



Republic of the Philippines  
Department of Environment and Natural Resources  
**PROVINCIAL ENVIRONMENT AND NATURAL RESOURCES OFFICE**  
MIMAROPA Region

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**MEMORANDUM**

**FOR :** The Regional Executive Director  
DENR MIMAROPA Region  
1515 DENR By the Bay Building, Roxas Boulevard,  
Barangay 668, Ermita, Manila

**THRU :** The ARD for Technical Services

**FROM :** The OIC, PENR Officer

**SUBJECT :** SUBMISSION OF ANNUAL REPORT FOR THE WATER  
QUALITY MONITORING OF APO REEF NATURAL PARK  
FOR CY 2023 [P-2023-00011138]

Forwarded is the memorandum dated November 21, 2023, of CENRO Sablayan regarding the submission of Annual Report for Water Quality of Apo Reef Natural Park – Protected Area Management Office.

Attached with the report are the corresponding appendices and geotagged photos taken during the aforementioned activity.

For information and record.

*For and in the absence of the OIC, PENR Officer*

**ROMUALDO S. TRIAS**  
Land Management Officer III  
Chief, Monitoring and Enforcement Section

TSD/CDS 11/23/2023  
Copy furnished:

1. Planning Section
2. File



Department of Environment and Natural Resources  
MIMAROPA Region  
APO REEF NATURAL PARK  
Protected Area Management Office



November 21, 2023

**MEMORANDUM**

FOR : The Regional Executive Director  
DENR MIMAROPA Region  
1515 DENR By the Bay Building, Roxas Boulevard,  
Barangay 688, Ermita, Manila

THRU : The OIC, PENR Officer

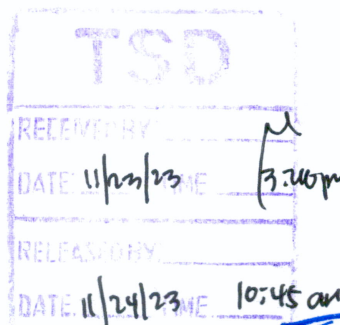
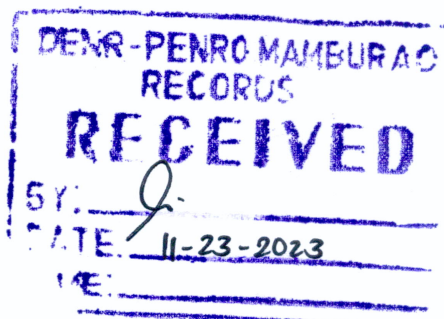
FROM : The CENR Officer

SUBJECT : SUBMISSION OF ANNUAL REPORT FOR THE WATER  
QUALITY MONITORING OF APO REEF NATURAL PARK  
FOR CY 2023

Respectfully forwarded is the Annual Report for Water Quality Monitoring of Apo Reef Natural Park – Protected Area Management Office (ARNP-PAMO) for CY 2023. The report includes the results of the laboratory analyses of samples collected and transported to Optimal Laboratories, Inc. in Lipa, Batangas on Quarter 1 and Quarter 3. The Class SA standard for surface water for most parameters was met. However, oil and grease levels in the monitoring stations (2-9 mg/L) remain to be above the permissible threshold of 1 mg/L.

Attached herewith is the narrative report with its corresponding appendices.

For information and record.



FOR. ANASTACIO A. SANTOS, MPA





Department of Environment and Natural Resources  
MIMAROPA Region  
APO REEF NATURAL PARK  
Protected Area Management Office



November 21, 2023

**MEMORANDUM**

FOR : The Regional Executive Director  
1515 DENR By the Bay Building, Roxas Boulevard,  
Barangay 668, Ermita, Manila

THRU : The OIC, PENR Officer  
Mamburao, Occidental Mindoro

The CENR Officer

FROM : The Protected Area Superintendent

SUBJECT : SUBMISSION OF ANNUAL REPORT FOR THE WATER  
QUALITY MONITORING OF APO REEF NATURAL PARK  
FOR CY 2023

Respectfully submitted is the Annual Report for the Water Quality Monitoring of Apo Reef Natural Park for CY 2023. The results of the laboratory analyses and in-situ measurements made using the water quality checker. Most of the stations passed the standard based on DAO 2016-08, except that of TIEZA. As for the parameter, all stations failed the oil and grease analysis which may be attributed to the presence of motorized banca in the Protected Area.

Attached herewith are the narrative report and its corresponding appendices.

For your information and record.

  
KRYSTAL DAYNE T. VILLANADA

## I. INTRODUCTION

Water quality is an important factor in coastal and marine ecosystems. It impacts the species richness or the number of species present in a community within an ecosystem among others (Johnston & Roberts, 2009). However, human activities have continuously caused a decrease in water quality, driving the degradation of coastal and marine ecosystems worldwide. For instance, harmful algal blooms (HABs), likely caused by anthropogenic nutrient enrichment, has led to large fish kills in Asia (Furuya et al., 2018). Outbreaks of Crown-of-Thorns Starfish (CoTS), which has resulted to large-scale coral declines, are also widely hypothesized to be linked to anthropogenic nutrient enrichment (Wooldridge & Brodie, 2015; Brodie et al., 2017). This is why the monitoring and improvement of water quality is critical to the management of coastal and marine resources.

Water quality monitoring is vital in developing policies and management decisions for water bodies, especially those that are delegated as Protected Areas (PAs) like Apo Reef Natural Park (ARNP). In the Philippines, the implementation of the Coastal and Marine Ecosystems Management Program (CMEMP), under the supervision of the DENR Biodiversity Management Bureau, includes Water Quality Monitoring (WQM) within legislated NIPAS PAs as a subcomponent. It aims to quantify the pollution load and other water parameters that indicate pollution in PAs. This is the third year of implementation of this subcomponent of CMEMP in ARNP.

The water quality in Apo Reef Natural Park is monitored twice yearly, covering the dry and wet seasons. The following are the specific objectives of the WQM in ARNP this year:

1. To collect data on water quality parameters in the nine monitoring stations; and,
2. To implement necessary management actions.

## II. METHODOLOGY

### *Monitoring stations*

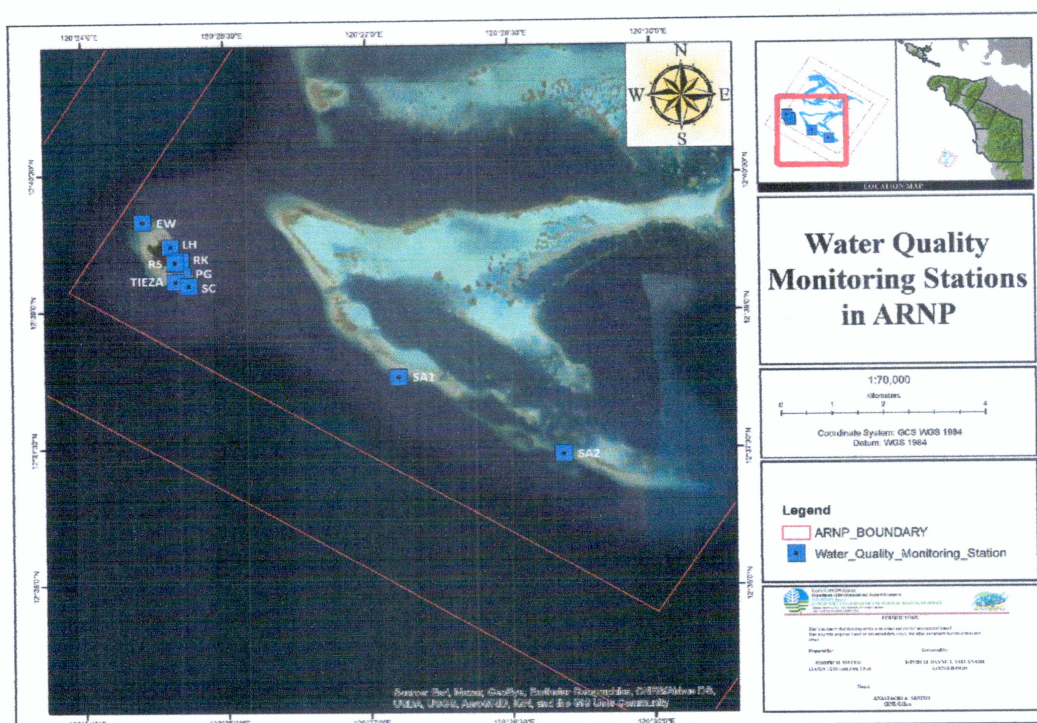
There are nine permanent WQM stations in ARNP (Table 1; Figure 1). Two of which were recently established by virtue of PAMB Resolution No. 2023-005: South Corner and TIEZA. The monitoring stations are distributed across the two different management zones of ARNP. Six monitoring stations are within the Multiple-Use Zone, while the remaining three are within the Strict Protection Zone.

The WQM involved the sampling of both surface water and groundwater, and seven of the nine monitoring stations were sampled for surface water. Three of which were located along the bathing beach in Apo Island (Lighthouse, Picnic Ground, and Ranger's Kiosk). These sites were less than 1 m in depth and situated at least 300 meters away from each other following the guidelines of DENR EMB (2008). The depth in the three other stations sampled for surface water (Ego Wall, San Antonio 1, San Antonio 2, and South Corner) were approximately 10 m.



**Table 1.** Water quality standards for Class SA water bodies.

WQM Station	Abbreviation	Sample Source	Management Zone
TIEZA Bldg. Groundwater Well	TIEZA	Groundwater	MUZ
Ranger's Station Groundwater Well	RS	Groundwater	MUZ
East of Lighthouse	LH	Surface water	MUZ
East of Ranger's Kiosk	RK	Surface water	MUZ
East of Picnic Ground	PG	Surface water	MUZ
Ego Wall	EW	Surface water	MUZ
San Antonio 1	SA1	Surface water	SPZ
San Antonio 2	SA2	Surface water	SPZ
South Corner	SC	Surface water	MUZ



**Figure 1.** Map of the nine water quality monitoring stations sampled on March 2, 2023.

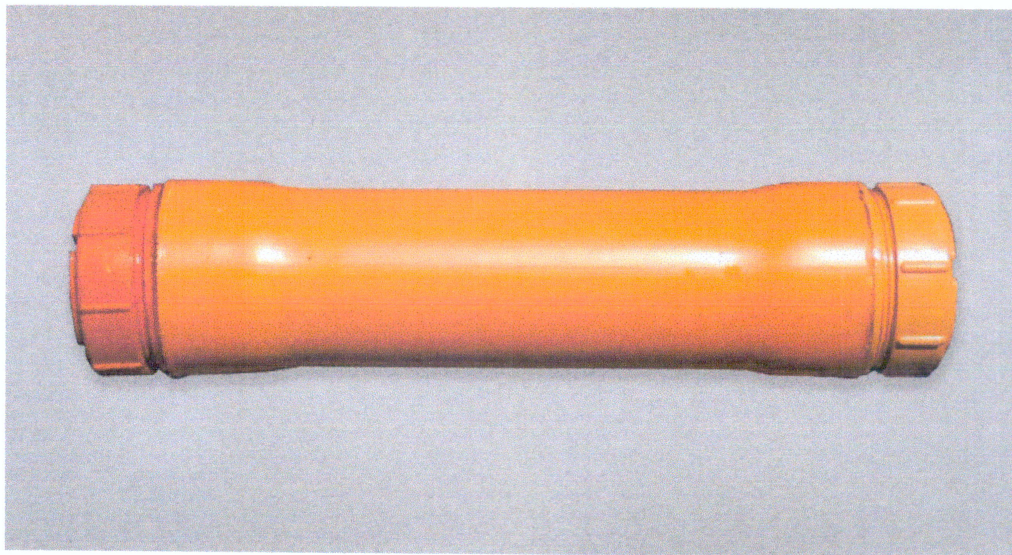
Two of the nine monitoring stations were sampled for groundwater: the groundwater well at the Ranger's Station and the other one at the Administrative Building (TIEZA). The water from these groundwater wells is regularly accessed by either tourists or management staff using a galvanized iron hand pump and an electric water pump. Both stations are adjacent to a septic tank system on the island which is a potential source for groundwater contaminants.



### *Field Collection and Laboratory Analysis*

The collection of water samples was conducted on September 7, 2023 by personnel of the Protected Area Management Office of ARNP (ARNP-PAMO). The sampling was done from 4:00 AM to 7:30 AM, to ensure that the samples reach Optimal Laboratories Inc. in Lipa, Batangas on the same day. Air temperature, percent cloud cover, weather condition, and visual color of water were noted prior to the collection of water samples in each site. Dissolved oxygen (DO), pH, and temperature were then measured in-situ using the U-51 multiparameter water quality checker (HORIBA, Kyoto, Japan). In sites with depths greater than 5 m, the measurement was done at three different depths and then averaged. The water quality checker was also used to measure DO and pH while purging out the stagnant water from the groundwater well.

Two grab sampling methods were employed during the activity: discrete and depth-integrated. Discrete grab sampling was used to sample water from the groundwater wells (Ranger's Station and TIEZA) and monitoring stations along the bathing beach (Picnic Ground, Ranger's Kiosk, and Lighthouse). Sampling was done directly using the sample containers which were as follows: 1 L wide-mouthed glass, 2 L plastic container, and sterile glass bottle. On the other hand, depth-integrated sampling was used in sites with depths greater than 5 m (Ego Wall, San Antonio 1, San Antonio 2, and South Corner). Water from surface (0.10-0.50 m), middle layer (~5 m), and near-bottom depth (9.5-10 m) was collected using an improvised PVC sampling device (Figure 2). Three PVC sampling device were tied to a 10-m rope at the mentioned depths. Unlike Van Dorn samplers which feature messengers, two divers manually closed the stoppers of each sampling device. The water samples from the three different depths were then poured into similar sampling containers and mixed.



**Figure 2.** PVC sampling device used in collecting samples from different depths (surface, middle-layer, and near-bottom) at Ego Wall.

All samples were immediately stored in a cooler filled with ice to preserve the samples by maintaining the temperature at approximately 4°C. The samples were then transported to Optimal Laboratories Inc. in Lipa, Batangas from 7:30 AM to 3:00 PM. Seven water quality parameters were measured in the laboratory (Table 2).

**Table 2.** Methods used in measuring the water quality parameters for the CY 2023.

<b>Water Quality Parameter</b>	<b>Method</b>
Color	Visual Comparison
Total Suspended Solids	Gravimetric Dried at 103-105°C
Fecal Coliform Count	Multiple Tube Fermentation
Nitrate	Brucine Colorimetric
Phosphate	Stannous Chloride
Surfactants	Anionic Surfactants as MBAS
Oil & Grease	LLP-Gravimetric (PET)

#### *Data Analysis*

The results were then compared to standards based on intended beneficial use (DENR EMB, 2008). Specifically, the results for the surface water were compared to the standards for Class SA (Protected Waters and Fishery Class I), which is the highest classification for marine waters (Table 3). The DENR Department Administrative Order (DAO) No. 2016-08 as amended by DAO No. 2021-19 were primarily used as reference for the permissible thresholds per parameter.

**Table 3.** Water quality standards for Class SA water bodies.

Water Quality Parameter	Class SA
Temperature (°C)	26-30
Dissolved Oxygen (mg/L)	6
pH	7.0-8.5
Color	5
Total Suspended Solids (mg/L)	25
Fecal Coliform Count (MPN/100 mL)	<1.1
Nitrate (mg/L)	10
Phosphate (mg/L)	0.1
Surfactants (mg/L)	0.3
Oil & Grease (mg/L)	1

### III. RESULTS AND DISCUSSION

#### *Physical Parameters*

All stations passed the water quality standards set by the DENR EMB for the three physical parameters measured: color, temperature, and total suspended solids (Table 4). The concentrations for suspended solids across the stations, which ranged from 1 to 13 mg/L, were well within the permissible thresholds for Class SA ( $\leq 25$  mg/L) water bodies. The low TSS in ARNP may be attributed to its remote location and consequently, distance from human activities that increase sediment loads in marine environments such as mining and dredging operations, coastal development, and agriculture. Elevated TSS concentrations have been correlated with coral degradation (Flores et al., 2012; Parwati et al., 2013) hence, the low TSS concentrations are favorable to coral reefs within ARNP.



**Table 4.** Color, temperature, and total suspended solids measurements in the nine water quality monitoring stations in ARNP.

Parameters	Measurements								
	EW	LH	PG	RK	RS	SA1	SA2	SEC	TIEZA
Temperature (°C)	29.77	29.56	29.71	29.54	28.92	30.10	29.93	29.76	29.27
Color (TCU)	<5	5	<5	<5	<5	<5	<5	<3	10
Total Suspended Solids (mg/L)	6	17	21	14	2	12	14	12	7

#### *Biological Parameters*

Eight stations in ARNP had low fecal coliform counts (FCC), ranging from <1.8 to 78 MPN/100 mL (Table 5). These concentrations pass the set standards for Class SA water bodies which are 20 MPN/100 mL. FCC in groundwater wells near the septic tanks were below the detection limit (<1.8 MPN/100 mL) thus, water from these groundwater wells may be continuously used as domestic water supply. Similarly, the bathing beach and dive sites are deemed safe for full body contact recreation because the FCC in these stations only ranged from <1.8 to 4.5 MPN/100 mL. On the other hand, FCC in TIEZA has reached up 1,300 MPN/100 mL. This may be due to error in collecting water samples, as the generator pump of the water tank stopped working halfway.

**Table 5.** Fecal coliform counts in the nine monitoring stations in ARNP.

Parameters	Measurements								
	EW	LH	PG	RK	RS	SA1	SA2	SEC	TIEZA
Fecal Coliform Count (MPN/100mL)	78	<1.8	<1.8	<1.8	7.8	<1.8	4	<1.8	1,300

*Values in red mark measurement that failed standards set by DENR EMB.*

#### *Chemical Parameters*

All monitoring stations passed the set standards for the following chemical parameters: nitrate and surfactants (Table 6). It is, however, important to note that the nitrate level at the groundwater well at TIEZA (0.12 mg/L) was the highest among the stations. The phosphate concentration in this station was beyond the permissible threshold for Class SA water bodies (0.1 mg/L). Sewer leakage remains to be one of the potential sources of the higher nutrient levels in the station even if FCC was low (>1.8 MPN/100 mL). This is because the movement of coliform and nutrients in groundwater through an aquifer may vary. For instance, Entry & Farmer (2001) recorded lower fecal coliform but higher NO<sub>3</sub> concentrations in water flowing across a sand aquifer. Despite these findings in the groundwater well at TIEZA, nutrient levels in majority of the stations were low. Minimizing nutrient input into the marine environment is

important because these may cause HABs (Furuya et al., 2018) and facilitate or exacerbate CoTS Outbreaks (Wooldridge & Brodie, 2015; Brodie et al., 2017). In stations (LH, RS, and TIEZA) with lower pH level, the acidity could suggest that there is a higher activity of hydrogen ions (Li and Liu, 2019).

The results in DO have shown that only PG, RK, and SA2 only passed the standards set by DENR EMB. However, DO level of EW, LH, SA1, and SEC were considered within the range of DO (not less than 5 mg/L) that can support aquatic life and is not polluted (Bozorg-Haddad et al., 2021). None of the monitoring stations passed the set standards for oil and grease (1 mg/L). The likely cause of the increased oil and grease levels across the monitoring stations (2-9 mg/L) is anthropogenic. It may be specifically attributed to marine transportation activities within and proximal to ARNP. The MPA is proximal to domestic shipping routes, particularly long-distance primary routes which connect major ports in the country (MARINA, 2018). Ropax vessels (RoRo passenger-cargo vessels) and cargo vessels including container and tanker ships are serving mainly for these routes (JICA, 2005). These vessels release oil into the sea in their routine operations, and as a result of major accidents like collisions and groundings. Other vessels such as commercial and small-scale fishing boats and recreational boats may also be contributing to oil pollution in ARNP.

**Table 6.** Dissolved oxygen, phosphate, pH, and oil and grease measurements in the seven water quality monitoring stations.

Parameters	Measurements								
	EW	LH	PG	RK	RS	SA1	SA2	SEC	TIEZA
Dissolved Oxygen (mg/L)	*5.74	*5.37	6.73	6.85	3.51	*5.44	6.02	*5.59	3.93
Nitrate as NO <sub>3</sub> -N (mg/L)	0.17	0.34	0.11	0.16	0.70	<0.06	0.13	0.12	1.96
Oil and grease (mg/L)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	2.00	3.00
pH (Range)	7.16	6.96	7.00	7.01	6.20	7.52	7.67	7.36	6.63
Phosphate (mg/L)	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.12
Surfactants (mg/L)	0.27	0.23	0.25	0.17	0.19	0.23	0.19	0.21	0.19

*Values in red mark measurement that failed standards set by DENR EMB.*

*Values in asterisk are considered within the range of DO (Bozorg-Haddad et al., 2021).*

Refer to Annex B for the comparison of results in Q1 and Q3.



#### **IV. CONCLUSIONS AND RECOMMENDATIONS**

Nine monitoring stations were sampled for surface water and groundwater on September 7, 2023. Two of these monitoring stations (South Corner and TIEZA) were recently established by virtue of PAMB Resolution No. 2023-005. Of the seven parameters tested, all nine monitoring stations failed the Oil and Grease standard for Class SA (1 mg/L) which could be attributed to the presence of motorized boats entering the Protected Area. Among all stations, TIEZA was shown to fail most of the parameters, probably due to the presence of sewage near the sampling site, which was reflected in the presence of high FCC.

Low measurements in DO especially at the Rangers Station and TIEZA were probably due the time the samples were taken, as well as the temperature recorded – 28.92 for RS and 29.27 for TIEZA. High temperatures result to lower DO level. Sampling time may be adjusted accordingly as more equipment and watercraft becomes available.

A regular monitoring of water quality in this station and inspection of the nearby septic tank system are recommended. Monthly sampling using with multiparameter probe could also help with the identification of water quality trend. The ARNP-PAMO personnel, as well as those of the LGU could be trained to do proper sampling as to lessen human error.

Prepared by:

Reviewed and submitted by:

  
**JANE FRANCES T. SENOSA**  
CMEMP Extension Officer

  
**KRYSTAL DAYNE T. VILLANADA**  
Protected Area Superintendent



## V. REFERENCES

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## VI. APPENDICES

### Appendix A. Participants of the water sampling.

Table A.1. List of participants for the water quality monitoring done last March 2, 2023.

Name	Position	Office
Krystal Dayne T. Villanada	Protected Area Superintendent	ARNP-PAMO
Anna Ritchelle D. Nicanor	Park Maintenance Foreman	ARNP-PAMO
Roberto P. Beringuela	Park Maintenance Foreman	ARNP-PAMO
Efraim Z. Pagador	Forest Ranger	ARNP-PAMO
Romel M. Pacaul	Boat Captain	ARNP-PAMO
Mark Dennis M. Barretto	Boat Captain	ARNP-PAMO
Raymart R. Dangelos	Boat Crew	ARNP-PAMO
Temart E. Rebato	Park Ranger	ARNP-PAMO
Kelvin U. Zubiri	Park Ranger	ARNP-PAMO
Federico A. de Jesus	Park Ranger	ARNP-PAMO
Sherwin R. Benoza	Park Ranger	ARNP-PAMO
Salvador M. Ciasico	Park Ranger	MENRO Sablayan
Elpidio Amores	Park Ranger	MENRO Sablayan

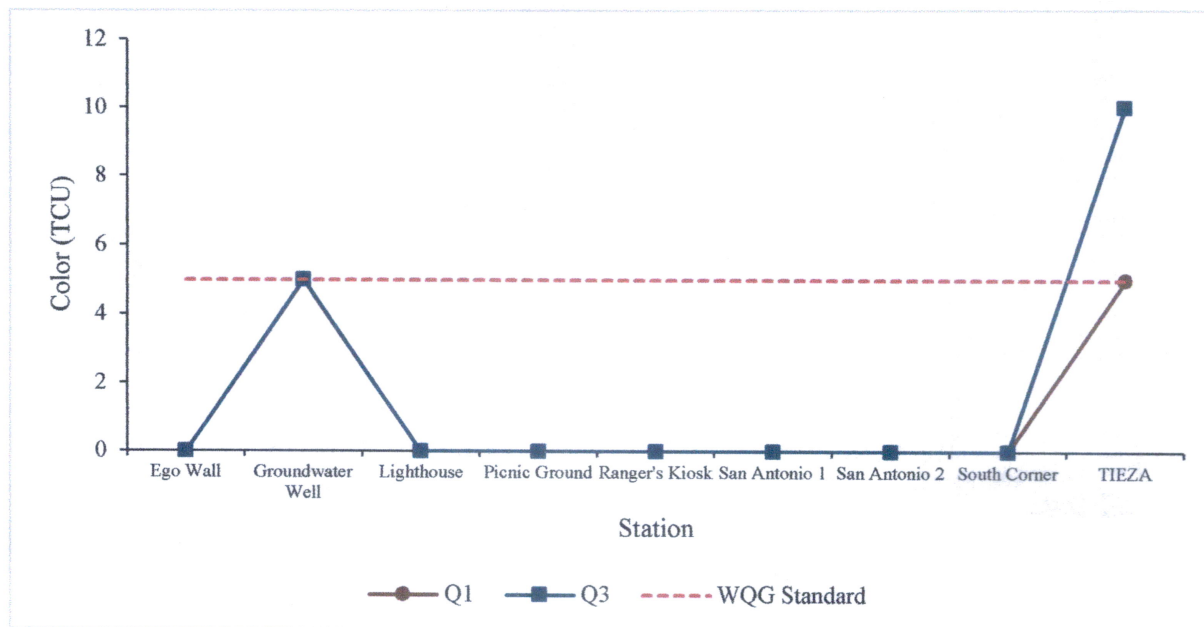


Table A.2. List of participants for the water quality monitoring done last September 7, 2023.

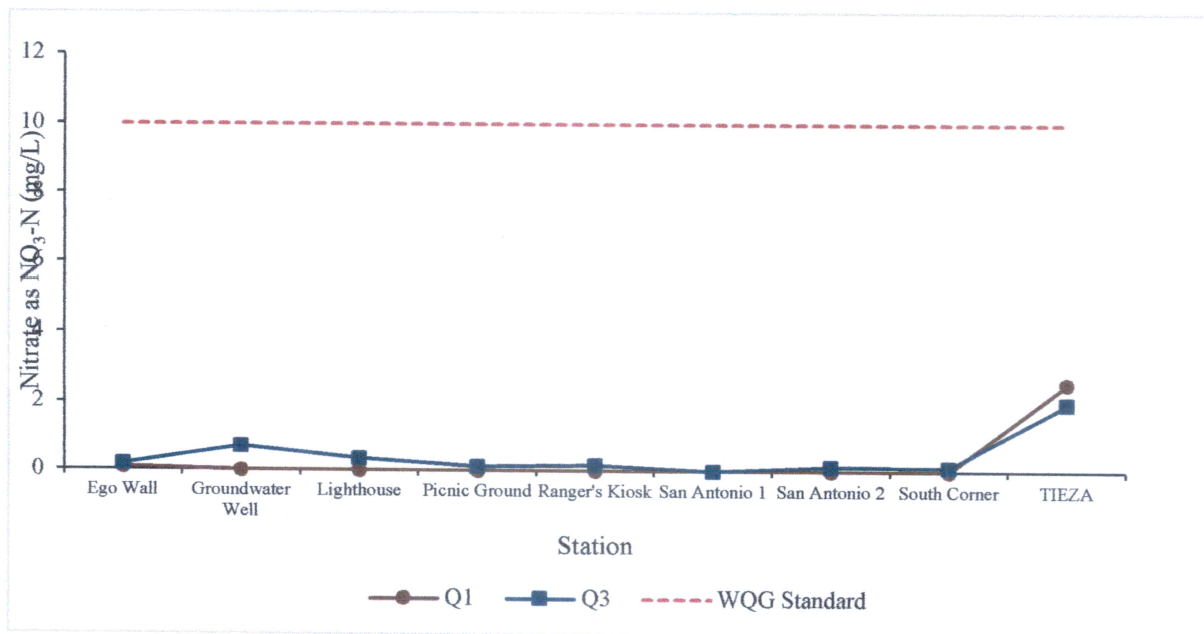
<b>Name</b>	<b>Position</b>	<b>Office</b>
Krystal Dayne T. Villanada	Protected Area Superintendent	ARNP-PAMO
Anna Ritchelle D. Nicanor	Park Maintenance Foreman	ARNP-PAMO
Jane Frances T. Senosa	CMEMP Extension Officer	ARNP-PAMO
Roberto P. Beringuela	Park Maintenance Foreman	ARNP-PAMO
Mark Dennis M. Barretto	Boat Captain	ARNP-PAMO
Raymart R. Dangeros	Boat Crew	ARNP-PAMO
Jun G. Serquiña	Park Ranger	ARNP-PAMO
Temart E. Rebito	Park Ranger	ARNP-PAMO
Kelvin U. Zubiri	Park Ranger	ARNP-PAMO
Federico A. de Jesus	Park Ranger	ARNP-PAMO
Sherwin R. Benozza	Park Ranger	ARNP-PAMO
Jhover C. Tibang	Park Ranger	ARNP-PAMO



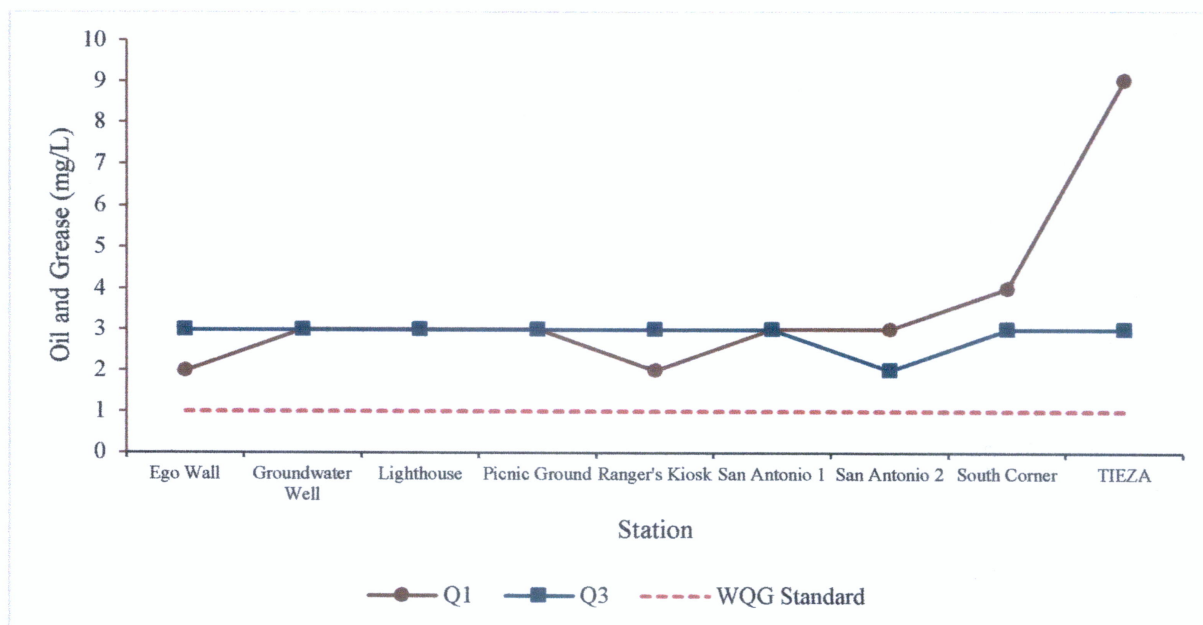
**Appendix B.** Comparison of water quality data between Q1 and Q3 2023.



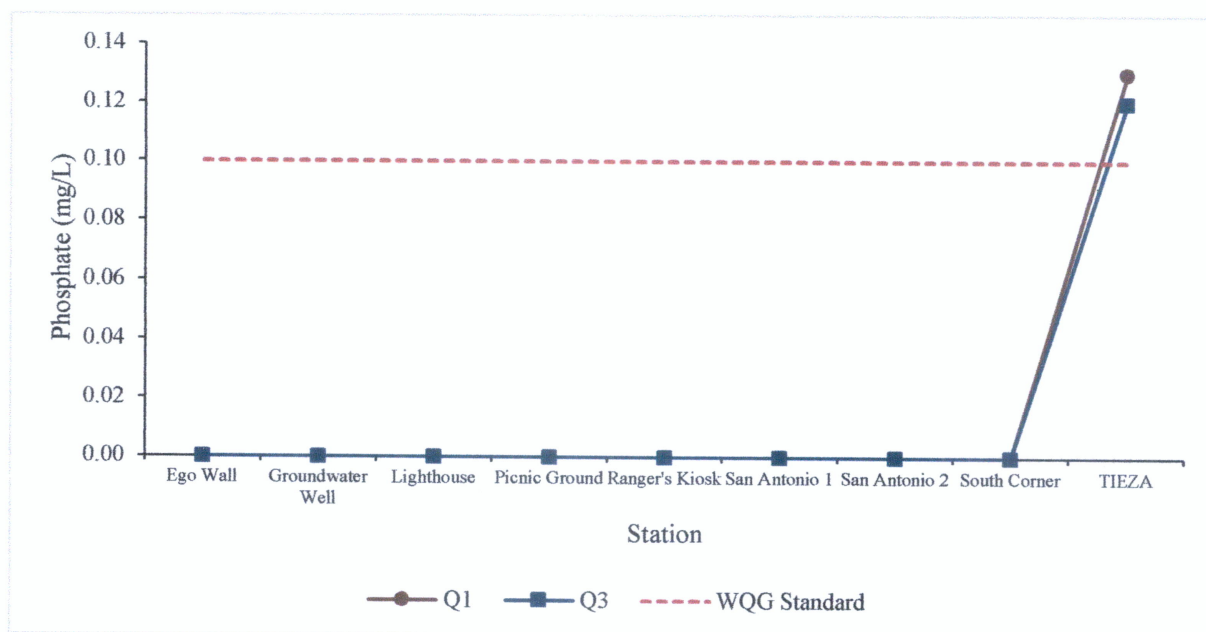
**Fig. B.1.** Result of Color (TCU) of the sampling stations on Q1 and Q3 with the standard set by DAO 2016-08.



**Fig. B.2.** Result of Nitrate as  $\text{NO}_3\text{-N}$  (mg/L) of the sampling stations on Q1 and Q3 with the standard set by DAO 2016-08.

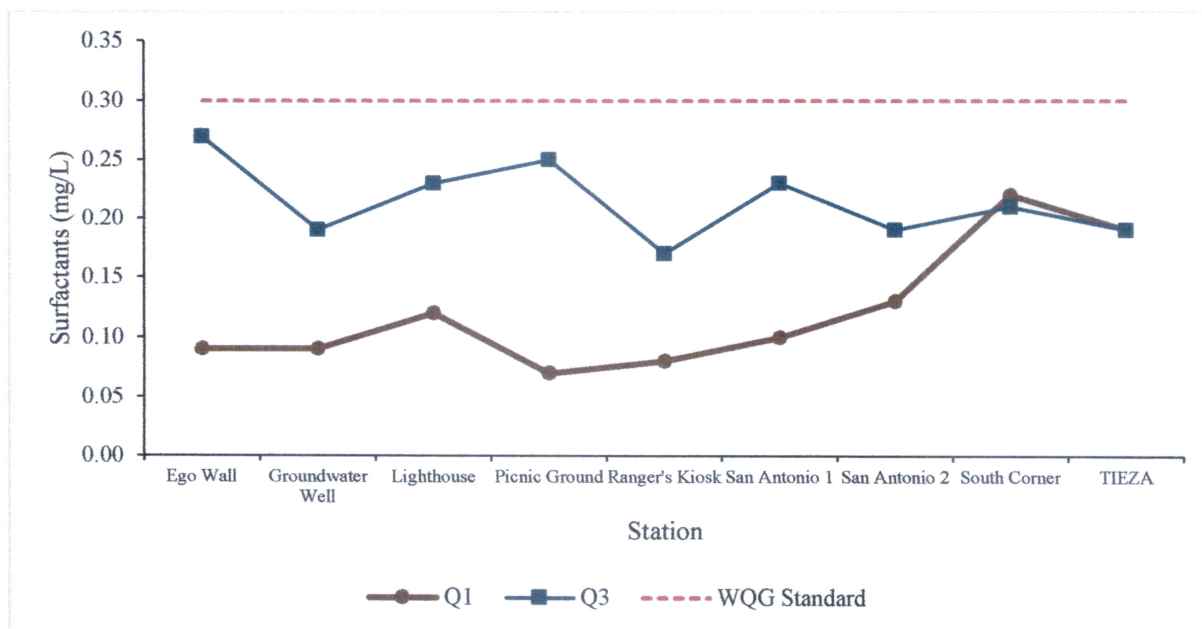


**Fig. B.3.** Result of Oil and Grease (mg/L) of the sampling stations on Q1 and Q3 with the standard set by DAO 2016-08.

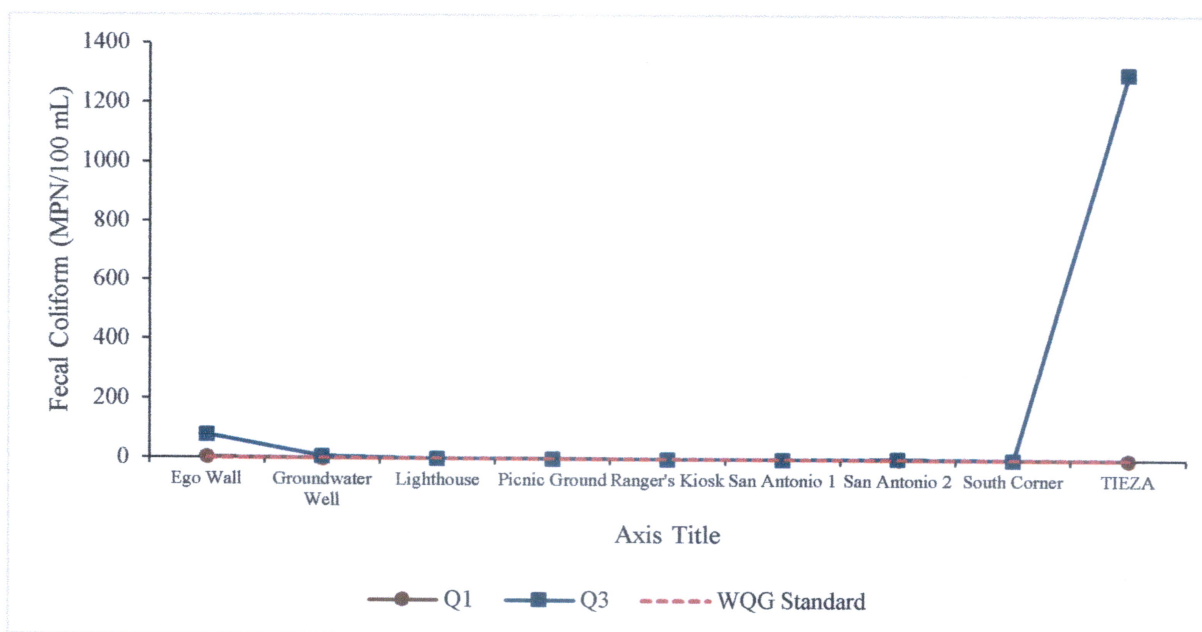


**Fig. B.4.** Result of Phosphate (mg/L) of the sampling stations on Q1 and Q3 with the standard set by DAO 2016-08.

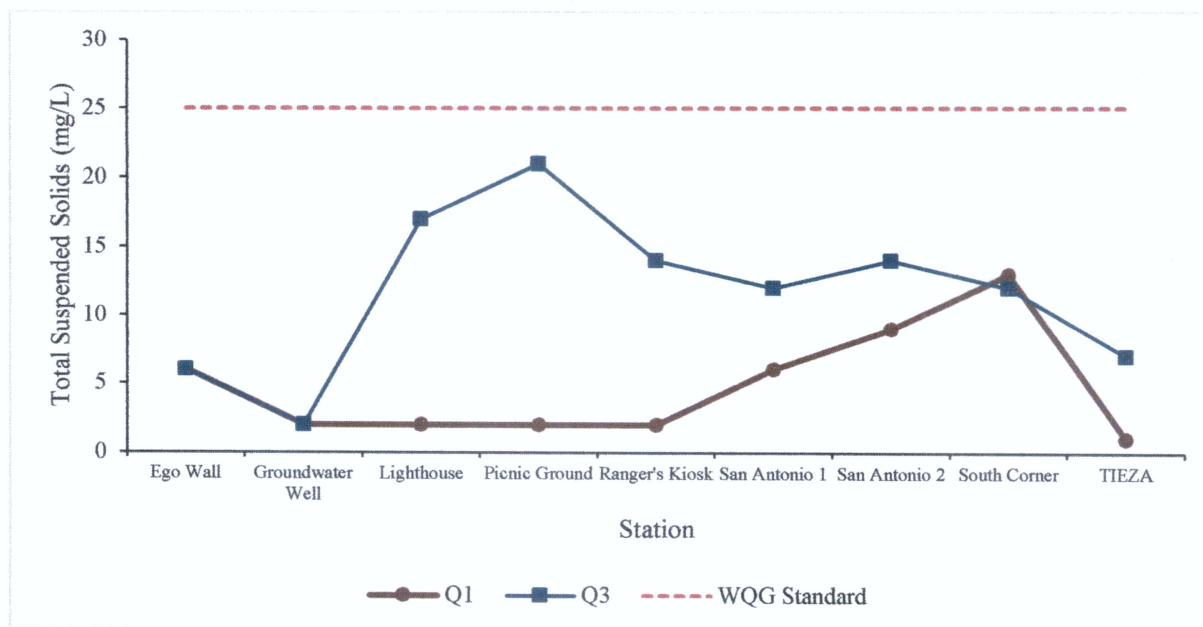




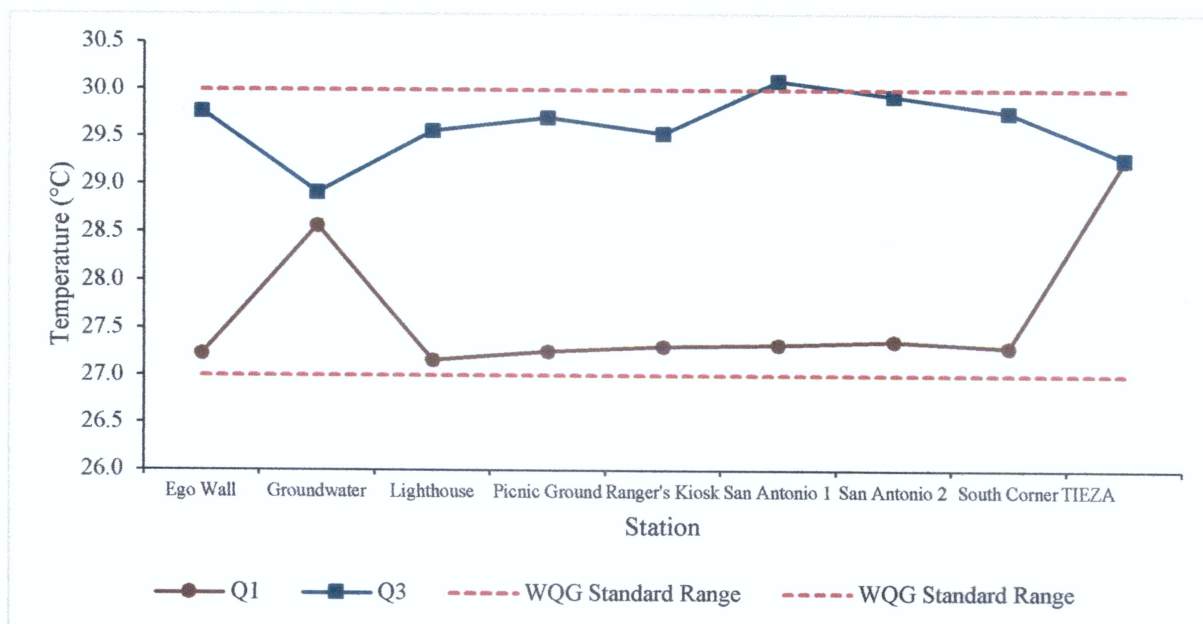
**Fig. B.5.** Result of Surfactants (mg/L) of the sampling stations on Q1 and Q3 with the standard set by DAO 2016-08.



**Fig. B.6.** Result of Fecal Coliform (MPN/100 mL) of the sampling stations on Q1 and Q3 with the standard set by DAO 2016-08.

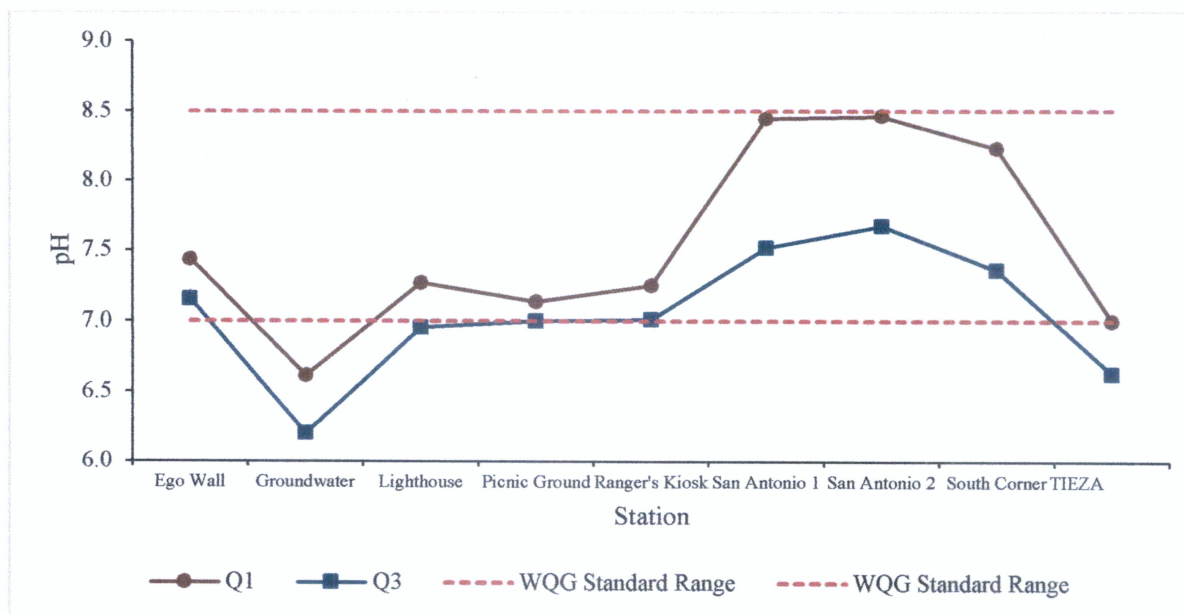


**Fig. B.7.** Result of Total Suspended Solids (mg/L) of the sampling stations on Q1 and Q3 with the standard set by DAO 2016-08.

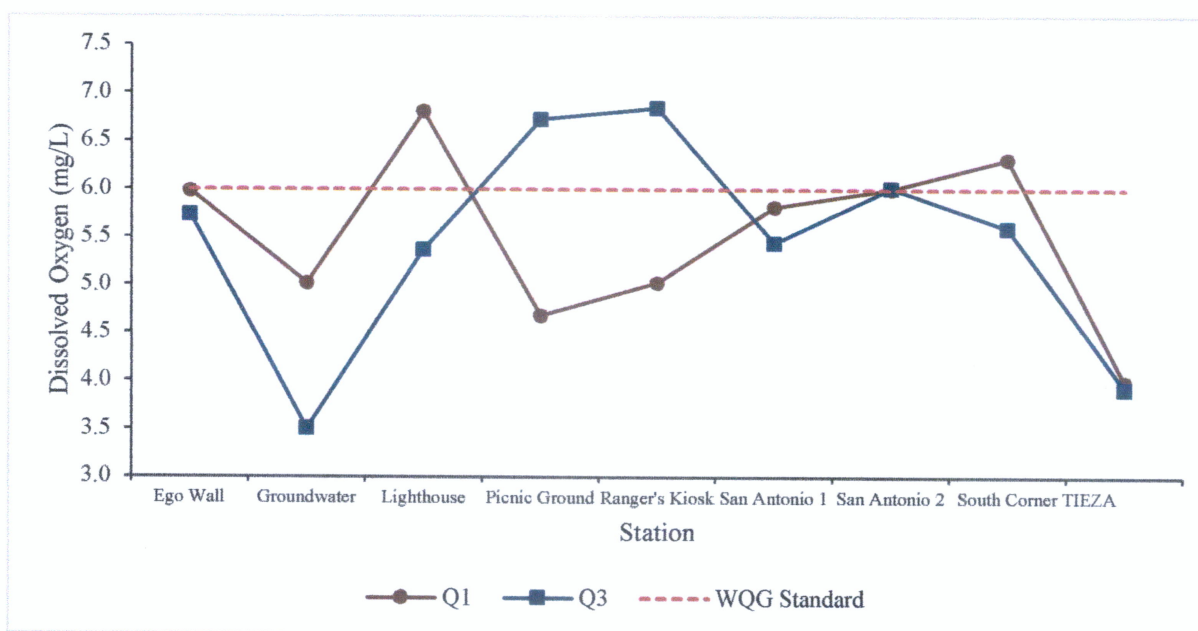


**Fig. B.8.** Result of Temperature (°C) of the sampling stations on Q1 and Q3 with the standard set by DAO 2016-08.






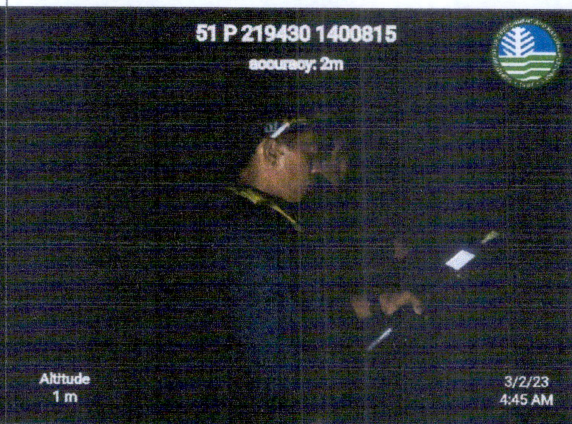

**Fig. B.9.** Result of pH of the sampling stations on Q1 and Q3 with the standard set by DAO 2016-08.



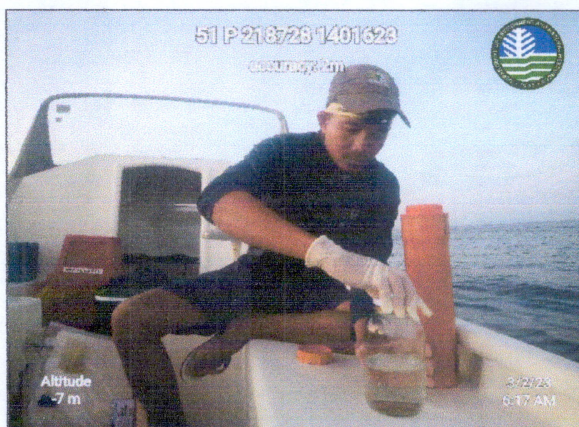
**Fig. B.10.** Result of Dissolved Oxygen (mg/L) of the sampling stations on Q1 and Q3 with the standard set by DAO 2016-08.



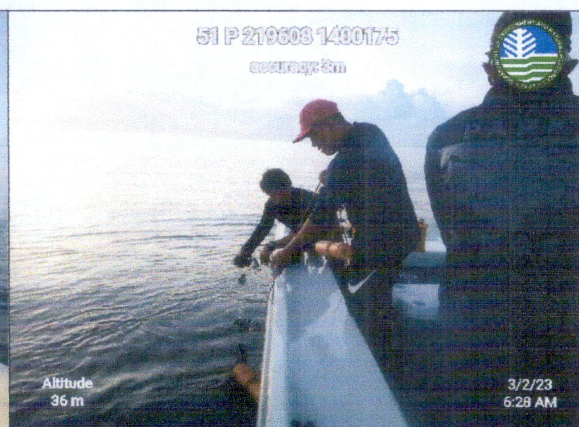
**Appendix C.** Photodocumentation of the water sampling in the nine monitoring stations in Apo Reef Natural Park on March 2, 2023.

	
<p>PAMO Staff purging stagnant water out of the groundwater well at the Ranger's Station</p>	<p>Park Ranger Kelvin Zubiri (right) collecting water samples in front of the lighthouse</p>
	
<p>Park Ranger Kelvin Zubiri (left) and PASu Villanada measuring DO, pH, and temperature in-situ</p>	<p>Boat Captain Mark Barretto (left) and PASu Krystal Villanada measuring parameters in-situ in front of the Ranger's Kiosk</p>
	
<p>Boat Captain Romel M. Pacaul transferring the groundwater samples collected in front of the Ranger's Kiosk into the cooler</p>	<p>PASu Krystal Villanada measuring several water quality parameters in-situ at Ego Wall</p>

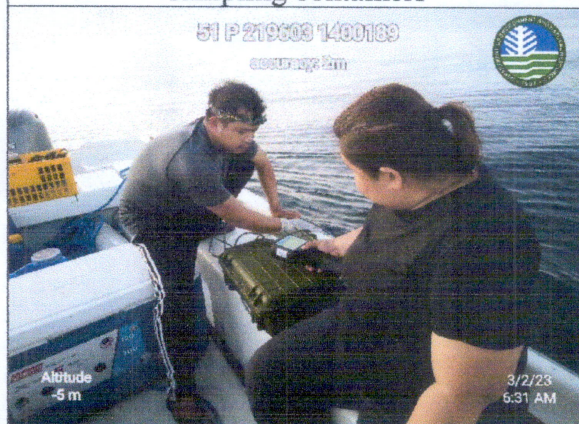




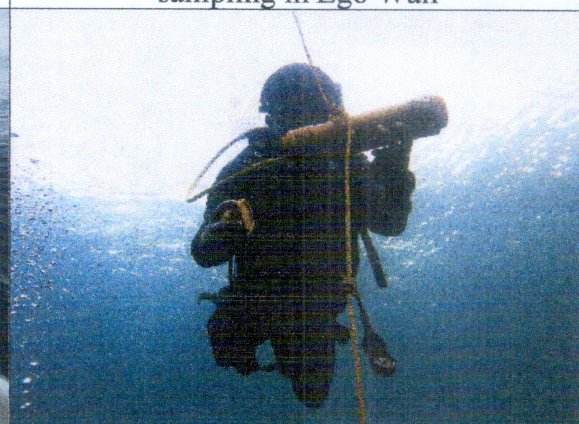
Boat Captain Romel M. Pacaul transferring water samples from the sampler into the sampling containers



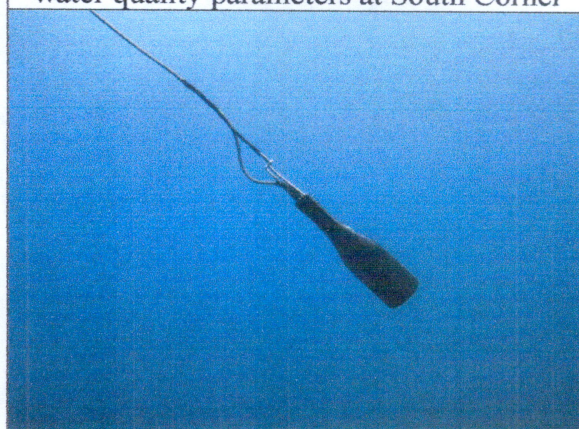
Park Ranger Federico de Jesus (middle) retrieving the water samplers during the sampling in Ego Wall



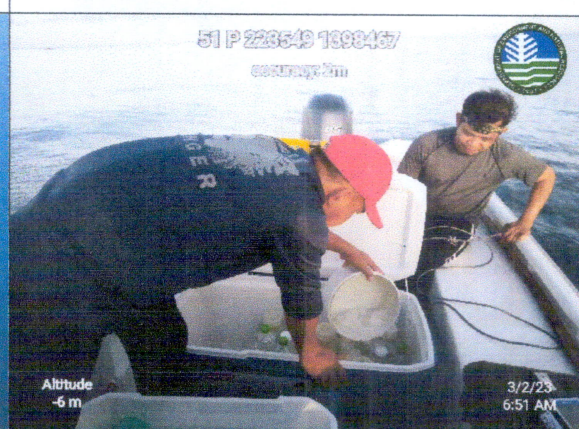
Park Ranger Kelvin Zubiri (left) assisting the probe during the in-situ measurement water quality parameters at South Corner



Boat Captain Mark Barretto closing a PVC water sampler at Ego Wall



U-51 multiparameter water quality checker probe submerged approximately 5 m at Ego Wall



Park Ranger Federico de Jesus (left) adding ice into the cooler for the preservation of water samples during transport





Boat Captain Romel Pacaul (right) washing the sampler prior to the collection of water samples at South Corner



Boat Captain Romel Pacaul (left) and Park Ranger Kelvin Zubiri transferring water samples from the sampler



PASu Krystal Villanada (right) submitting finalizing the chain of custody forms for the laboratory analyses of the water samples



SCDO Anna Ritchelle Nicanor checking the documents received from Optimal Laboratories Inc.



**Appendix D.** Photo-documentation of the water sampling in the nine monitoring stations in Apo Reef Natural Park on September 7, 2023.

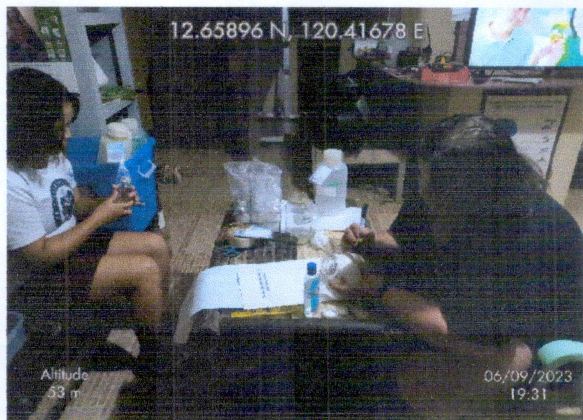


Figure D.1. Preparation and labelling of sampling bottles.



Figure D.2. Park Rangers pumping of groundwater of Ranger's Station.



Figure D.3. Using of multiparameter probe to check the water quality of the groundwater of Ranger's Station.



Figure D.4. Storing of water samples in an ice box.

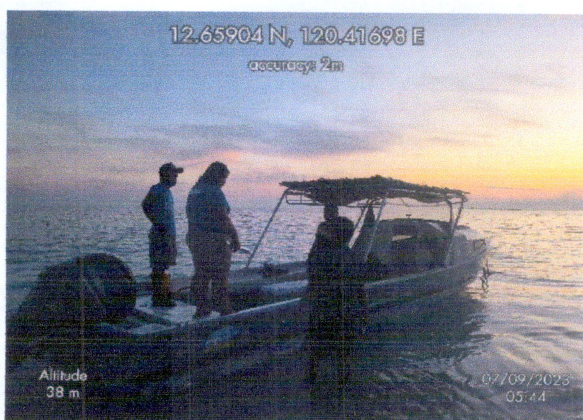


Figure D.5. Preparation to visit the dive sites for water sampling.

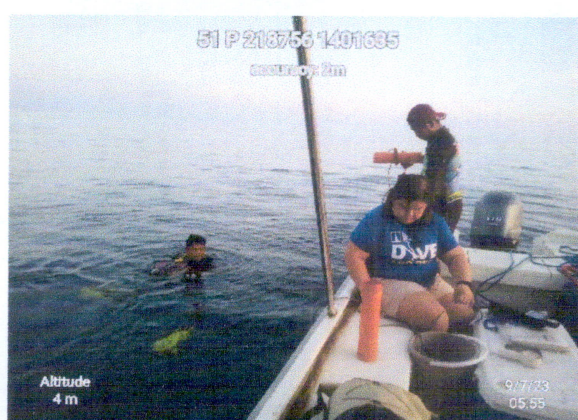


Figure D.6. PASu Villanada and the Park Rangers collecting water samples at Ego Wall.





Figure D.7. Park Ranger Rebito collecting water samples at Ego Wall.



Figure D.8. PASu Villanada putting fixation for the oil and grease samples.



Figure D.9. PASu Villanada signing paperworks at the Optimal Laboratories, Inc.

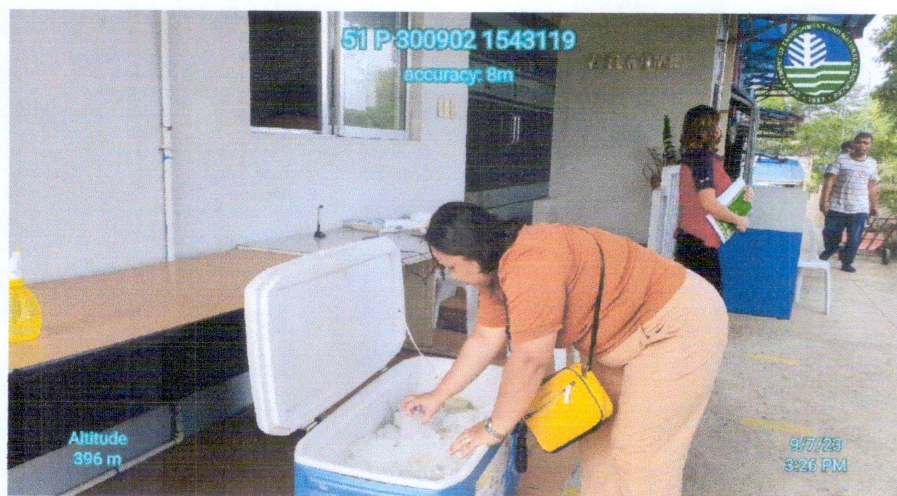
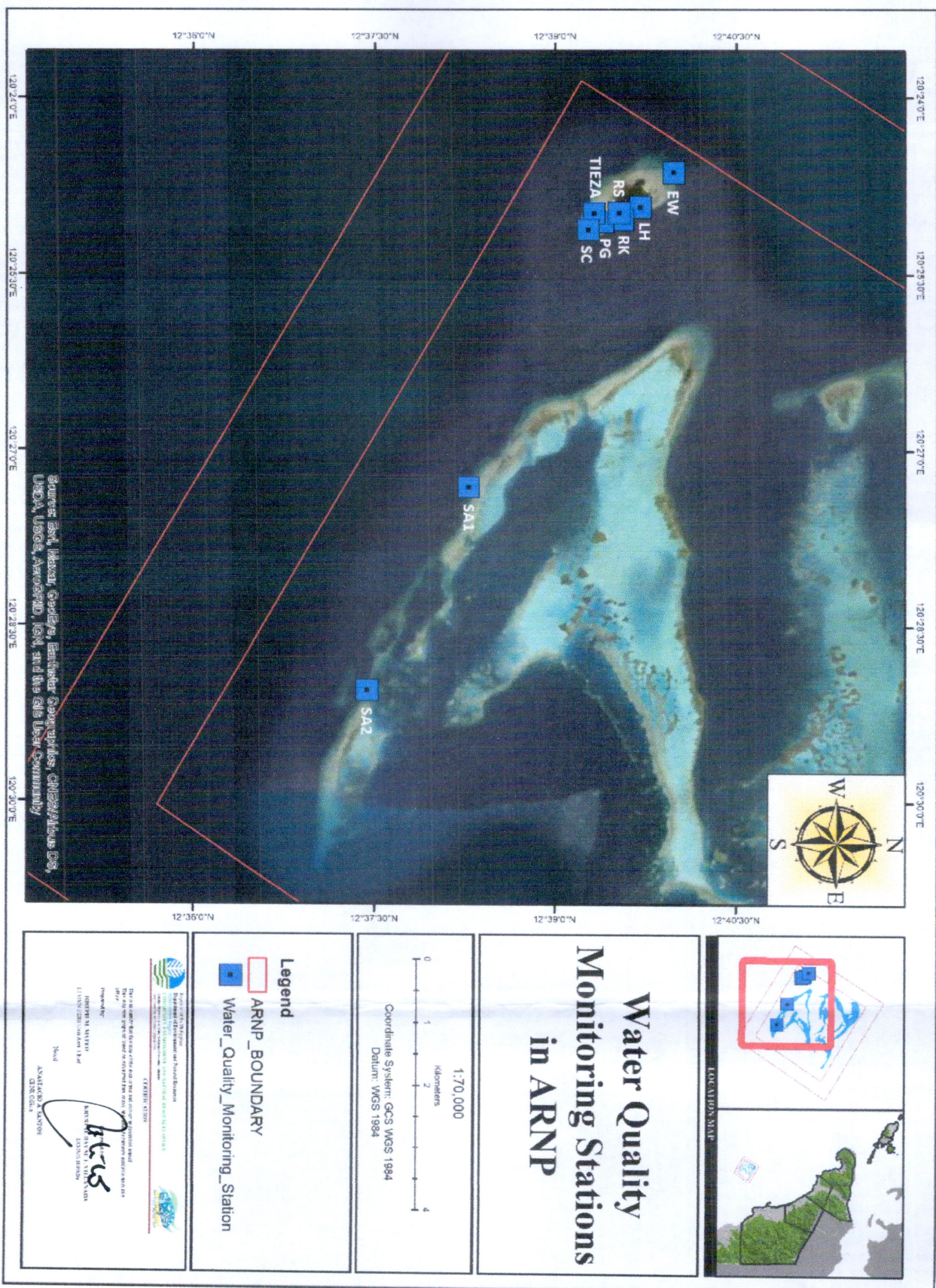


Figure D.10. SCDO Nicanor retrieving samples to be given to the laboratory technicians.



#### Appendix E. Map showing the nine water quality monitoring stations in Apo Reef Natural Park





## Appendix F. Results of the laboratory analyses of samples collected on March 2, 2023



Department of Environment and Natural Resources • DA - Bureau of Animal Industry • Department of Health • Food and Drug Administration



F-PR-07-08/02  
Iss.03 Rev. 02  
Effectivity: September 22, 2022

### CERTIFICATE OF ANALYSIS

Customer : APO REEF NATURAL PARK  
Address : Brgy. Sto. Niño, Sablayan, Occidental Mindoro

Work Order : 23-02122  
Date Collected : March 02, 2023  
Date Received : March 02, 2023  
Date Analyzed : March 03, 2023 - March 09, 2023  
Date Reported : March 13, 2023  
Time Collected : 5:30 AM  
Submitted By : Customer

#### RESULTS OF ANALYSIS:

Customer Sample ID : Water - GW		Lab Sample ID: 23-02122-001
PARAMETER	METHOD	RESULT
Color (True Color)	2120 B. Visual Comparison <sup>a</sup>	5 TCU
Nitrate as NO <sub>3</sub> -N	352.1 Colorimetric, Brucine <sup>b</sup>	<0.06 mg/L
Oil and Grease	5520 B. Liquid-Liquid, Partition-Gravimetric <sup>a</sup>	3 mg/L
Phosphate as Phosphorus	4500 -P D. Stannous Chloride <sup>a</sup>	<0.03 mg/L
Surfactants (MBAS)	5540 C. Anionic Surfactants as MBAS <sup>a</sup>	0.09 mg/L
Total Suspended Solids	2540 D. Gravimetric, Dried at 103-105°C <sup>a</sup>	2 mg/L

**Sample Description/Condition:** The sample is clear with few suspended solids and received in glass and plastic containers transported with ice.

#### References:

- <sup>a</sup> Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017
- <sup>b</sup> US EPA 352.1. Standard Methods for the Examination of Water and Wastewater, 13th Edition.

Certified True and Correct by:

Ranmar Marco A. Marco, RCh  
Laboratory Analyst II  
PRC Lic. #0014151

Approved by:

Jennifer R. Maralit, RCh  
General Manager  
PRC Lic. # 0007374

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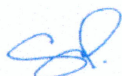


**CERTIFICATE OF ANALYSIS**Customer : APO REEF NATURAL PARK  
Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-02122  
Date Collected : March 02, 2023  
Date Received : March 02, 2023  
Date Analyzed : March 02, 2023 - March 09, 2023  
Date Reported : March 13, 2023  
Time Collected : 5:30 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

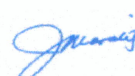
Customer Sample ID : Water - GW		Lab Sample ID: 23-02122-001
PARAMETER	METHOD	RESULT
Thermotolerant (Fecal) Coliform Count	Multiple Tube Fermentation Technique <sup>a</sup>	<1.8 MPN/100 mL

**Sample Description/Condition:** The sample is clear with few suspended solids and received in sterile bottle transported with ice.**References:** <sup>a</sup> Standard Methods for the Examination of Water and Wastewater 23rd ed. 2017

Certified True and Correct by:

Shyla May L. Quizon, RMT  
Laboratory Analyst II  
PRC Lic. #0075710Jonahdimary R. Alilio  
Laboratory Analyst III

Approved by:

Jennifer R. Maralit, RCh  
General Manager  
PRC Lic. # 0007374

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**CERTIFICATE OF ANALYSIS**Customer : APO REEF NATURAL PARK  
Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-02122  
Date Collected : March 02, 2023  
Date Received : March 02, 2023  
Date Analyzed : March 03, 2023 - March 09, 2023  
Date Reported : March 13, 2023  
Time Collected : 4:30 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

Customer Sample ID : Water - PG		Lab Sample ID: 23-02122-002
PARAMETER	METHOD	RESULT
Color (True Color)	2120 B. Visual Comparison <sup>a</sup>	<5 TCU
Nitrate as NO <sub>3</sub> -N	352.1 Colorimetric, Brucine <sup>b</sup>	<0.06 mg/L
Oil and Grease	5520 B. Liquid-Liquid, Partition-Gravimetric <sup>a</sup>	3 mg/L
Phosphate as Phosphorus	4500 -P D. Stannous Chloride <sup>a</sup>	<0.03 mg/L
Surfactants (MBAS)	5540 C. Anionic Surfactants as MBAS <sup>a</sup>	0.07 mg/L
Total Suspended Solids	2540 D. Gravimetric, Dried at 103-105°C <sup>a</sup>	2 mg/L

**Sample Description/Condition:** The sample is clear with few suspended solids and received in glass and plastic containers transported with ice.**References:**

- <sup>a</sup> Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017  
<sup>b</sup> US EPA 352.1. Standard Methods for the Examination of Water and Wastewater, 13th Edition.

Certified True and Correct by:

**Ranmar Marco A. Marco, RCh**  
Laboratory Analyst II  
PRC Lic. #0014151

Approved by:

**Jennifer R. Maralit, RCh**  
General Manager  
PRC Lic. # 0007374

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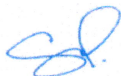
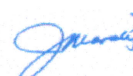
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Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-02122  
Date Collected : March 02, 2023  
Date Received : March 02, 2023  
Date Analyzed : March 02, 2023 - March 09, 2023  
Date Reported : March 13, 2023  
Time Collected : 4:30 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

Customer Sample ID : Water - PG		Lab Sample ID: 23-02122-002
PARAMETER	METHOD	RESULT
Thermotolerant (Fecal) Coliform Count	Multiple Tube Fermentation Technique <sup>a</sup>	2.0 MPN/100 mL

**Sample Description/Condition:** The sample is clear with few suspended solids and received in sterile bottle transported with ice.**References:** <sup>a</sup> Standard Methods for the Examination of Water and Wastewater 23rd ed. 2017**Certified True and Correct by:**Shyla May L. Quizon, RMT  
Laboratory Analyst II  
PRC Lic. #0075710Jonahdimary R. Alilio  
Laboratory Analyst III**Approved by:**Jennifer R. Maralit, RCh  
General Manager  
PRC Lic. # 0007374

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Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-02122  
Date Collected : March 02, 2023  
Date Received : March 02, 2023  
Date Analyzed : March 03, 2023 - March 09, 2023  
Date Reported : March 13, 2023  
Time Collected : 4:06 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

Customer Sample ID : Water - LH		Lab Sample ID: 23-02122-003
PARAMETER	METHOD	RESULT
Color (True Color)	2120 B. Visual Comparison <sup>a</sup>	<5 TCU
Nitrate as NO <sub>3</sub> -N	352.1 Colorimetric, Brucine <sup>b</sup>	<0.06 mg/L
Oil and Grease	5520 B. Liquid-Liquid, Partition-Gravimetric <sup>a</sup>	3 mg/L
Phosphate as Phosphorus	4500 -P D. Stannous Chloride <sup>a</sup>	<0.03 mg/L
Surfactants (MBAS)	5540 C. Anionic Surfactants as MBAS <sup>a</sup>	0.12 mg/L
Total Suspended Solids	2540 D. Gravimetric, Dried at 103-105°C <sup>a</sup>	2 mg/L

**Sample Description/Condition:** The sample is clear with few suspended solids and received in glass and plastic containers transported with ice.**References:**

- <sup>a</sup> Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017  
<sup>b</sup> US EPA 352.1. Standard Methods for the Examination of Water and Wastewater, 13th Edition.

Certified True and Correct by:

**Ranmar Marco A. Marco, RCh**  
Laboratory Analyst II  
PRC Lic. #0014151

Approved by:

**Jennifer R. Maralit, RCh**  
General Manager  
PRC Lic. # 0007374

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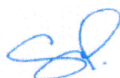
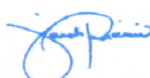

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**CERTIFICATE OF ANALYSIS**Customer : APO REEF NATURAL PARK  
Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-02122  
Date Collected : March 02, 2023  
Date Received : March 02, 2023  
Date Analyzed : March 02, 2023 - March 09, 2023  
Date Reported : March 13, 2023  
Time Collected : 4:06 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

Customer Sample ID : Water - LH		Lab Sample ID: 23-02122-003
PARAMETER	METHOD	RESULT
Thermotolerant (Fecal) Coliform Count	Multiple Tube Fermentation Technique <sup>a</sup>	<1.8 MPN/100 mL

**Sample Description/Condition:** The sample is clear with few suspended solids and received in sterile bottle transported with ice.**References:** <sup>a</sup> Standard Methods for the Examination of Water and Wastewater 23rd ed. 2017**Certified True and Correct by:**Shyla May L. Quizon, RMT  
Laboratory Analyst II  
PRC Lic. #0075710Jonahdimary R. Alilio  
Laboratory Analyst III**Approved by:**Jennifer R. Maralit, RCh  
General Manager  
PRC Lic. # 0007374

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Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-02122  
Date Collected : March 02, 2023  
Date Received : March 02, 2023  
Date Analyzed : March 03, 2023 - March 09, 2023  
Date Reported : March 13, 2023  
Time Collected : 4:40 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

Customer Sample ID : Water - RK		Lab Sample ID: 23-02122-004
PARAMETER	METHOD	RESULT
Color (True Color)	2120 B. Visual Comparison <sup>a</sup>	<5 TCU
Nitrate as NO <sub>3</sub> -N	352.1 Colorimetric, Brucine <sup>b</sup>	<0.06 mg/L
Oil and Grease	5520 B. Liquid-Liquid, Partition-Gravimetric <sup>a</sup>	2 mg/L
Phosphate as Phosphorus	4500 -P D. Stannous Chloride <sup>a</sup>	<0.03 mg/L
Surfactants (MBAS)	5540 C. Anionic Surfactants as MBAS <sup>a</sup>	0.08 mg/L
Total Suspended Solids	2540 D. Gravimetric, Dried at 103-105°C <sup>a</sup>	2 mg/L

**Sample Description/Condition:** The sample is clear with few suspended solids and received in glass and plastic containers transported with ice.**References:**

- <sup>a</sup> Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017  
<sup>b</sup> US EPA 352.1. Standard Methods for the Examination of Water and Wastewater, 13th Edition.

Certified True and Correct by:

**Ranmar Marco A. Marco, RCh**  
Laboratory Analyst II  
PRC Lic. #0014151

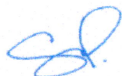
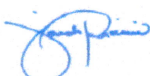
Approved by:

**Jennifer R. Maralit, RCh**  
General Manager  
PRC Lic. # 0007374

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Date Collected : **March 02, 2023**  
Date Received : **March 02, 2023**  
Date Analyzed : **March 02, 2023 - March 09, 2023**  
Date Reported : **March 13, 2023**  
Time Collected : **4:40 AM**  
Submitted By : **Customer****RESULTS OF ANALYSIS:**

Customer Sample ID : <b>Water - RK</b>		Lab Sample ID: <b>23-02122-004</b>
PARAMETER	METHOD	RESULT
Thermotolerant (Fecal) Coliform Count	Multiple Tube Fermentation Technique <sup>a</sup>	<1.8 MPN/100 mL

**Sample Description/Condition:** The sample is clear with few suspended solids and received in sterile bottle transported with ice.**References:** <sup>a</sup> Standard Methods for the Examination of Water and Wastewater 23rd ed. 2017**Certified True and Correct by:****Shyla May L. Quizon, RMT**  
**Laboratory Analyst II**  
PRC Lic. #0075710**Jonahdimary R. Alilio**  
**Laboratory Analyst III****Approved by:****Jennifer R. Maralit, RCh**  
**General Manager**  
PRC Lic. # 0007374

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Email: [optimal\\_lab@hotmail.com](mailto:optimal_lab@hotmail.com)  
Website: [www.optimalabinc.com.ph](http://www.optimalabinc.com.ph)Physico - Chemical Analysis for Foods, Feeds & Pharmaceutical Products  
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**CERTIFICATE OF ANALYSIS**Customer : APO REEF NATURAL PARK  
Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-02122  
Date Collected : March 02, 2023  
Date Received : March 02, 2023  
Date Analyzed : March 03, 2023 - March 09, 2023  
Date Reported : March 13, 2023  
Time Collected : 6:15 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

Customer Sample ID : Water - EW		Lab Sample ID: 23-02122-005
PARAMETER	METHOD	RESULT
Color (True Color)	2120 B. Visual Comparison <sup>a</sup>	<5 TCU
Nitrate as NO <sub>3</sub> -N	352.1 Colorimetric, Brucine <sup>b</sup>	0.09 mg/L
Oil and Grease	5520 B. Liquid-Liquid, Partition-Gravimetric <sup>a</sup>	2 mg/L
Phosphate as Phosphorus	4500 -P D. Stannous Chloride <sup>a</sup>	<0.03 mg/L
Surfactants (MBAS)	5540 C. Anionic Surfactants as MBAS <sup>a</sup>	0.09 mg/L
Total Suspended Solids	2540 D. Gravimetric, Dried at 103-105°C <sup>a</sup>	6 mg/L

**Sample Description/Condition:** The sample is clear with few suspended solids and received in glass and plastic containers transported with ice.**References:**

- <sup>a</sup> Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017  
<sup>b</sup> US EPA 352.1. Standard Methods for the Examination of Water and Wastewater, 13th Edition.

Certified True and Correct by:

**Ranmar Marco A. Marco, RCh**  
Laboratory Analyst II  
PRC Lic. #0014151

Approved by:

**Jennifer R. Maralit, RCh**  
General Manager  
PRC Lic. # 0007374

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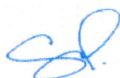
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**CERTIFICATE OF ANALYSIS**Customer : APO REEF NATURAL PARK  
Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-02122  
Date Collected : March 02, 2023  
Date Received : March 02, 2023  
Date Analyzed : March 02, 2023 - March 09, 2023  
Date Reported : March 13, 2023  
Time Collected: 6:15 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

Customer Sample ID : Water - EW		Lab Sample ID: 23-02122-005
PARAMETER	METHOD	RESULT
Thermotolerant (Fecal) Coliform Count	Multiple Tube Fermentation Technique <sup>a</sup>	4.5 MPN/100 mL

**Sample Description/Condition:** The sample is clear with few suspended solids and received in sterile bottle transported with ice.**References:** <sup>a</sup> Standard Methods for the Examination of Water and Wastewater 23rd ed. 2017**Certified True and Correct by:**Shyla May L. Quizon, RMT  
Laboratory Analyst II  
PRC Lic. #0075710Jonahdimary R. Alilio  
Laboratory Analyst III**Approved by:**Jennifer R. Maralit, RCh  
General Manager  
PRC Lic. # 0007374

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**CERTIFICATE OF ANALYSIS**Customer : APO REEF NATURAL PARK  
Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-02122  
Date Collected : March 02, 2023  
Date Received : March 02, 2023  
Date Analyzed : March 03, 2023 - March 09, 2023  
Date Reported : March 13, 2023  
Time Collected : 7:00 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

Customer Sample ID : Water - SA1		Lab Sample ID: 23-02122-006
PARAMETER	METHOD	RESULT
Color (True Color)	2120 B. Visual Comparison <sup>a</sup>	<5 TCU
Nitrate as NO <sub>3</sub> -N	352.1 Colorimetric, Brucine <sup>b</sup>	<0.06 mg/L
Oil and Grease	5520 B. Liquid-Liquid, Partition-Gravimetric <sup>a</sup>	3 mg/L
Phosphate as Phosphorus	4500 -P D. Stannous Chloride <sup>a</sup>	<0.03 mg/L
Surfactants (MBAS)	5540 C. Anionic Surfactants as MBAS <sup>a</sup>	0.1 mg/L
Total Suspended Solids	2540 D. Gravimetric, Dried at 103-105°C <sup>a</sup>	6 mg/L

**Sample Description/Condition:** The sample is clear with few suspended solids and received in glass and plastic containers transported with ice.**References:**

- <sup>a</sup> Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017  
<sup>b</sup> US EPA 352.1. Standard Methods for the Examination of Water and Wastewater, 13th Edition.

**Certified True and Correct by:****Ranmar Marco A. Marco, RCh**  
Laboratory Analyst II  
PRC Lic. #0014151**Approved by:****Jennifer R. Maralit, RCh**  
General Manager  
PRC Lic. # 0007374

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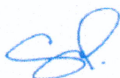
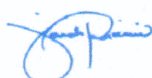
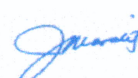
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**CERTIFICATE OF ANALYSIS**Customer : APO REEF NATURAL PARK  
Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-02122  
Date Collected : March 02, 2023  
Date Received : March 02, 2023  
Date Analyzed : March 02, 2023 - March 09, 2023  
Date Reported : March 13, 2023  
Time Collected : 7:00 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

Customer Sample ID : Water - SA1		Lab Sample ID: 23-02122-006
PARAMETER	METHOD	RESULT
Thermotolerant (Fecal) Coliform Count	Multiple Tube Fermentation Technique <sup>a</sup>	<1.8 MPN/100 mL

**Sample Description/Condition:** The sample is clear with few suspended solids and received in sterile bottle transported with ice.**References:** <sup>a</sup> Standard Methods for the Examination of Water and Wastewater 23rd ed. 2017**Certified True and Correct by:**Shyla May L. Quizon, RMT  
Laboratory Analyst II  
PRC Lic. #0075710Jonahdimary R. Alilio  
Laboratory Analyst III**Approved by:**Jennifer R. Maralit, RCh  
General Manager  
PRC Lic. # 0007374

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**CERTIFICATE OF ANALYSIS**Customer : **APO REEF NATURAL PARK**  
Address : **Brgy. Sto. Niño, Sablayan, Occidental Mindoro**Work Order : **23-02122**  
Date Collected : **March 02, 2023**  
Date Received : **March 02, 2023**  
Date Analyzed : **March 03, 2023 - March 09, 2023**  
Date Reported : **March 13, 2023**  
Time Collected : **7:20 AM**  
Submitted By : **Customer****RESULTS OF ANALYSIS:**

Customer Sample ID : <b>Water - SA2</b>		Lab Sample ID: <b>23-02122-007</b>
PARAMETER	METHOD	RESULT
Color (True Color)	2120 B. Visual Comparison <sup>a</sup>	<5 TCU
Nitrate as NO <sub>3</sub> -N	352.1 Colorimetric, Brucine <sup>b</sup>	<0.06 mg/L
Oil and Grease	5520 B. Liquid-Liquid, Partition-Gravimetric <sup>a</sup>	3 mg/L
Phosphate as Phosphorus	4500 -P D. Stannous Chloride <sup>a</sup>	<0.03 mg/L
Surfactants (MBAS)	5540 C. Anionic Surfactants as MBAS <sup>a</sup>	0.13 mg/L
Total Suspended Solids	2540 D. Gravimetric, Dried at 103-105°C <sup>a</sup>	9 mg/L

**Sample Description/Condition:** The sample is clear with few suspended solids and received in glass and plastic containers transported with ice.**References:**

- <sup>a</sup> Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017  
<sup>b</sup> US EPA 352.1. Standard Methods for the Examination of Water and Wastewater, 13th Edition.

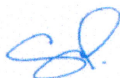

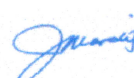
**Certified True and Correct by:****Ranmar Marco A. Marco, RCh**  
**Laboratory Analyst II**  
PRC Lic. #0014151**Approved by:****Jennifer R. Maralit, RCh**  
**General Manager**  
PRC Lic. # 0007374

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**CERTIFICATE OF ANALYSIS**Customer : **APO REEF NATURAL PARK**  
Address : **Brgy. Sto. Niño, Sablayan, Occidental Mindoro**Work Order : **23-02122**  
Date Collected : **March 02, 2023**  
Date Received : **March 02, 2023**  
Date Analyzed : **March 02, 2023 - March 09, 2023**  
Date Reported : **March 13, 2023**  
Time Collected : **7:20 AM**  
Submitted By : **Customer****RESULTS OF ANALYSIS:**

Customer Sample ID : <b>Water - SA2</b>		Lab Sample ID: <b>23-02122-007</b>
PARAMETER	METHOD	RESULT
Thermotolerant (Fecal) Coliform Count	Multiple Tube Fermentation Technique <sup>a</sup>	2.0 MPN/100 mL

**Sample Description/Condition:** The sample is clear with few suspended solids and received in sterile bottle transported with ice.**References:** <sup>a</sup> Standard Methods for the Examination of Water and Wastewater 23rd ed. 2017**Certified True and Correct by:****Shyla May L. Quizon, RMT**  
**Laboratory Analyst II**  
PRC Lic. #0075710**Jonahdimary R. Alilio**  
**Laboratory Analyst III****Approved by:****Jennifer R. Maralit, RCh**  
**General Manager**  
PRC Lic. # 0007374

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Page 1 of 1

**CERTIFICATE OF ANALYSIS**Customer : APO REEF NATURAL PARK  
Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-02122  
Date Collected : March 02, 2023  
Date Received : March 02, 2023  
Date Analyzed : March 03, 2023 - March 09, 2023  
Date Reported : March 13, 2023  
Time Collected : 6:35 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

Customer Sample ID : Water - SC		Lab Sample ID: 23-02122-008
PARAMETER	METHOD	RESULT
Color (True Color)	2120 B. Visual Comparison <sup>a</sup>	<5 TCU
Nitrate as NO <sub>3</sub> -N	352.1 Colorimetric, Brucine <sup>b</sup>	<0.06 mg/L
Oil and Grease	5520 B. Liquid-Liquid, Partition-Gravimetric <sup>a</sup>	4 mg/L
Phosphate as Phosphorus	4500 -P D. Stannous Chloride <sup>a</sup>	<0.03 mg/L
Surfactants (MBAS)	5540 C. Anionic Surfactants as MBAS <sup>a</sup>	0.22 mg/L
Total Suspended Solids	2540 D. Gravimetric, Dried at 103-105°C <sup>a</sup>	13 mg/L

**Sample Description/Condition:** The sample is clear with few suspended solids and received in glass and plastic containers transported with ice.**References:**

- <sup>a</sup> Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017  
<sup>b</sup> US EPA 352.1. Standard Methods for the Examination of Water and Wastewater, 13th Edition.

**Certified True and Correct by:****Ranmar Marco A. Marco, RCh**  
Laboratory Analyst II  
PRC Lic. #0014151**Approved by:****Jennifer R. Maralit, RCh**  
General Manager  
PRC Lic. # 0007374

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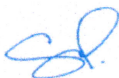
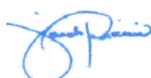
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**CERTIFICATE OF ANALYSIS**Customer : APO REEF NATURAL PARK  
Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-02122  
Date Collected : March 02, 2023  
Date Received : March 02, 2023  
Date Analyzed : March 02, 2023 - March 09, 2023  
Date Reported : March 13, 2023  
Time Collected : 6:35 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

Customer Sample ID : Water - SC		Lab Sample ID: 23-02122-008
PARAMETER	METHOD	RESULT
Thermotolerant (Fecal) Coliform Count	Multiple Tube Fermentation Technique <sup>a</sup>	<1.8 MPN/100 mL

**Sample Description/Condition:** The sample is clear with few suspended solids and received in sterile bottle transported with ice.**References:** <sup>a</sup> Standard Methods for the Examination of Water and Wastewater 23rd ed. 2017**Certified True and Correct by:**Shyla May L. Quizon, RMT  
Laboratory Analyst II  
PRC Lic. #0075710Jonahdimary R. Alilio  
Laboratory Analyst III**Approved by:**Jennifer R. Maralit, RCh  
General Manager  
PRC Lic. # 0007374

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**CERTIFICATE OF ANALYSIS**Customer : APO REEF NATURAL PARK  
Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-02122  
Date Collected : March 02, 2023  
Date Received : March 02, 2023  
Date Analyzed : March 03, 2023 - March 09, 2023  
Date Reported : March 13, 2023  
Time Collected : 4:20 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

Customer Sample ID : Water - TIEZA		Lab Sample ID: 23-02122-009
PARAMETER	METHOD	RESULT
Color (True Color)	2120 B. Visual Comparison <sup>a</sup>	5 TCU
Nitrate as NO <sub>3</sub> -N	352.1 Colorimetric, Brucine <sup>b</sup>	2.54 mg/L
Oil and Grease	5520 B. Liquid-Liquid, Partition-Gravimetric <sup>a</sup>	9 mg/L
Phosphate as Phosphorus	4500 -P D. Stannous Chloride <sup>a</sup>	0.13 mg/L
Surfactants (MBAS)	5540 C. Anionic Surfactants as MBAS <sup>a</sup>	0.19 mg/L
Total Suspended Solids	2540 D. Gravimetric, Dried at 103-105°C <sup>a</sup>	1 mg/L

**Sample Description/Condition:** The sample is clear with few suspended solids and received in glass and plastic containers transported with ice.**References:**

- <sup>a</sup> Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017  
<sup>b</sup> US EPA 352.1. Standard Methods for the Examination of Water and Wastewater, 13th Edition.

Certified True and Correct by:

**Ranmar Marco A. Marco, RCh**  
Laboratory Analyst II  
PRC Lic. #0014151

Approved by:

**Jennifer R. Maralit, RCh**  
General Manager  
PRC Lic. # 0007374

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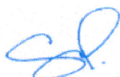
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**CERTIFICATE OF ANALYSIS**Customer : **APO REEF NATURAL PARK**  
Address : **Brgy. Sto. Niño, Sablayan, Occidental Mindoro**Work Order : **23-02122**  
Date Collected : **March 02, 2023**  
Date Received : **March 02, 2023**  
Date Analyzed : **March 02, 2023 - March 09, 2023**  
Date Reported : **March 13, 2023**  
Time Collected : **4:20 AM**  
Submitted By : **Customer****RESULTS OF ANALYSIS:**

Customer Sample ID : <b>Water - TIEZA</b>		Lab Sample ID: <b>23-02122-009</b>
PARAMETER	METHOD	RESULT
Thermotolerant (Fecal) Coliform Count	Multiple Tube Fermentation Technique <sup>a</sup>	<1.8 MPN/100 mL

**Sample Description/Condition:** The sample is clear with few suspended solids and received in sterile bottle transported with ice.**References:** <sup>a</sup> Standard Methods for the Examination of Water and Wastewater 23rd ed. 2017**Certified True and Correct by:****Shyla May L. Quizon, RMT**  
**Laboratory Analyst II**  
PRC Lic. #0075710**Jonahdimary R. Alilio**  
**Laboratory Analyst III****Approved by:****Jennifer R. Maralit, RCh**  
**General Manager**  
PRC Lic. # 0007374

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## Appendix G. Results of the laboratory analyses of samples collected on September 7, 2023.



Department of Environment and Natural Resources • DA - Bureau of Animal Industry • Department of Health • Food and Drug Administration



F-PR-07-08/02  
Iss.03 Rev. 02  
Effectivity: September 22, 2022

### CERTIFICATE OF ANALYSIS

Customer : **APO REEF NATURAL PARK**  
Address : **Brgy. Sto. Niño, Sablayan, Occidental Mindoro**

Work Order : **23-08214**  
Date Collected : **September 07, 2023**  
Date Received : **September 07, 2023**  
Date Analyzed : **September 07, 2023 - September 14, 2023**  
Date Reported : **September 14, 2023**  
Time Collected : **4:45 AM**  
Submitted By : **Customer**

#### RESULTS OF ANALYSIS:

Customer Sample ID : <b>Marine Water - GW</b>		Lab Sample ID: <b>23-08214-001</b>
PARAMETER	METHOD	RESULT
Color (True Color)	2120 B. Visual Comparison <sup>a</sup>	5 TCU
Nitrate as NO <sub>3</sub> -N	352.1 Colorimetric, Brucine <sup>b</sup>	0.7 mg/L
Oil and Grease	5520 B. Liquid-Liquid, Partition-Gravimetric <sup>a</sup>	3 mg/L
Phosphate as Phosphorus	4500 -P D. Stannous Chloride <sup>a</sup>	<0.01 mg/L
Surfactants (MBAS)	5540 C. Anionic Surfactants as MBAS <sup>a</sup>	0.19 mg/L
Total Suspended Solids	2540 D. Gravimetric, Dried at 103-105°C <sup>a</sup>	2 mg/L

**Sample Description/Condition:** The sample is clear and received in glass and plastic containers transported with ice.

#### References:

- <sup>a</sup> Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017
- <sup>b</sup> US EPA 352.1. Standard Methods for the Examination of Water and Wastewater, 13th Edition.

Certified True and Correct by:

**Ranmar Marco A. Marco, RCh**  
**Laboratory Supervisor**  
PRC Lic. #0014151

Approved by:

**Jennifer R. Maralit, RCh**  
**General Manager**  
PRC Lic. # 0007374

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Final\_09142023\_1147\_23-08214\_23-08214-001





**CERTIFICATE OF ANALYSIS**Customer : APO REEF NATURAL PARK  
Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-08214  
Date Collected : September 07, 2023  
Date Received : September 07, 2023  
Date Analyzed : September 07, 2023 - September 14, 2023  
Date Reported : September 14, 2023  
Time Collected : 4:45 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

Customer Sample ID : Marine Water - GW		Lab Sample ID: 23-08214-001
PARAMETER	METHOD	RESULT
Thermotolerant (Fecal) Coliform Count	Multiple Tube Fermentation Technique <sup>a</sup>	7.8 MPN/100 mL

**Sample Description/Condition:** The sample is clear and received in sterile bottle transported with ice.**References:** <sup>a</sup> Standard Methods for the Examination of Water and Wastewater 23rd ed. 2017

Certified True and Correct by:

Shyla May L. Quizon, RMT  
Laboratory Analyst II  
PRC Lic. #0075710Jonahdimary R. Alilio  
Laboratory Analyst III

Approved by:

Jennifer R. Maralit, RCh  
General Manager  
PRC Lic. # 0007374

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Firm\_09142023\_1146\_23-08214\_23-08214-001

Page 1 of 1

**CERTIFICATE OF ANALYSIS**Customer : APO REEF NATURAL PARK  
Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-08214  
Date Collected : September 07, 2023  
Date Received : September 07, 2023  
Date Analyzed : September 07, 2023 - September 14, 2023  
Date Reported : September 14, 2023  
Time Collected : 5:30 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

Customer Sample ID : Marine Water - PG		Lab Sample ID: 23-08214-002
PARAMETER	METHOD	RESULT
Color (True Color)	2120 B. Visual Comparison <sup>a</sup>	<5 TCU
Nitrate as NO <sub>3</sub> -N	352.1 Colorimetric, Brucine <sup>b</sup>	0.11 mg/L
Oil and Grease	5520 B. Liquid-Liquid, Partition-Gravimetric <sup>a</sup>	3 mg/L
Phosphate as Phosphorus	4500 -P D. Stannous Chloride <sup>a</sup>	<0.01 mg/L
Surfactants (MBAS)	5540 C. Anionic Surfactants as MBAS <sup>a</sup>	0.25 mg/L
Total Suspended Solids	2540 D. Gravimetric, Dried at 103-105°C <sup>a</sup>	21 mg/L

**Sample Description/Condition:** The sample is clear and received in glass and plastic containers transported with ice.**References:**

- <sup>a</sup> Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017  
<sup>b</sup> US EPA 352.1. Standard Methods for the Examination of Water and Wastewater, 13th Edition.

**Certified True and Correct by:****Ranmar Marco A. Marco, RCh**  
Laboratory Supervisor  
PRC Lic. #0014151**Approved by:****Jennifer R. Maralit, RCh**  
General Manager  
PRC Lic. # 0007374

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Final\_09142023\_1147\_23-08214\_23-08214-002



**CERTIFICATE OF ANALYSIS**Customer : APO REEF NATURAL PARK  
Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-08214  
Date Collected : September 07, 2023  
Date Received : September 07, 2023  
Date Analyzed : September 07, 2023 - September 14, 2023  
Date Reported : September 14, 2023  
Time Collected : 5:30 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

Customer Sample ID : Marine Water - PG		Lab Sample ID: 23-08214-002
PARAMETER	METHOD	RESULT
Thermotolerant (Fecal) Coliform Count	Multiple Tube Fermentation Technique <sup>a</sup>	< 1.8 MPN/100 mL

**Sample Description/Condition:** The sample is clear and received in sterile bottle transported with ice.**References:** <sup>a</sup> Standard Methods for the Examination of Water and Wastewater 23rd ed. 2017**Certified True and Correct by:**Shyla May L. Quizon, RMT  
Laboratory Analyst II  
PRC Lic. #0075710Jonahdimary R. Alilio  
Laboratory Analyst III**Approved by:**Jennifer R. Maralit, RCh  
General Manager  
PRC Lic. # 0007374

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Ambient Air / Stationary Source Emission Sampling & Analysis

Final\_09142023\_1147\_23-08214\_23-08214-002

**CERTIFICATE OF ANALYSIS**Customer : APO REEF NATURAL PARK  
Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-08214  
Date Collected : September 07, 2023  
Date Received : September 07, 2023  
Date Analyzed : September 07, 2023 - September 14, 2023  
Date Reported : September 14, 2023  
Time Collected : 5:05 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

Customer Sample ID : Marine Water - LH		Lab Sample ID: 23-08214-003
PARAMETER	METHOD	RESULT
Color (True Color)	2120 B. Visual Comparison <sup>a</sup>	<5 TCU
Nitrate as NO <sub>3</sub> -N	352.1 Colorimetric, Brucine <sup>b</sup>	0.34 mg/L
Oil and Grease	5520 B. Liquid-Liquid, Partition-Gravimetric <sup>a</sup>	3 mg/L
Phosphate as Phosphorus	4500 -P D. Stannous Chloride <sup>a</sup>	<0.01 mg/L
Surfactants (MBAS)	5540 C. Anionic Surfactants as MBAS <sup>a</sup>	0.23 mg/L
Total Suspended Solids	2540 D. Gravimetric, Dried at 103-105°C <sup>a</sup>	17 mg/L

**Sample Description/Condition:** The sample is clear and received in glass and plastic containers transported with ice.**References:**

- <sup>a</sup> Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017  
<sup>b</sup> US EPA 352.1. Standard Methods for the Examination of Water and Wastewater, 13th Edition.

**Certified True and Correct by:****Ranmar Marco A. Marco, RCh**  
Laboratory Supervisor  
PRC Lic. #0014151**Approved by:****Jennifer R. Maralit, RCh**  
General Manager  
PRC Lic. # 0007374

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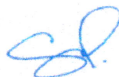
Final\_09142023\_1147\_23-08214\_23-08214-003

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**CERTIFICATE OF ANALYSIS**Customer : **APO REEF NATURAL PARK**  
Address : **Brgy. Sto. Niño, Sablayan, Occidental Mindoro**Work Order : **23-08214**  
Date Collected : **September 07, 2023**  
Date Received : **September 07, 2023**  
Date Analyzed : **September 07, 2023 - September 14, 2023**  
Date Reported : **September 14, 2023**  
Time Collected : **5:05 AM**  
Submitted By : **Customer****RESULTS OF ANALYSIS:**

Customer Sample ID : <b>Marine Water - LH</b>		Lab Sample ID: <b>23-08214-003</b>
PARAMETER	METHOD	RESULT
Thermotolerant (Fecal) Coliform Count	Multiple Tube Fermentation Technique <sup>a</sup>	< 1.8 MPN/100 mL

**Sample Description/Condition:** The sample is clear and received in sterile bottle transported with ice.**References:** <sup>a</sup> Standard Methods for the Examination of Water and Wastewater 23rd ed. 2017**Certified True and Correct by:****Shyla May L. Quizon, RMT**  
Laboratory Analyst II  
PRC Lic. #0075710**Jonahdimary R. Alilio**  
Laboratory Analyst III**Approved by:****Jennifer R. Maralit, RCh**  
General Manager  
PRC Lic. # 0007374

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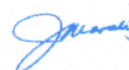
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**CERTIFICATE OF ANALYSIS**Customer : APO REEF NATURAL PARK  
Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-08214  
Date Collected : September 07, 2023  
Date Received : September 07, 2023  
Date Analyzed : September 07, 2023 - September 14, 2023  
Date Reported : September 14, 2023  
Time Collected : 5:15 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

Customer Sample ID : Marine Water - RK		Lab Sample ID: 23-08214-004
PARAMETER	METHOD	RESULT
Color (True Color)	2120 B. Visual Comparison <sup>a</sup>	<5 TCU
Nitrate as NO <sub>3</sub> -N	352.1 Colorimetric, Brucine <sup>b</sup>	0.16 mg/L
Oil and Grease	5520 B. Liquid-Liquid, Partition-Gravimetric <sup>a</sup>	3 mg/L
Phosphate as Phosphorus	4500 -P D. Stannous Chloride <sup>a</sup>	<0.01 mg/L
Surfactants (MBAS)	5540 C. Anionic Surfactants as MBAS <sup>a</sup>	0.17 mg/L
Total Suspended Solids	2540 D. Gravimetric, Dried at 103-105°C <sup>a</sup>	14 mg/L

**Sample Description/Condition:** The sample is clear and received in glass and plastic containers transported with ice.**References:**

- <sup>a</sup> Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017  
<sup>b</sup> US EPA 352.1. Standard Methods for the Examination of Water and Wastewater, 13th Edition.

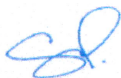
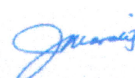
**Certified True and Correct by:****Ranmar Marco A. Marco, RCh**  
Laboratory Supervisor  
PRC Lic. #0014151**Approved by:****Jennifer R. Maralit, RCh**  
General Manager  
PRC Lic. # 0007374

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**CERTIFICATE OF ANALYSIS**Customer : APO REEF NATURAL PARK  
Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-08214  
Date Collected : September 07, 2023  
Date Received : September 07, 2023  
Date Analyzed : September 07, 2023 - September 14, 2023  
Date Reported : September 14, 2023  
Time Collected : 5:15 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

Customer Sample ID : Marine Water - RK		Lab Sample ID: 23-08214-004
PARAMETER	METHOD	RESULT
Thermotolerant (Fecal) Coliform Count	Multiple Tube Fermentation Technique <sup>a</sup>	< 1.8 MPN/100 mL

**Sample Description/Condition:** The sample is clear and received in sterile bottle transported with ice.**References:** <sup>a</sup> Standard Methods for the Examination of Water and Wastewater 23rd ed. 2017**Certified True and Correct by:**Shyla May L. Quizon, RMT  
Laboratory Analyst II  
PRC Lic. #0075710Jonahdimary R. Alilio  
Laboratory Analyst III**Approved by:**Jennifer R. Maralit, RCh  
General Manager  
PRC Lic. # 0007374

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Page 1 of 1

**CERTIFICATE OF ANALYSIS**Customer : APO REEF NATURAL PARK  
Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-08214  
Date Collected : September 07, 2023  
Date Received : September 07, 2023  
Date Analyzed : September 07, 2023 - September 14, 2023  
Date Reported : September 14, 2023  
Time Collected : 6:00 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

Customer Sample ID : Marine Water - EW		Lab Sample ID: 23-08214-005
PARAMETER	METHOD	RESULT
Color (True Color)	2120 B. Visual Comparison <sup>a</sup>	<5 TCU
Nitrate as NO <sub>3</sub> -N	352.1 Colorimetric, Brucine <sup>b</sup>	0.17 mg/L
Oil and Grease	5520 B. Liquid-Liquid, Partition-Gravimetric <sup>a</sup>	3 mg/L
Phosphate as Phosphorus	4500 -P D. Stannous Chloride <sup>a</sup>	<0.01 mg/L
Surfactants (MBAS)	5540 C. Anionic Surfactants as MBAS <sup>a</sup>	0.27 mg/L
Total Suspended Solids	2540 D. Gravimetric, Dried at 103-105°C <sup>a</sup>	6 mg/L

**Sample Description/Condition:** The sample is clear and received in glass and plastic containers transported with ice.**References:**

- <sup>a</sup> Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017  
<sup>b</sup> US EPA 352.1. Standard Methods for the Examination of Water and Wastewater, 13th Edition.

**Certified True and Correct by:**Ranmar Marco A. Marco, RCh  
Laboratory Supervisor  
PRC Lic. #0014151**Approved by:**Jennifer R. Maralit, RCh  
General Manager  
PRC Lic. # 0007374

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## CERTIFICATE OF ANALYSIS

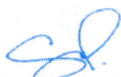
 Customer : **APO REEF NATURAL PARK**  
 Address : **Brgy. Sto. Niño, Sablayan, Occidental Mindoro**

 Work Order : **23-08214**  
 Date Collected : **September 07, 2023**  
 Date Received : **September 07, 2023**  
 Date Analyzed : **September 07, 2023 - September 14, 2023**  
 Date Reported : **September 14, 2023**  
 Time Collected : **6:00 AM**  
 Submitted By : **Customer**
**RESULTS OF ANALYSIS:**

Customer Sample ID : <b>Marine Water - EW</b>		Lab Sample ID: <b>23-08214-005</b>
PARAMETER	METHOD	RESULT
Thermotolerant (Fecal) Coliform Count	Multiple Tube Fermentation Technique <sup>a</sup>	78 MPN/100 mL

**Sample Description/Condition:** The sample is clear and received in sterile bottle transported with ice.

**References:** <sup>a</sup> Standard Methods for the Examination of Water and Wastewater 23rd ed. 2017

**Certified True and Correct by:**

**Shyla May L. Quizon, RMT**  
 Laboratory Analyst II  
 PRC Lic. #0075710


**Jonahdimary R. Alilio**  
 Laboratory Analyst III

**Approved by:**

**Jennifer R. Maralit, RCh**  
 General Manager  
 PRC Lic. # 0007374

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**CERTIFICATE OF ANALYSIS**Customer : APO REEF NATURAL PARK  
Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-08214  
Date Collected : September 07, 2023  
Date Received : September 07, 2023  
Date Analyzed : September 07, 2023 - September 14, 2023  
Date Reported : September 14, 2023  
Time Collected : 6:30 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

Customer Sample ID : Marine Water - SA1		Lab Sample ID: 23-08214-006
PARAMETER	METHOD	RESULT
Color (True Color)	2120 B. Visual Comparison <sup>a</sup>	<5 TCU
Nitrate as NO <sub>3</sub> -N	352.1 Colorimetric, Brucine <sup>b</sup>	<0.06 mg/L
Oil and Grease	5520 B. Liquid-Liquid, Partition-Gravimetric <sup>a</sup>	3 mg/L
Phosphate as Phosphorus	4500 -P D. Stannous Chloride <sup>a</sup>	<0.01 mg/L
Surfactants (MBAS)	5540 C. Anionic Surfactants as MBAS <sup>a</sup>	0.23 mg/L
Total Suspended Solids	2540 D. Gravimetric, Dried at 103-105°C <sup>a</sup>	12 mg/L

**Sample Description/Condition:** The sample is clear and received in glass and plastic containers transported with ice.**References:**

- <sup>a</sup> Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017  
<sup>b</sup> US EPA 352.1. Standard Methods for the Examination of Water and Wastewater, 13th Edition.

Certified True and Correct by:

**Ranmar Marco A. Marco, RCh**  
Laboratory Supervisor  
PRC Lic. #0014151

Approved by:

**Jennifer R. Maralit, RCh**  
General Manager  
PRC Lic. # 0007374

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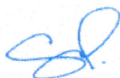
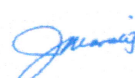
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**CERTIFICATE OF ANALYSIS**Customer : **APO REEF NATURAL PARK**  
Address : **Brgy. Sto. Niño, Sablayan, Occidental Mindoro**Work Order : **23-08214**  
Date Collected : **September 07, 2023**  
Date Received : **September 07, 2023**  
Date Analyzed : **September 07, 2023 - September 14, 2023**  
Date Reported : **September 14, 2023**  
Time Collected : **6:30 AM**  
Submitted By : **Customer****RESULTS OF ANALYSIS:**

Customer Sample ID : <b>Marine Water - SA1</b>		Lab Sample ID: <b>23-08214-006</b>
PARAMETER	METHOD	RESULT
Thermotolerant (Fecal) Coliform Count	Multiple Tube Fermentation Technique <sup>a</sup>	< 1.8 MPN/100 mL

**Sample Description/Condition:** The sample is clear and received in sterile bottle transported with ice.**References:** <sup>a</sup> Standard Methods for the Examination of Water and Wastewater 23rd ed. 2017**Certified True and Correct by:****Shyla May L. Quizon, RMT**  
**Laboratory Analyst II**  
PRC Lic. #0075710**Jonahdimary R. Alilio**  
**Laboratory Analyst III****Approved by:****Jennifer R. Maralit, RCh**  
**General Manager**  
PRC Lic. # 0007374

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Website: [www.optimalabinc.com.ph](http://www.optimalabinc.com.ph)Physico - Chemical Analysis for Foods, Feeds & Pharmaceutical Products  
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**CERTIFICATE OF ANALYSIS**Customer : APO REEF NATURAL PARK  
Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-08214  
Date Collected : September 07, 2023  
Date Received : September 07, 2023  
Date Analyzed : September 07, 2023 - September 14, 2023  
Date Reported : September 14, 2023  
Time Collected : 6:45 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

Customer Sample ID : Marine Water - SA2		Lab Sample ID: 23-08214-007
PARAMETER	METHOD	RESULT
Color (True Color)	2120 B. Visual Comparison <sup>a</sup>	<5 TCU
Nitrate as NO <sub>3</sub> -N	352.1 Colorimetric, Brucine <sup>b</sup>	0.13 mg/L
Oil and Grease	5520 B. Liquid-Liquid, Partition-Gravimetric <sup>a</sup>	2 mg/L
Phosphate as Phosphorus	4500 -P D. Stannous Chloride <sup>a</sup>	<0.01 mg/L
Surfactants (MBAS)	5540 C. Anionic Surfactants as MBAS <sup>a</sup>	0.19 mg/L
Total Suspended Solids	2540 D. Gravimetric, Dried at 103-105°C <sup>a</sup>	14 mg/L

**Sample Description/Condition:** The sample is clear and received in glass and plastic containers transported with ice.**References:**

- <sup>a</sup> Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017  
<sup>b</sup> US EPA 352.1. Standard Methods for the Examination of Water and Wastewater, 13th Edition.

**Certified True and Correct by:****Ranmar Marco A. Marco, RCh**  
Laboratory Supervisor  
PRC Lic. #0014151**Approved by:****Jennifer R. Maralit, RCh**  
General Manager  
PRC Lic. # 0007374

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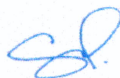
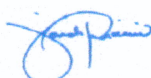
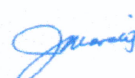
Final\_09142023\_1147\_23-08214\_23-08214-007

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**CERTIFICATE OF ANALYSIS**Customer : **APO REEF NATURAL PARK**  
Address : **Brgy. Sto. Niño, Sablayan, Occidental Mindoro**Work Order : **23-08214**  
Date Collected : **September 07, 2023**  
Date Received : **September 07, 2023**  
Date Analyzed : **September 07, 2023 - September 14, 2023**  
Date Reported : **September 14, 2023**  
Time Collected : **6:45 AM**  
Submitted By : **Customer****RESULTS OF ANALYSIS:**

Customer Sample ID : <b>Marine Water - SA2</b>		Lab Sample ID: <b>23-08214-007</b>
PARAMETER	METHOD	RESULT
Thermotolerant (Fecal) Coliform Count	Multiple Tube Fermentation Technique <sup>a</sup>	4.0 MPN/100 mL

**Sample Description/Condition:** The sample is clear and received in sterile bottle transported with ice.**References:** <sup>a</sup> Standard Methods for the Examination of Water and Wastewater 23rd ed. 2017**Certified True and Correct by:****Shyla May L. Quizon, RMT**  
**Laboratory Analyst II**  
PRC Lic. #0075710**Jonahdimary R. Alilio**  
**Laboratory Analyst III****Approved by:****Jennifer R. Maralit, RCh**  
**General Manager**  
PRC Lic. # 0007374

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Email: [optimal\\_lab@hotmail.com](mailto:optimal_lab@hotmail.com)  
Website: [www.optimalabinc.com.ph](http://www.optimalabinc.com.ph)Physico - Chemical Analysis for Foods, Feeds & Pharmaceutical Products  
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**CERTIFICATE OF ANALYSIS**Customer : APO REEF NATURAL PARK  
Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-08214  
Date Collected : September 07, 2023  
Date Received : September 07, 2023  
Date Analyzed : September 07, 2023 - September 14, 2023  
Date Reported : September 14, 2023  
Time Collected : 6:15 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

Customer Sample ID : Marine Water - SC		Lab Sample ID: 23-08214-008
PARAMETER	METHOD	RESULT
Color (True Color)	2120 B. Visual Comparison <sup>a</sup>	<5 TCU
Nitrate as NO <sub>3</sub> -N	352.1 Colorimetric, Brucine <sup>b</sup>	0.12 mg/L
Oil and Grease	5520 B. Liquid-Liquid, Partition-Gravimetric <sup>a</sup>	3 mg/L
Phosphate as Phosphorus	4500 -P D. Stannous Chloride <sup>a</sup>	<0.01 mg/L
Surfactants (MBAS)	5540 C. Anionic Surfactants as MBAS <sup>a</sup>	0.21 mg/L
Total Suspended Solids	2540 D. Gravimetric, Dried at 103-105°C <sup>a</sup>	12 mg/L

**Sample Description/Condition:** The sample is clear and received in glass and plastic containers transported with ice.**References:**

- <sup>a</sup> Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017  
<sup>b</sup> US EPA 352.1. Standard Methods for the Examination of Water and Wastewater, 13th Edition.

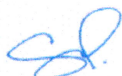
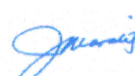
**Certified True and Correct by:****Ranmar Marco A. Marco, RCh**  
**Laboratory Supervisor**  
PRC Lic. #0014151**Approved by:****Jennifer R. Maralit, RCh**  
**General Manager**  
PRC Lic. # 0007374

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**CERTIFICATE OF ANALYSIS**Customer : APO REEF NATURAL PARK  
Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-08214  
Date Collected : September 07, 2023  
Date Received : September 07, 2023  
Date Analyzed : September 07, 2023 - September 14, 2023  
Date Reported : September 14, 2023  
Time Collected : 6:15 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

Customer Sample ID : Marine Water - SC		Lab Sample ID: 23-08214-008
PARAMETER	METHOD	RESULT
Thermotolerant (Fecal) Coliform Count	Multiple Tube Fermentation Technique <sup>a</sup>	< 1.8 MPN/100 mL

**Sample Description/Condition:** The sample is clear and received in sterile bottle transported with ice.**References:** <sup>a</sup> Standard Methods for the Examination of Water and Wastewater 23rd ed. 2017**Certified True and Correct by:**Shyla May L. Quizon, RMT  
Laboratory Analyst II  
PRC Lic. #0075710Jonahdimary R. Alilio  
Laboratory Analyst III**Approved by:**Jennifer R. Maralit, RCh  
General Manager  
PRC Lic. # 0007374

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**CERTIFICATE OF ANALYSIS**Customer : APO REEF NATURAL PARK  
Address : Brgy. Sto. Niño, Sablayan, Occidental MindoroWork Order : 23-08214  
Date Collected : September 07, 2023  
Date Received : September 07, 2023  
Date Analyzed : September 07, 2023 - September 14, 2023  
Date Reported : September 14, 2023  
Time Collected : 5:00 AM  
Submitted By : Customer**RESULTS OF ANALYSIS:**

Customer Sample ID : Marine Water - TIEZA		Lab Sample ID: 23-08214-009
PARAMETER	METHOD	RESULT
Color (True Color)	2120 B. Visual Comparison <sup>a</sup>	10 TCU
Nitrate as NO <sub>3</sub> -N	352.1 Colorimetric, Brucine <sup>b</sup>	1.96 mg/L
Oil and Grease	5520 B. Liquid-Liquid, Partition-Gravimetric <sup>a</sup>	3 mg/L
Phosphate as Phosphorus	4500 -P D. Stannous Chloride <sup>a</sup>	0.12 mg/L
Surfactants (MBAS)	5540 C. Anionic Surfactants as MBAS <sup>a</sup>	0.19 mg/L
Total Suspended Solids	2540 D. Gravimetric, Dried at 103-105°C <sup>a</sup>	7 mg/L

**Sample Description/Condition:** The sample is clear and received in glass and plastic containers transported with ice.**References:**  
<sup>a</sup> Standard Methods for the Examination of Water and Wastewater, 23rd Edition, 2017  
<sup>b</sup> US EPA 352.1. Standard Methods for the Examination of Water and Wastewater, 13th Edition.**Certified True and Correct by:****Ranmar Marco A. Marco, RCh**  
**Laboratory Supervisor**  
PRC Lic. #0014151**Approved by:****Jennifer R. Maralit, RCh**  
**General Manager**  
PRC Lic. # 0007374

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**CERTIFICATE OF ANALYSIS**Customer : **APO REEF NATURAL PARK**  
Address : **Brgy. Sto. Niño, Sablayan, Occidental Mindoro**Work Order : **23-08214**  
Date Collected : **September 07, 2023**  
Date Received : **September 07, 2023**  
Date Analyzed : **September 07, 2023 - September 14, 2023**  
Date Reported : **September 14, 2023**  
Time Collected : **5:00 AM**  
Submitted By : **Customer****RESULTS OF ANALYSIS:**

Customer Sample ID : <b>Marine Water - TIEZA</b>		Lab Sample ID: <b>23-08214-009</b>
PARAMETER	METHOD	RESULT
Thermotolerant (Fecal) Coliform Count	Multiple Tube Fermentation Technique <sup>a</sup>	1,300 MPN/100 mL

**Sample Description/Condition:** The sample is clear and received in sterile bottle transported with ice.**References:** <sup>a</sup> Standard Methods for the Examination of Water and Wastewater 23rd ed. 2017**Certified True and Correct by:****Shyla May L. Quizon, RMT**  
*Laboratory Analyst II*  
PRC Lic. #0075710**Jonahdimary R. Alilio**  
*Laboratory Analyst III***Approved by:****Jennifer R. Maralit, RCh**  
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