



DENR MIMAROPA RECORDS SECTION  
**RECEIVED**  
20 MAY 2022  
INFORMING ☐ OUTGOING ☐  
DATE NO.

May 25, 2022

**MEMORANDUM**

**FOR :** The Regional Executive Director  
MIMAROPA Region

**THRU :** The ARD for Technical Services

**FROM :** PENRO  
Oriental Mindoro

**SUBJECT :** **SUBMISSION OF MONTHLY REPORT ON DATA  
GENERATED FROM THE SCIENCE-BASED REAL-TIME  
WATERSHED MONITORING INSTRUMENTS DATED APRIL  
25- MAY 17, 2022**

Submitted is the report to the office of the Regional Executive Director regarding the above captioned subject.

Forwarding is the monitored and analyzed data generated from the Automated Weather Stations (AWS), Automated Water Level Station (AWLS) and Conductivity Temperature and Depth (CTD) groundwater sensor established in the Province of Oriental Mindoro.

The cover of the analysis is from April 25, 2022 to May 17, 2022, because some of the instruments from Automated Weather Station are being dismantled for calibration and maintenance as per request.

For information and record.

*For the PENR Officer:*

  
**ALMA E. GIBE**

DMO V/Chief, Technical Services Division  
In-Charge, Office of the PENRO



DENRPFNR02205000051



May 25, 2022

**MEMORANDUM**

**TO :** The PENR Officer  
Oriental Mindoro

**TRHU :** The Chief, Technical Services Division


**FROM :** CDS Personnel

**SUBJECT :** **SUBMISSION OF MONTHLY REPORT ON DATA  
GENERATED FROM THE SCIENCE-BASED REAL-TIME  
WATERSHED MONITORING INSTRUMENTS DATED APRIL  
25 – MAY 17, 2022**

Submitting the monthly monitored and analyzed data generated from the Automated Weather Stations (AWS), Automated Water Level Station (AWLS) and Conductivity Temperature and Depth (CTD) groundwater sensor established in the Province of Oriental Mindoro.

As per memorandum, using the prescribe reporting format for the report from the Office of Forest Management Bureau to have a uniform reporting and in order to effectively and efficiently monitor and assess the data being generated from the installed instrumentation for watershed.

For information and record.

  
**ALISTER EARL M. MEMAN**  
DMITS-CDS



**MONTHLY REPORT ON DATA GENERATED FROM THE SCIENCE-BASED REAL-TIME  
WATERSHED MONITORING INSTRUMENTS  
APRIL 25- MAY 17, 2022**

Relative to the continuity of monitoring of data referring to the FMB Technical Bulletin No. 17 of Department of Environment and Natural Resources of Oriental Mindoro "Adaptation of the Setting –up of Instrumentation in watersheds" ensuring monitoring that requires constant collection of accurate and data using standard techniques and instruments to generate real time data and information relevant to the characterization of the watershed management in Oriental Mindoro.

Below are sets of table showing the status of all installed instruments within the primary area of monitored watershed in the Province of Oriental Mindoro

**Monitoring Instruments Installed within the Watershed of Oriental Mindoro  
Status Condition as of April 25-May 17, 2022**

<b>Monitoring Instruments Installed, Oriental Mindoro</b>				
<b>Instrument</b>	<b>Purpose</b>	<b>Location (Coordinates,Brgy, Town/City</b>	<b>Date Installed</b>	<b>Status</b>
Automated Water Level Station (AWLS)	This is a solar –powered setup device composed of Advanced remote Data Acquisition Unit with a non-volatile memory capable of storing approximately one year of data, two independent high-capacity rechargeable lithium polymer batteries as backup power supply, GSM module capable of sending data in a configurable time interval and a water level sensor.  The device monitors and transfers in a real-time the water level data of Mag-asawangTubig Watershed in Oriental Mindoro.	Abaton-Madlang Bridge, Parang, Victoria, Calapan City Oriental Mindoro	January 2019	The instrument installed is still in its best and good condition
Ground Water Monitoring Station	This is a solar-powered setup device composed of an Advanced remote Data Acquisition Unit with a non-volatile memory capable of storing approximately one year of data, two independent high-capacity rechargeable lithium polymer batteries as backup power supply, GSM module capable of sending data in a configurable time interval and a ground water sensor.  The device monitors and transfer in real-time the ground level data of Mag-asawangTubig Watershed in Oriental Mindoro	Coordinates (lat 13.1534587, long 121.1857318)  Barangay Alcate, Victoria, oriental Mindoro (MinSCAT Compound)	May 22, 2019	As of the present it is not active  The instrument was un-mounted for troubleshooting purposes

Automated Weather Station (AWS)	<p>This is a solar-powered setup device composed of an Advanced remote Data Acquisition Unit with a non-volatile memory capable of storing approximately one year of data, two independent high-capacity rechargeable lithium polymer batteries as backup power supply, GSM module capable of sending data in a configurable time interval and a microclimate sensor.</p> <p>The device monitors the air temperature and humidity and measures rain volume and wind velocity, rain intensity, and air pressure found in the interface between the body and support surface of Mag-asawangTubig Watershed in Oriental Mindoro.</p>	<p>Coordinates (lat 13.1963574, long 121.2452057) Macatoc Elementary School,</p>	May 22, 2019	Though the instruments are in good condition, the whole set of the instruments installed are temporary dismantled for calibration maintenance and troubleshooting.
Automated Weather Station (AWS)	<p>This is a solar-powered setup device composed of an Advanced remote Data Acquisition Unit with a non-volatile memory capable of storing approximately one year of data, two independent high-capacity rechargeable lithium polymer batteries as backup power supply, GSM module capable of sending data in a configurable time interval and a microclimate sensor.</p> <p>The device monitors the air temperature and humidity and measures rain volume and wind velocity, rain intensity, and air pressure found in the interface between the body and support surface of Mag-asawangTubig Watershed in Oriental Mindoro.</p>	<p>Coordinates (lat 13.1161873, long 121.1842457)  Barangay Alcate, Victoria, Oriental Mindoro (DA Compound)</p>	May 22, 2019	Though the instruments are in good condition, the whole set of the instruments installed are temporary dismantled for calibration maintenance and troubleshooting.
Automated Weather Station (AWS)	<p>This is a solar-powered setup device composed of an Advanced remote Data Acquisition Unit with a non-volatile memory capable of storing approximately one year of data, two independent high-capacity rechargeable lithium polymer batteries as backup power supply, GSM module capable of sending data in a configurable time interval and a microclimate sensor.</p> <p>The device monitors the air temperature and humidity and measures rain volume and wind velocity, rain intensity, and air pressure found in the interface between the body and support surface of Bongabong Watershed in Oriental Mindoro.</p>	<p>Coordinates (lat 12.6980905, long 121.3720355)  DENR CENRO Roxas Barangay Hagan, Bongabong, Oriental Mindoro (Ranger Station)</p>	May 21, 2019	Though the instruments are in good condition, the whole set of the instruments installed are temporary dismantled for calibration maintenance and troubleshooting.



### Locator Map of Watershed Installed within the Province of Oriental Mindoro



*GPS location of Instrumentation installed within the jurisdiction of Province of Oriental Mindoro (Fig 1.)*

*The figure above is showing the location area of installed watershed instrumentation within the provincial jurisdiction of Province of Oriental Mindoro. There are different types of Instrumentation installed in this area this are; the Automated Weather Station, the Automated Water Level Station, the Ground Water Monitoring Station.*



## DATA ANALYSIS

### Summary of the data collected for the period of April 25, 2022 – May 17, 2022

#### Automated Weather Station (AWS), DA Victoria

Parameter	Number of Instruments Installed	Period Covered	Average (mm/h Max Precipitation Rate)	Maximum	Minimum
Rainfall	1	04/25/22-05/17/22	1.48	156	0
Air Temperature	1	04/25/22-05/17/22	27.23	33.8	21
Relative Humidity	1	04/25/22-05/17/22	86.65	99.2	54.8
Wind Velocity	1	04/25/22-05/17/22	0	0	0
Wind Direction	1	04/25/22-05/17/22	0	0	0
Solar Radiation	1	04/25/22-05/17/22	201.20	1013.3	0
Streamflow Level (m)	0	no data available (*)	no data available (*)	no data available (*)	no data available (*)
Streamflow Temp (c)	0	no data available (*)	no data available (*)	no data available (*)	no data available (*)
Groundwater Level (m)	2	no data available – Subscription is not renewed due to data logger device is for repair	no data available – Subscription is not renewed due to data logger device is for repair	no data available – Subscription is not renewed due to data logger device is for repair	no data available – Subscription is not renewed due to data logger device is for repair
Soil Moisture	2	04/25/22-05/17/22	10cm = 39.87 30cm = 61.05	46.7 80.3	-41 26.1
Conductivity	2	no data available – Subscription is not renewed due to data logger device is for repair	no data available – Subscription is not renewed due to data logger device is for repair	no data available – Subscription is not renewed due to data logger device is for repair	no data available – Subscription is not renewed due to data logger device is for repair

NOTE: Average values are computed arithmetic average for all instruments installed in the watershed (e.g., average of rainfall from all AWS installed in the watershed). Maximum and minimum values are the maximum and minimum values observed in the watershed from all instruments.

\*Data is being requested at National Irrigation Administrator for Streamflow Level (m) and Streamflow Temp (c).

#### Automated Weather Station (AWS), Macatoc Elementary School

Parameter	Number of Instruments Installed	Period Covered	Average (mm/h Max Precipitation Rate)	Maximum	Minimum
Rainfall	1	04/25/22-05/17/22	1.33	132	0
Air Temperature	1	04/25/22-05/17/22	28.58	35	22.8
Relative Humidity	1	04/25/22-05/17/22	82.84	105.7	51.5
Wind Velocity	1	04/25/22-05/17/22	0.18	1.9	0
Wind Direction	1	04/25/22-05/17/22	47.94	359	0
Solar Radiation	1	04/25/22-05/17/22	224.87	1050.5	0
Streamflow Level (m)	0	no data available (*)	no data available (*)	no data available (*)	no data available (*)
Streamflow Temp (c)	0	no data available (*)	no data available (*)	no data available (*)	no data available (*)
Groundwater Level (m)	2	no data available – Subscription is not renewed due to data logger device is for repair	no data available – Subscription is not renewed due to data logger device is for repair	no data available – Subscription is not renewed due to data logger device is for repair	no data available – Subscription is not renewed due to data logger device is for repair
Soil Moisture	2	04/25/22-05/17/22	10cm = 11.80 30cm = no data recorded from the data logger	17.9 No data recorded from the data logger	-2.3 No data recorded from the data logger
Conductivity	2	no data available – Subscription is not renewed due to data logger device is for repair	no data available – Subscription is not renewed due to data logger device is for repair	no data available – Subscription is not renewed due to data logger device is for repair	no data available – Subscription is not renewed due to data logger device is for repair

NOTE: Average values are computed arithmetic average for all instruments installed in the watershed (e.g., average of rainfall from all AWS installed in the watershed). Maximum and minimum values are the maximum and minimum values observed in the watershed from all instruments.

\*Data is being requested at National Irrigation Administrator for Streamflow Level (m) and Streamflow Temp (c).



*Automated Weather Station (AWS), Municipality of Bangobong*

Parameter	Number of Instruments Installed	Period Covered	Average	Maximum	Minimum
Rainfall	1	04/25/22-05/17/22	No data recorded from the data logger	No data recorded from the data logger	No data recorded from the data logger
Air Temperature	1	04/25/22-05/17/22	No data recorded from the data logger	No data recorded from the data logger	No data recorded from the data logger
Relative Humidity	1	04/25/22-05/17/22	No data recorded from the data logger	No data recorded from the data logger	No data recorded from the data logger
Wind Velocity	1	04/25/22-05/17/22	No data recorded from the data logger	No data recorded from the data logger	No data recorded from the data logger
Wind Direction	1	04/25/22-05/17/22	No data recorded from the data logger	No data recorded from the data logger	No data recorded from the data logger
Solar Radiation	1	04/25/22-05/17/22	No data recorded from the data logger	No data recorded from the data logger	No data recorded from the data logger
Streamflow Level (m)	0	no data available (*)	no data available (*)	no data available (*)	no data available (*)
Streamflow Temp (c)	0	no data available (*)	no data available (*)	no data available (*)	no data available (*)
Groundwater Level (m)	2	no data available – Subscription is not renewed due to data logger device is for repair	no data available – Subscription is not renewed due to data logger device is for repair	no data available – Subscription is not renewed due to data logger device is for repair	no data available – Subscription is not renewed due to data logger device is for repair
Soil Moisture	2	04/25/22-05/17/22	No data recorded from the data logger	No data recorded from the data logger	No data recorded from the data logger
Conductivity	2	no data available – Subscription is not renewed due to data logger device is for repair	no data available – Subscription is not renewed due to data logger device is for repair	no data available – Subscription is not renewed due to data logger device is for repair	no data available – Subscription is not renewed due to data logger device is for repair

NOTE: Average values are computed arithmetic average for all instruments installed in the watershed (e.g., average of rainfall from all AWS installed in the watershed). Maximum and minimum values are the maximum and minimum values observed in the watershed from all instruments.

\*Data is being requested at National Irrigation Administrator for Streamflow Level (m) and Streamflow Temp (c).

*Ground Water Monitoring Station(GWMS), MinSU, Victoria*

Parameter	Number of Instruments Installed	Period Covered	Average	Maximum	Minimum
Rainfall	0	no data available	no data available	no data available	no data available
Air Temperature	0	no data available	no data available	no data available	no data available
Relative Humidity	0	no data available	no data available	no data available	no data available
Wind Velocity	0	no data available	no data available	no data available	no data available
Wind Direction	0	no data available	no data available	no data available	no data available
Solar Radiation	0	no data available	no data available	no data available	no data available
Streamflow Level (m)	0	no data available	no data available	no data available	no data available
Streamflow Temp (c)	0	no data available	no data available	no data available	no data available
Groundwater Level (m)	2	no data available	no data available	no data available	no data available
Soil Moisture	0	no data available	no data available	no data available	no data available
Conductivity	2	no data available	no data available	no data available	no data available

NOTE: Average values are computed arithmetic average for all instruments installed in the watershed (e.g., average of rainfall from all AWS installed in the watershed). Maximum and minimum values are the maximum and minimum values observed in the watershed from all instruments.

Base on the above table there are data that are unavailable due to some reasons, it was reported before that the Ground Water Monitoring Station (GMWS) in MinSU, Victoria Oriental Mindoro is in need of repair and data logger device needs a replacement and calibration to the instruments for continuity of data needed for future analysis regarding the needed parameters on the analysis.

A daily monitoring is done using the ZENTRA CLOUD system as the main platforms to have access on the transmitted data from the data logger installed within the different station along the provincial jurisdiction area of Oriental Mindoro. The system can provide a data in daily, weekly and monthly basis, data provided came from this mainstream digital site.

On May 4, 2022, I was informed by Sir Ron from the Regional Office to participate on the 'Regional Presentation of the Annual Report (January to December 2021) on Data Visualization and Analysis generated by the Watershed Monitoring Instruments' to observed and familiarized on the procedures regarding the analysis and presentation of figures gathered from upper stream to lower stream where instrumentations installed. It gives me more knowledge on the program.

An order was forwarded to me that AWS instruments must be calibrated to provide a data that will be precise and real-base for future analysis.

On May 17-18, 2022, we travel to Victoria, Bongabong Oriental Mindoro to retrieve all the instruments and do maintenance by cleaning the devices and pack it for transport to Manila.

I was not able to make a comparison of data from different affiliated agencies because as of now no data was provided by them. It was agreed on the agreement that this affiliated agencies will support the program base on the Department of Environment and Natural Resources FMB Technical Bulletin No. 17 regarding "Adaptation on the Setting-Up of Instrumentations on watersheds on the Province of Oriental Mindoro", where in the purposed of the data gathered is to do comparison of data recorded from similar instruments installed in their respective area of jurisdiction.

To address the problem, a letter of follow up will be sent to the following agency regarding the data needed for comparison; PAGASA, DOST and CDRRMD as soon as possible.



## Recommendations

It is a must to calibrate and repair all damages instruments installed for the watershed for continuity of the program because the importance of this instruments are vital to the community, it will allow them to be prepared and be environmental awareness and use all the provided information from the analyze data from the instrumentation to make them more adoptable to the changeable climatic occurrence in the surrounding and environment.

Since all Automated Weather Station (AWS) instruments are being dismantled and sent to Manila for calibration purposes, there will be a temporary stop in monitoring of data until the calibration will be done.

Also, the need for replacement of the data logger device installed in MinSU is necessary for the continuity of the program.

The data requested from other affiliated agency are not yet forwarded thru e-mail the in-depth analysis of the data will be pending and also the calibration of DOST-PAGASA team should be done to pursue with the analysis.

Prepared by:



Alister Earl M. Meman  
Database Manager IT Specialist



During the dismantle of installed instruments from different stations (May 17-18, 2022)

