5	82 <sup>nd</sup> Virtual PIChe National Convention	Philippine Institute of Chemical Engineers	Sept. 15-17, 2021	Virtual Platform	Jusrit Elvie B. Seguis and Cecilia L. Consuegra
6	36 <sup>th</sup> Philippine Chemistry Congress	Chemical Society of the Philippines, Inc.	Sept. 20-24, 2021	Virtual Platform	Cecilia L. Consuegra
7	Training on Basic Mineragraphic Techniques	LGSD-MGB Central Office	Oct. 18-22, 2021	via Microsoft Teams	Noel G. Lumague and Mye Karla C. Semblante
8	Virtual Seminar-Workshop/Training on Coastal and Offshore Mineral Resources Exploration and Attendant Coastal Hazards Organized	Marine Geological Survey Division of MGBCO	November 8-12, 2021	via Microsoft Teams	Kate A. Boquilon, Claysterkim J. Paloma and Rubenar A. Cagubcob
9	Regional Geoscience Congress of South East Asia (GEOSEA 2021)	MGBCO	December 6-8, 2021	via Microsoft Teams	All MGB13 Geologists
10	Training Workshop on Applied Hydrogeology	MGBCO	December 15-18, 2021	via Microsoft Teams	Kate A. Boquilon, Claysterkim J. Paloma and Rubenar A. Cagubcob

## GEOHAZARD OPERATION CENTER

The Geohazard Operation center was operationalized during the passage of Tropical Depression “Auring” on February 2021, Tropical depression “Jolina” on September 2021 and the recent typhoon “Odette”. Advisories were issued to the PLGUs and MLGUs, encouraged to check/review the disseminated 1:10,000 scale for the rain-induced landslide and flooding geohazard maps and executive summary report/threat advisory letter that were duly served to each municipality/barangay to be used as a tool to adopt necessary precautionary and preparedness measures especially for those municipalities, barangays or specific sitio/purok having been identified by the Office as having a very high to moderate landslide and flood risk rating. List of susceptible barangays to flooding and/or landslide were also presented to the PDRA Analyst and/or core group meetings called for by OCD Region XIII.

The Operation Center was activated thru monitoring of situations of flooding and landslide in different areas of the region which were provided to the Geohazard Operation Center of MGB Central Office for consolidation.

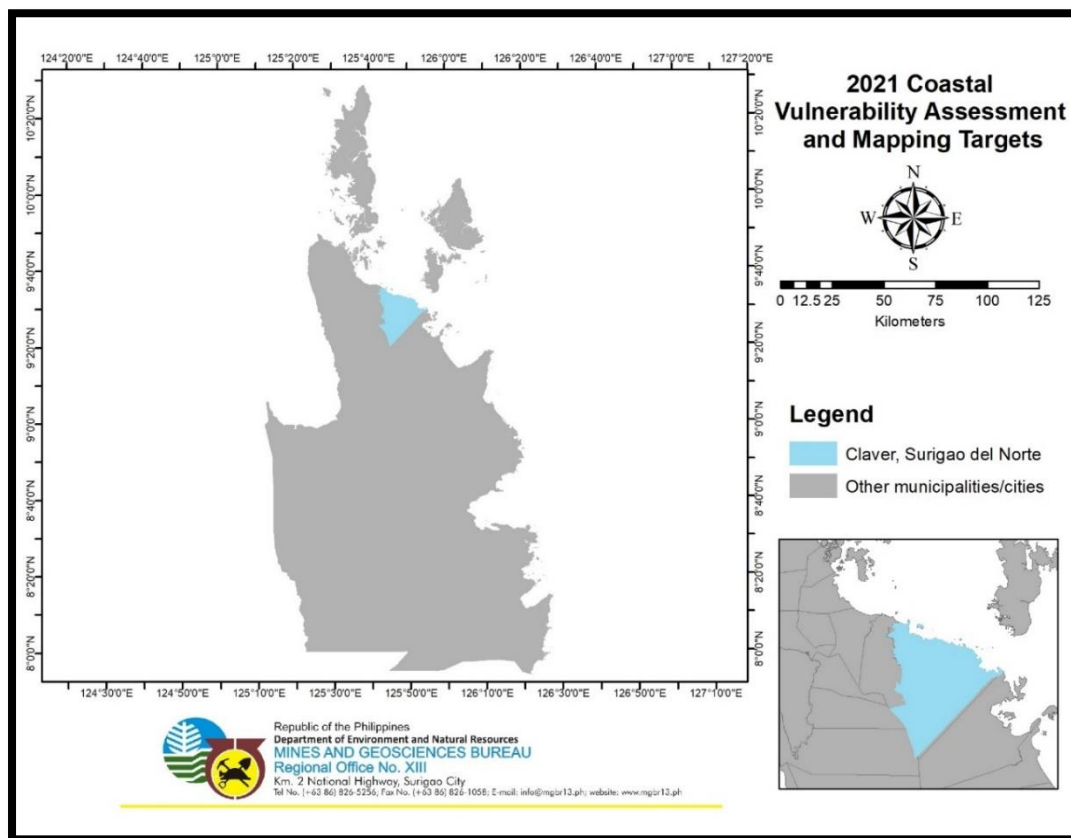
PERFORMANCE INDICATOR	TARGET	ACCOMPLISHMENT	%
a) Geohazards Operation Center Maintained (no.)	1	1	100%
b) Advisories re issued (no.)	73	126	173%
c) Participation in PDRA (no.)	1	4	400%

There were additional advisories to LGU needs to be disseminated because of typhoon Odette, hence the 173% accomplishments. While the 400% was because more weather disturbance affected the Region and more PDRA was conducted by OCD – RDRRMC.

## COASTAL VULNERABILITY ASSESSMENT AND MAPPING

The coastal areas along the Municipality of Claver, Surigao del Norte as well as the third field visit on the coastal of Bacuag and Gigaquit are the target areas of DENR-MGB Regional Office No. XIII of this mapping project for CY 2021. Ideally, the assessment would be conducted thrice a year spreading the visits in the dry, wet and transition periods to have a better picture of the vulnerabilities of the target areas. The first visit was last May 2021 and the second visit was scheduled on November 2021.

PERFORMANCE INDICATOR	TARGET	ACCOMPLISHMENT	%
<b>Monitoring of Coastal Municipalities/Cities on accretion and erosion</b>			
Coastal Municipal LGUs (Cities/Municipalities monitored (no.))	3	3	100%
Reports with maps prepared (no.)	1	1	100%



### 2021 Coastal Vulnerability Assessment and Mapping Target in Region 13

To fulfill the objective, seven (7) physical parameters were considered in determining the Coastal Vulnerability Index (CVI) namely: a) shoreline changes for the past 14 years; (b) classification of geomorphic units and substrate type; (c) coastal slope (in degrees); (d) presence/absence of natural buffers (mangroves, seagrass, and/or coral reefs); (e) presence of hard engineering defenses (e.g. groins, seawall, breakwaters, dikes); (f) mean tidal range and (g) coastline orientation with respect to the dominant wind-driven wave direction.

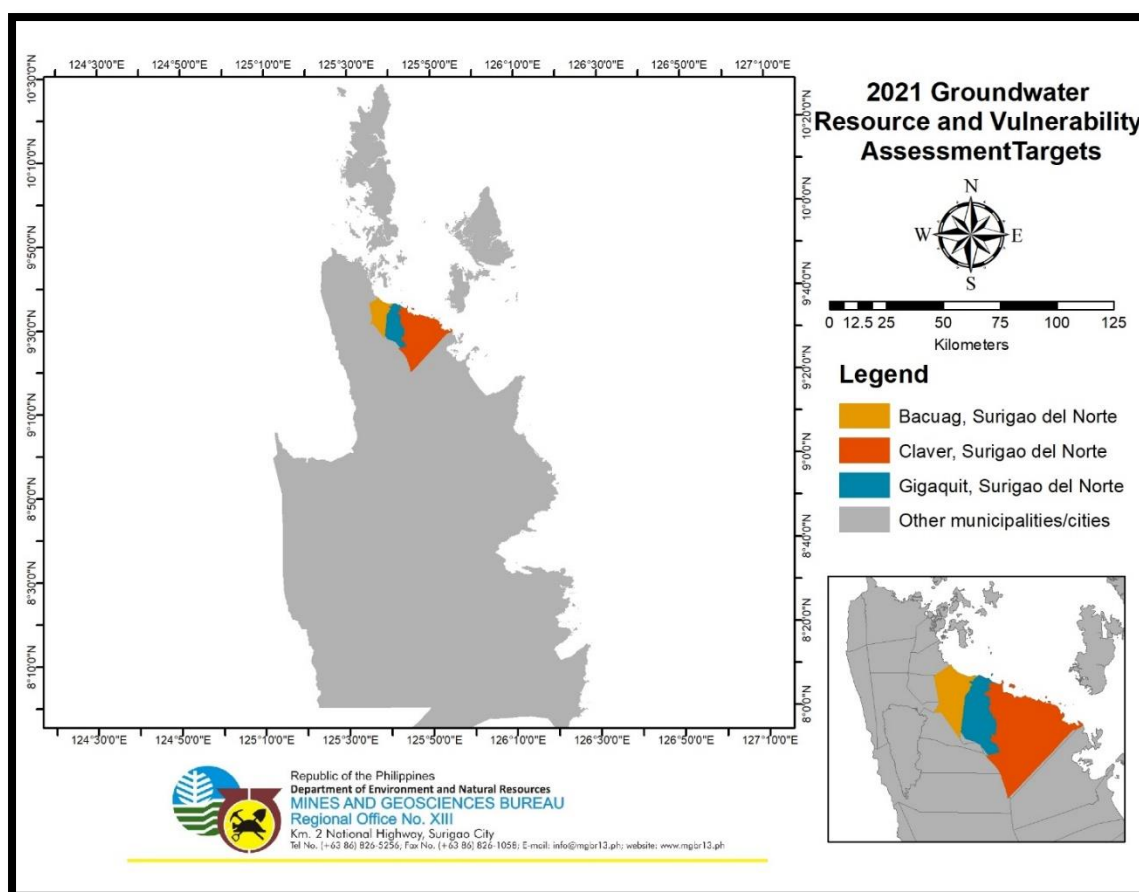
Photo documentation of the coastal vulnerability assessment and mapping activities are attached in Annex GD F.



## GROUNDWATER RESOURCE ASSESSMENT

Three (3) municipalities of Region 13 are the targets of the Groundwater Resource and Vulnerability Assessment program for the year 2021. The targets are based on the municipalities/cities within Magallanes Basin Watershed which is the target for the watershed vulnerability assessment. These municipalities are Bacuag, Gigaquit and Claver, Surigao del Norte.

PERFORMANCE INDICATOR	TARGET	ACCOMPLISHMENT	%
<b>Groundwater Resource and Vulnerability Assessment</b>			
LGUs assessed - Cities/Municipalities (no.)	3	3	100%
Groundwater Assessment Reports with Maps prepared (no.)	4	4	100%



2021 Groundwater Resource and Vulnerability Assessment Targets in Region 13

Municipalities	Well Inventory	No. of VES Lines	Water Sampling (Vusitu/HANNA)
Tago	76	2	67
San Miguel	29	0	24

Bayabas	4	0	4
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The Groundwater Resource and Vulnerability Assessment includes the following activities: Water sampling and quality tests, measurement of static water level of pump wells using water level meter and Georesistivity Survey.

General information like geology and geomorphology of the area is noted. For the well inventory, the well usage, well type, drilling method, pump type, and the rock type data is taken during the survey. The coordinates of the sources or wells on the barangay is taken using the GPS. Water sampling for water quality test was done simultaneously with well inventory activity. In situ sampling and analysis were conducted using the portable water quality kit/s (smarTROLL and HANNA Multi-parameter Handheld water test device). Physical parameter measured on site includes temperature, pH, Total Dissolve Solid (TDS), conductivity, ORP (Oxidation Reduction Potential) and salinity. The water level from ground surface of a well was measured using ALFA WL 100 type-2B instrument.

Table 1. Number of Well Inventory, VES lines and Water Samples per Municipality

Municipalities	Well Inventory	No. of VES Lines	Water Sampling (smarTROLL/HANNA)
Bacuag	14	2	11
Gigaquit	32	2	29
Claver	45	2	42

The table above shows the inventory conducted in 3 municipalities. A total of 91 wells were mapped. Six (6) VES (vertical electrical sounding) lines were surveyed using the Georesistivity equipment. There are a total of 82 water samples analyzed in situ.

Photos of the groundwater resource and vulnerability assessment activities are attached in Annex GD G.

## MISCELLANEOUS GEOLOGICAL SERVICES

PERFORMANCE INDICATOR	TARGET	ACCOMPLISHMENT	%
<b>Technical Assistance Provided (GIR/GVR/EGGAR/SLF)</b>			
Investigation/Inspection Reports prepared (no.)	17	43	253%
Certifications issued (no.)	250	899	360%

A total of forty-three (43) geological services were provided to various clienteles. This could be further categorized based on purpose as follows:

### ➤ **Geohazard Identification Survey**

As one of the mandatory requirement for securing an Environmental Clearance Certificate for housing projects and, optionally, other land development projects as deemed applicable by the Environmental Management Bureau (EMB), Geohazard Identification Survey (GIS) was conducted on the following proposed site:

	<b>Name of Project</b>	<b>Proponent</b>	<b>Location</b>
1	West Highlands Phase 2-B Housing Project	Mr. Allan V. Eguilos	Bonbon, Butuan City, Agusan del Norte
2	Sunlife Homes Subd.	Ms. Bernadette F. Ligalig	Brgy. Poctoy, Surigao City, SDN
3	NHA – Patricio Tribal Village	LGU – Sta. Josefa, ADS	Brgy. Patrocinio, Sta. Josefa, ADS
4	Marrea Dreamhouse	Mr. Marlou Angelo Hinay	Brgy. Sta. Irene, Bayugan City, ADS
5	Marrea Highlands	Mr. Marlou Angelo Hinay	Brgy. Karaos, San Francisco, ADS
6	Marrea Happyville	Mr. Marlou Angelo Hinay	Brgy. Sta. Irene, Bayugan City, ADS
7	Indigenous People Village	LGU – Trento, ADS	Sitio Gasa, P-11, Pob., Trento, ads
8	Trento Resettlement Project III	LGU – Trento, ADS	Sitio Lilo, P-22, Pob, Trento, ADS
9	Famusa View Heights Subd.	Ms. Rose Lynde C. Salalima	Brgy. Poblacion, Trento, ADS
10	St. Francis of Assisi Multi-purpose Coop(SFAMPC)	Mr. Jose F. Otaza	P-8, Poblacion, Trento, Agusan del Sur
11	Yolanda Permanent Housing Project	NHA – Surigao/Dinagat Islands	Sitio Cambinliw, Brgy. Santiago, Loreto, PDI
12	VCDU Subd. Project	Mr. Victor S. Uy	P-11A, Brgy. Ambago, Butuan City
13	VCDU Subd. Project	Mr. Victor S. Uy	Brgy. Sacol, Buenavista, ADN
14	Bayugan Public Cemetery	LGU – Bayugan City, Agusan del Sur	P-11, Brgy. Salvacion, Bayugan City, ADS
15	Tubod Housing Project	LGU – Tubod, SDN	P-Sampaguita, Brgy. San Pablo, Tubod, SDN
16	Golden Horizon HOAI Housing Project	Mr. Carlito T. Givero	P-13 Isdaon, Poblacion, Trento, ADS
17	Purok Cassava HOAI Housing Project	Mr. Severo M. Sagales	P-Cassava, Brgy. Maon, Butuan City, ADN
18	PAMO Site, Tinuy-an Falls Protected Landscape(TFPL)	DENR -XIII	Sitio Mabog, Brgy. San Roque, Bislig City, SDS; Sitio Mabog, Brgy. Imelda, Bunawan, ADS
19	San Isidro JOSAFAT Village	LGU – San Isidro, SDN	Brgy. Del Carmen, San Isidro, SDN
20	VCDU Subd. Project	Mr. Victor S. Uy	P-8, Sitio Malalag, Brgy. Libertad, Butuan City, ADN
21	Samaritan Village Housing Project	LGU – Prosperidad, ADS	P-28, Brgy. Poblacion, Prosperidad, ADS
22	Marrea Dreamhouse	Mr. Marlou Angelo Hinay	P-6, Brgy. Bayugan 2, San Francisco, ADS
23	Apple Homes Subd. Project	Mr. Jaskaran Singh Sidhu	Brgy. Calibunan, Cabadbaran City, ADN
24	VCDU-Pines Mansion 3 Subd. Project	Mr. Victor S. Uy	Brgy. Imadejas, Butuan City, ADN

25	VCDU – Prince Town Homes Project	Mr. Victor S. Uy	P-1, Brgy. Abilan, Buenavista, ADN
26	Ang Bag-ong San Benito Village	LGU – San benito, SDN	p-3, Talisay, San Benito, SDS
27	Gypsy Realty Development Project	Mr. Prince Sam B. Platil	Brgy. Poblacion 3, San Francisco, ADS

➤ **Solid Waste Disposal Site Suitability Assessment**

As part of its technical support to the Environmental Management Bureau in evaluating the geological site suitability of proposed solid waste disposal sites prior to issuance of Notice to Proceed (NTP), Six (6) proposed sanitary landfill (SLF) / ecological solid waste management park (Eco-SWM Park) projects were assessed by the Office namely:

	<b>Name of Project</b>	<b>Proponent</b>	<b>Location</b>
1	Sanitary Landfill Facility	LGU – Talacogon, Agusan del Sur	Sitio Consuelo, Brgy. Labnig, Talacogon Agusan del Sur
2	Sanitary Landfill Facility	LGU – Veruela, Agusan del Sur	Sitio Tugpan, Brgy. Sinobong, Veruela, Agusan del Sur
3	Sanitary Landfill Facility	LGU – San Agsutin, Surigao del Sur	Purok 1 Sitio Awog, Brgy. Buatong, San Agustin, Surigao del Sur
4	Sanitary Landfill Facility	LGU-Mainit, Surigao del Norte	Brgy. San Isidro, Mainit, Surigao del Norte
5	Sanitary Landfill Facility	LGU-Tandag City, Surigao del Sur	Brgy. San Isidro, Tandag City, Surigao del Sur
6	Sanitary Landfill Facility	LGU-San Miguel, Surigao del Sur	Purok 1, Brgy. Umalag, San Miguel, Surigao del Sur

➤ **Geohazard Assessment**

Nine (9) reports were generated to assess the damage and consequent risks posed. These reports are as follows:

1. Spot Report on the Landslide at Purok 2, Sitio Cayutan, Brgy. Cagniog, Surigao City
2. Geohazard Assessment of the reported tension cracks at Punta Naga Mamanwa Village in Brgy. Cagdianao, Claver, Surigao del Norte
3. Geohazard Assessment Report of the Commercial Sand and Gravel Application of Mr. Guillermo M. Autor located in Brgy. Doña Helen, Dinagat Islands

4. Geohazard Assessment Report of the Commercial Sand and Gravel Application of Mr. Marvin M. Lasco located in Brgy. Diaz, Tubajon, Dinagat Islands
5. Preliminary Report on the Cave Geohazard Assessment conducted at the Vin4 Bluewaters Resort in Brgy. Vinapor, Carmen, Agusan del Norte
6. Geohazard Review of the Geohazard Assessment Report of the Valencia Nickel Townsite Project located in Brgy. Valencia, Cagdianao, Dinagat Islands
7. Geohazard Assessment at Purok 3 (Tagubon) Portion of Taguibo River in Brgy. Anticala, Butuan City, Agusan del Norte
8. Initial Incident Report on the effects of Typhoon Odette (Rai) in Region XIII (Caraga) and Situational Report No. 01&02
9. Initial Incident Report on the effects of Typhoon Odette (Rai) in Dinagat Islands, Region XIII (Caraga)

## **GEOHAZARD CERTIFICATIONS**

A total of eight hundred ninety-nine (899) geohazard certifications were issued upon the request of Provincial / Local Government Units, National Line Agencies and schools for their proposed projects school buildings and eco-tourism sites. Geohazard certifications for proposed relocation/resettlement sites were also catered for budgetary purposes only since areas greater than one (1) hectare or if it has no Certificate of Non-Coverage for ECC from Environmental Management Bureau is still subject for Geohazard Identification Survey.