




27.12.2019	Particulate matter ug/m3		World Bank Limit ug/m3
HRSG 11	PM 2.5	10	25
	PM 10	26	50
Mainstack	Temp	24.84°C	
		64.8%RH	



30.12.2019	Particulate matter ug/m3		World Bank Limit ug/m3
HRSG 12	PM 2.5	6	25
	PM 10	20	50
Mainstack	Temp	28.06°C	
		47.0%RH	



30.12.2019	Particulate matter ug/m3		World Bank Limit ug/m3
HRSG 11	PM 2.5	8	25
	PM 10	22	50
Mainstack	Temp	29.89°C	
		55.3%RH	



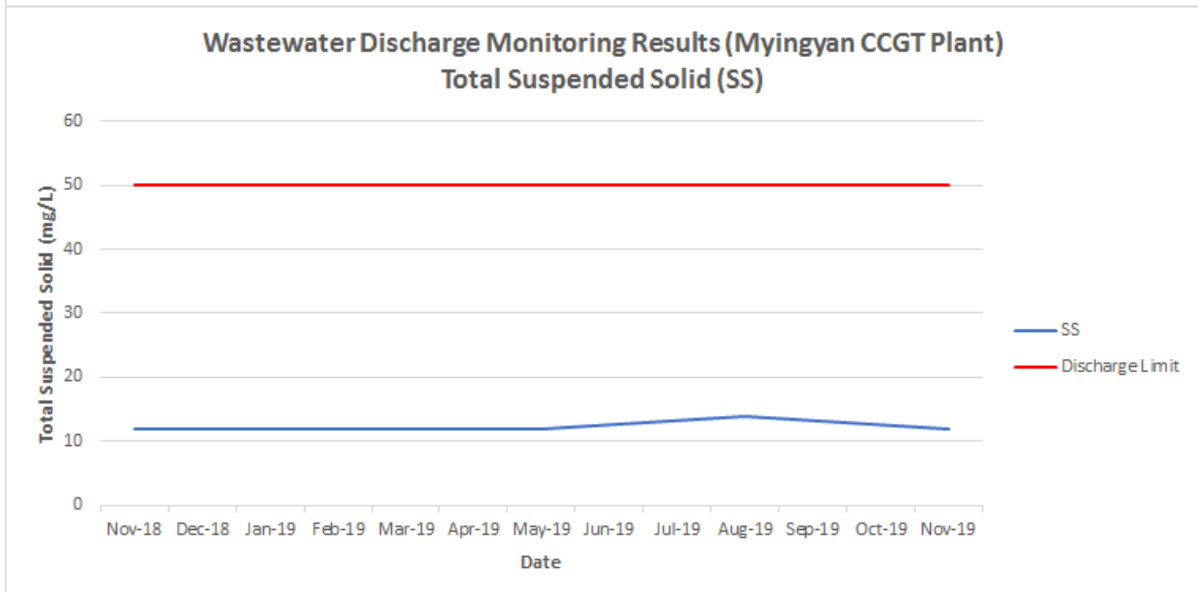
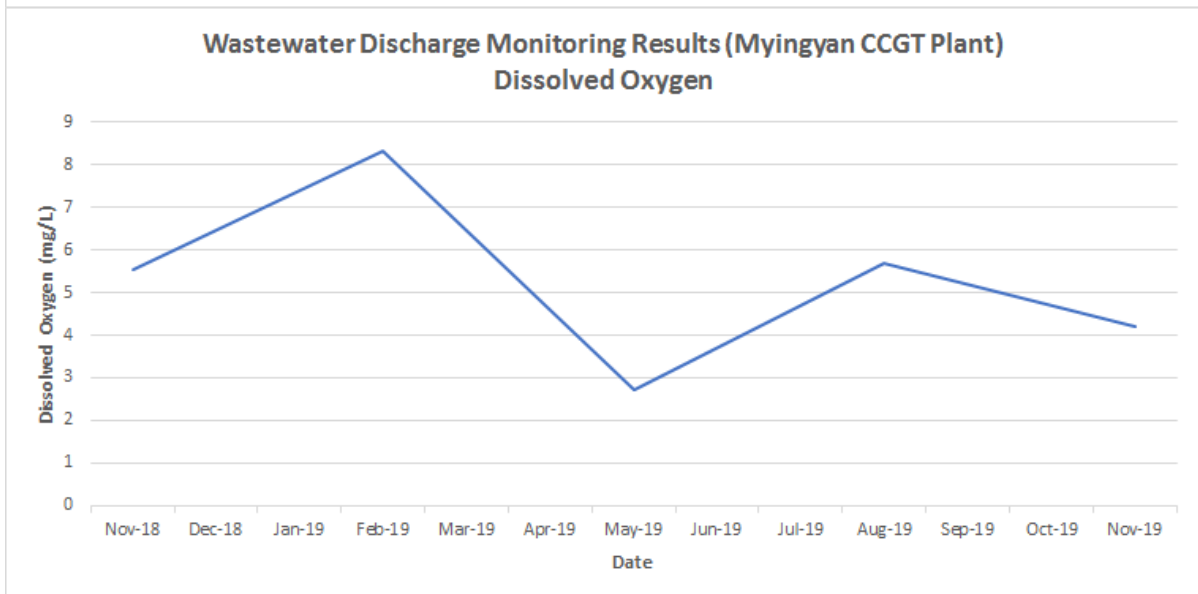
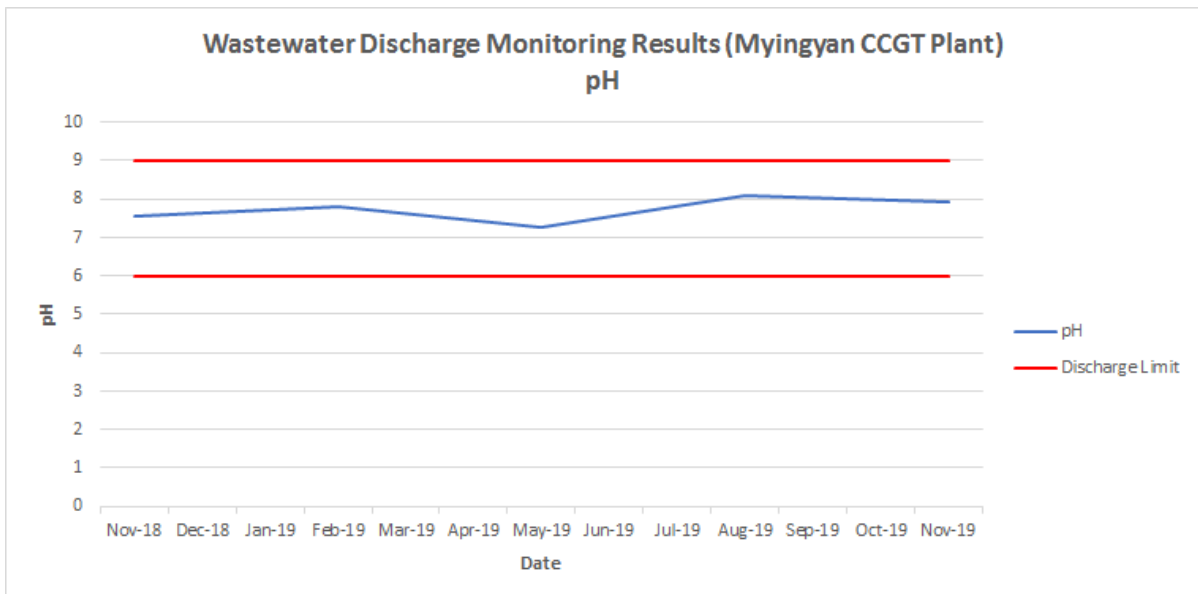
Wastewater Discharge Monitoring Results from November 2018 to November 2019 for the Myingyan CCGT Plant

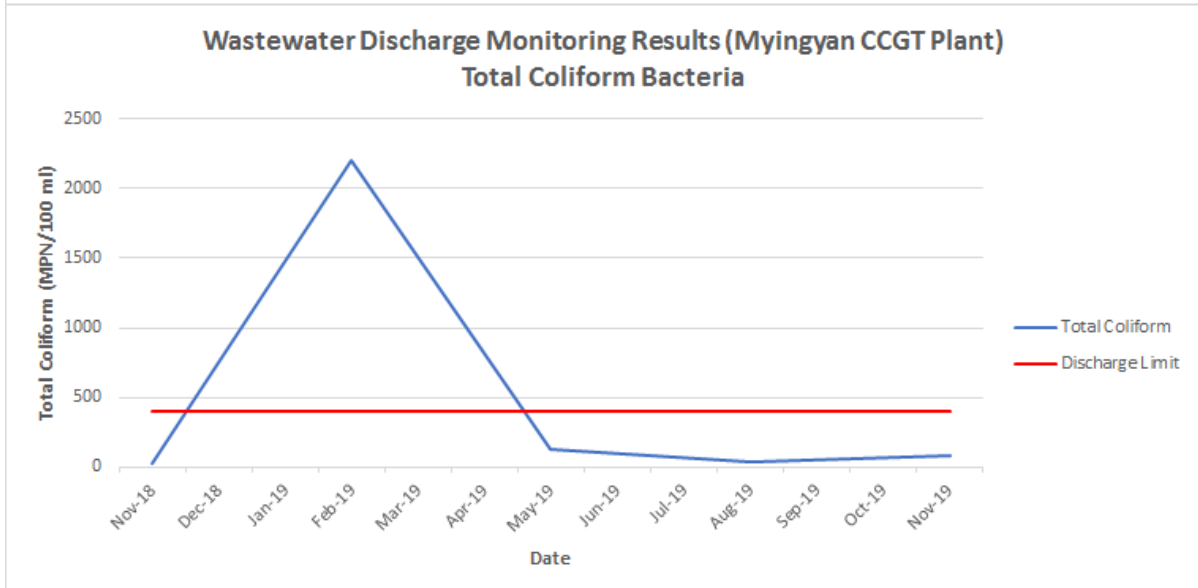
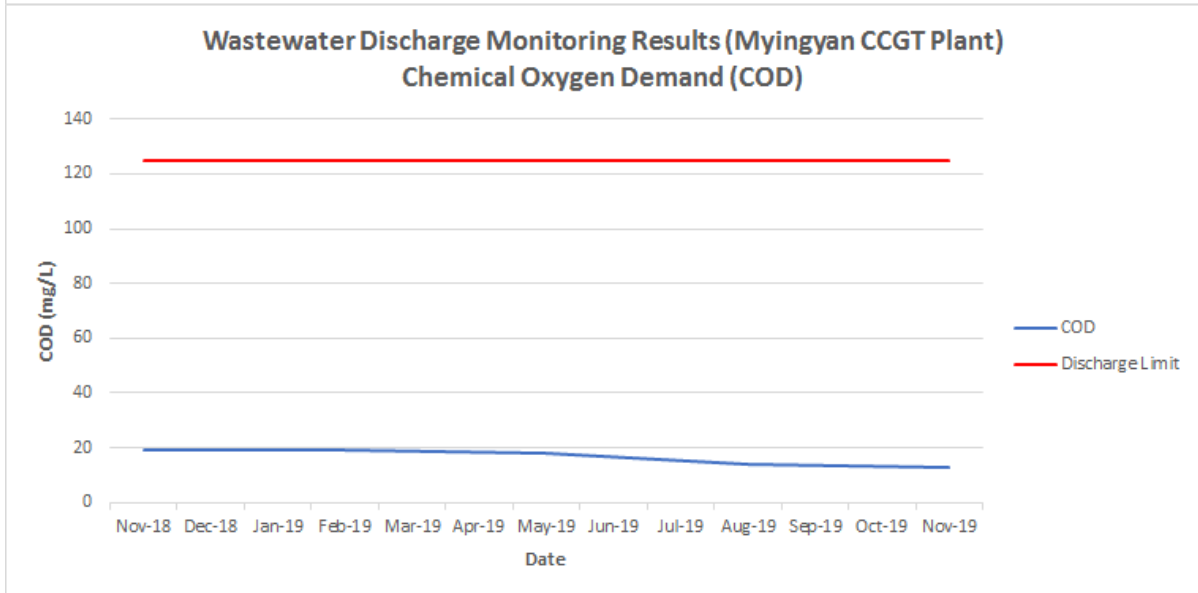
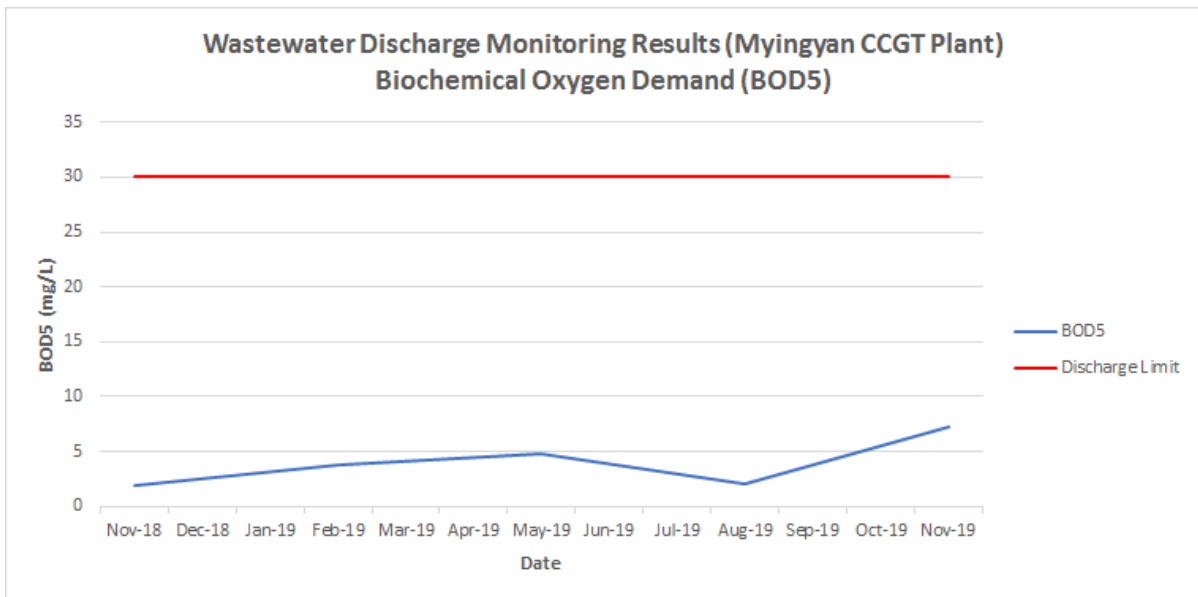
Parameters	Units	Discharge Limits	Nov-18	Feb-19	May-19	Aug-19	Nov-19
pH	-	6-9*	7.55	7.8	7.27	8.09	7.91
Dissolved Oxygen	mg/L	-	5.54	8.31	2.71	5.67	4.21
Total Suspended Solids (TSS)	mg/L	50*	12	12	12	14	12
Biochemical Oxygen Demand (BOD)	mg/L	30**	1.94	3.81	4.8	2.05	7.18
Chemical Oxygen Demand (COD)	mg/L	125**	19	19	18	14.1	13.1
Total Coliform Bacteria	MPN/100 ml	400**	23	2200	130	33	79
Total Nitrogen	mg/L	10**	1.7	4.3	2.6	1.9	3
Total Phosphorus	mg/L	2**	1.23	1.79	1.29	2.13	0.819
Oil and Grease	mg/L	10*	< 3.1	< 3.1	< 3.1	< 3.1	< 3.1
Mercury	mg/L	0.005	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002
Zinc	mg/L	1.0*	0.534	1.17	0.608	0.956	0.354
Arsenic	mg/L	0.5*	≤ 0.01	≤ 0.01	≤ 0.01	≤ 0.01	≤ 0.01
Chromium	mg/L	0.5*	≤ 0.002	≤ 0.002	≤ 0.002	0.004	0.004
Cadmium	mg/L	0.1*	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002
Copper	mg/L	0.5*	≤ 0.002	0.006	≤ 0.002	0.002	0.006
Lead	mg/L	0.5*	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002	≤ 0.002
Iron	mg/L	1.0*	0.874	1.5	1.46	2.258	2.06
Turbidity	FNU	-	4.26	12.33	13.99	28.37	26.78
Conductivity	μS	-	0.764	1.867	1.038	0.914	0.749
Total Chlorine	mg/L	0.2*	0.1	0.1	0.1	0.1	0.1

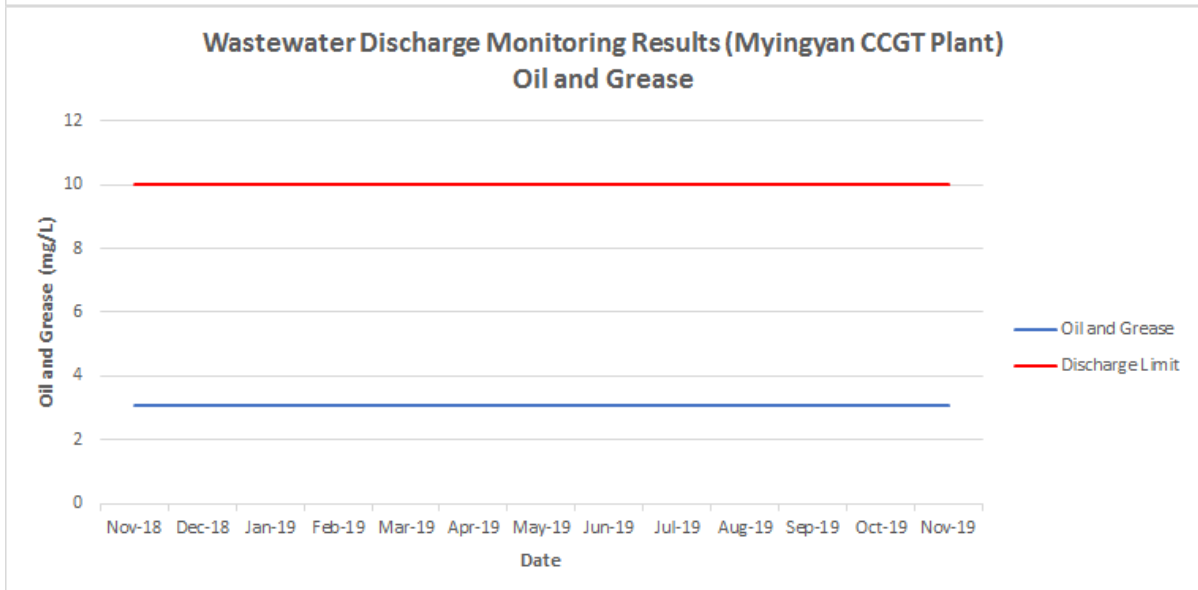
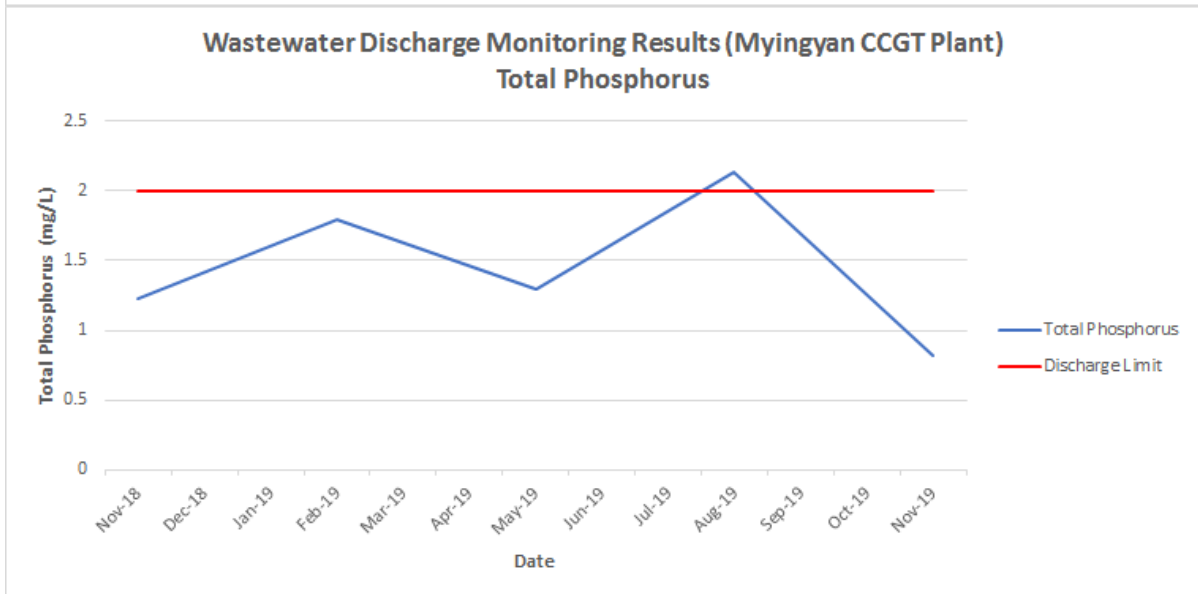
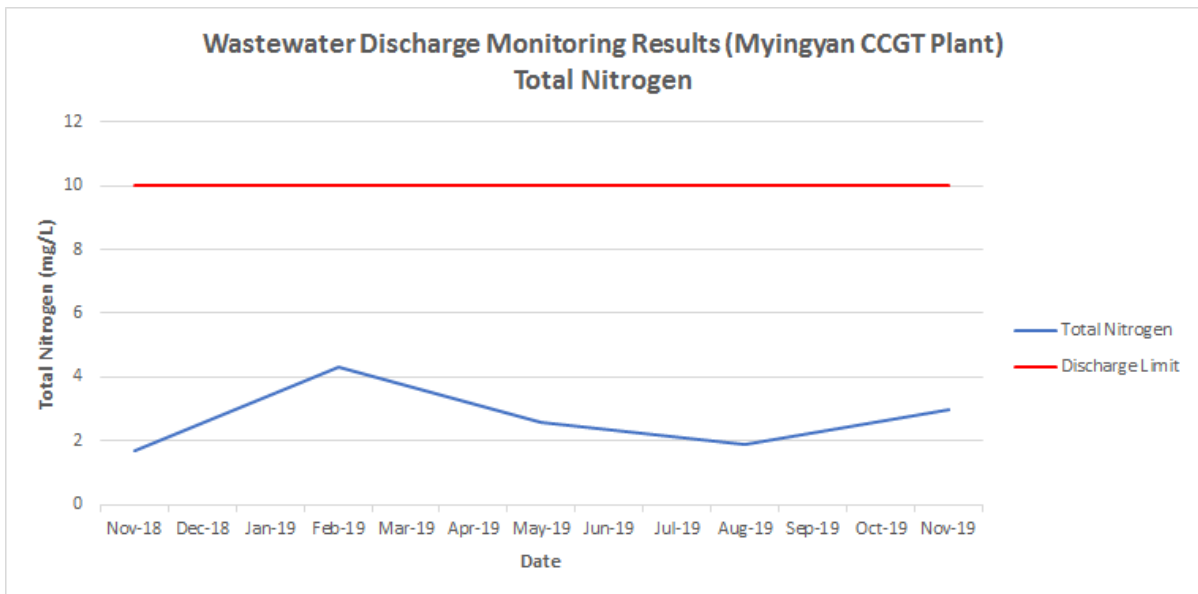
Third party monitoring of wastewater discharge conducted by Golden Dowa Ecosystem Myanmar Ltd.

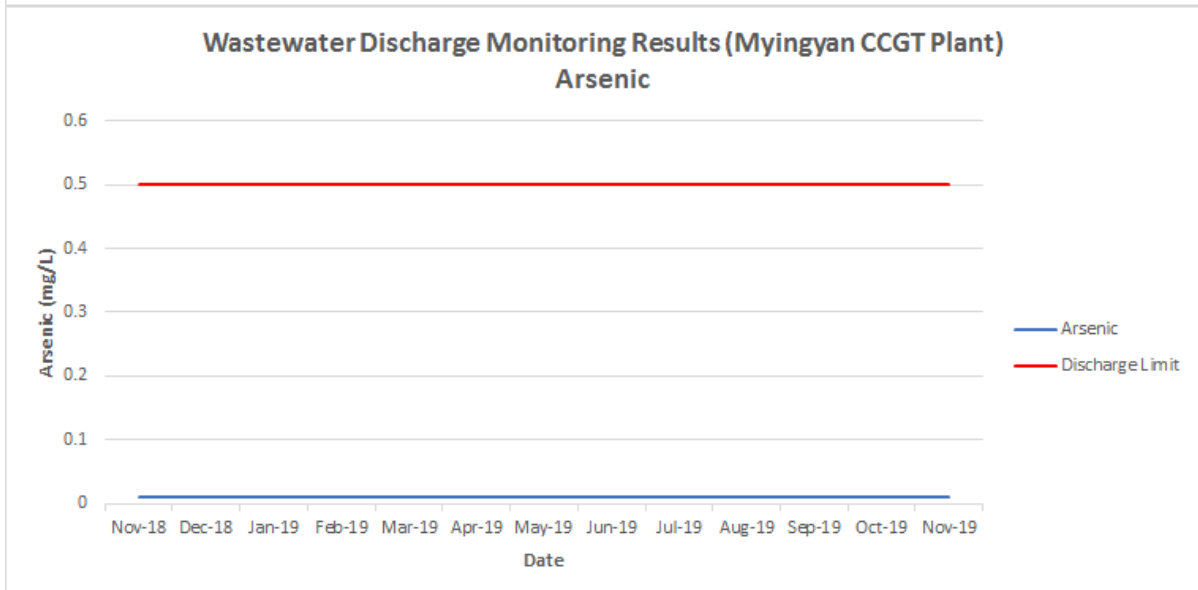
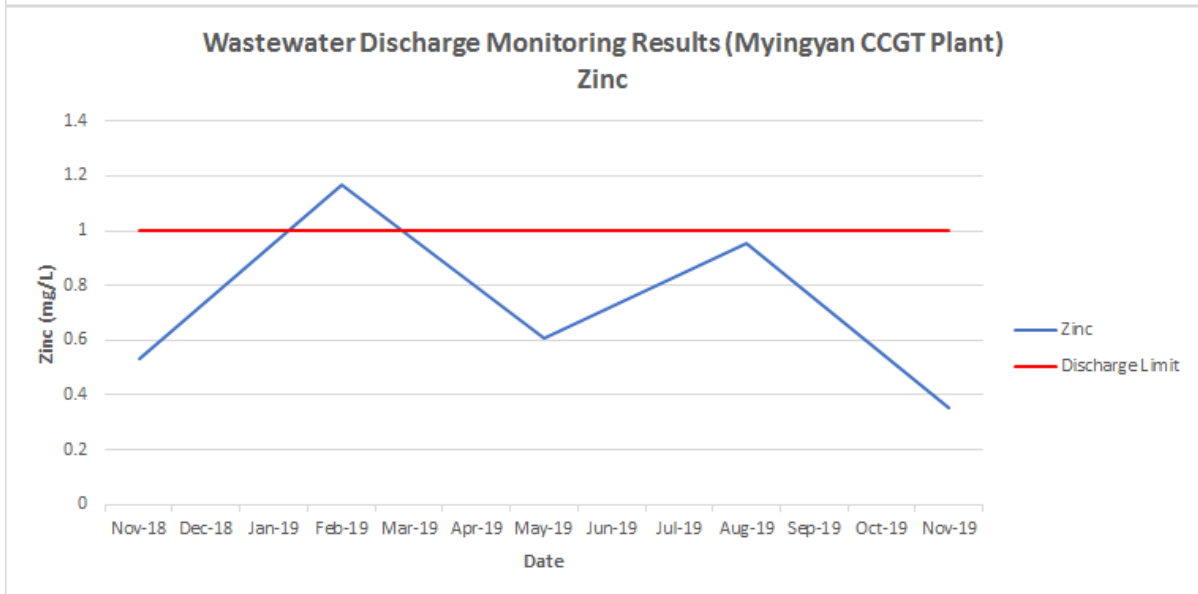
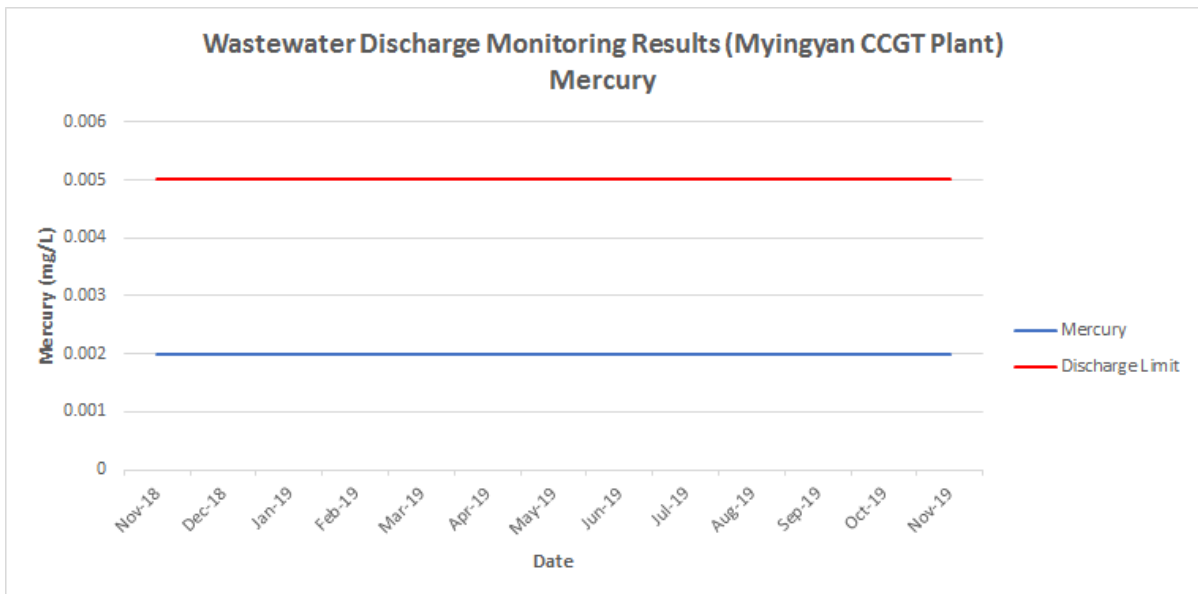
\* Myanmar NEQ Guidelines – Effluent Standards for Thermal Power (2015) / IFC EHS Guidelines Thermal Power Plants (2008).

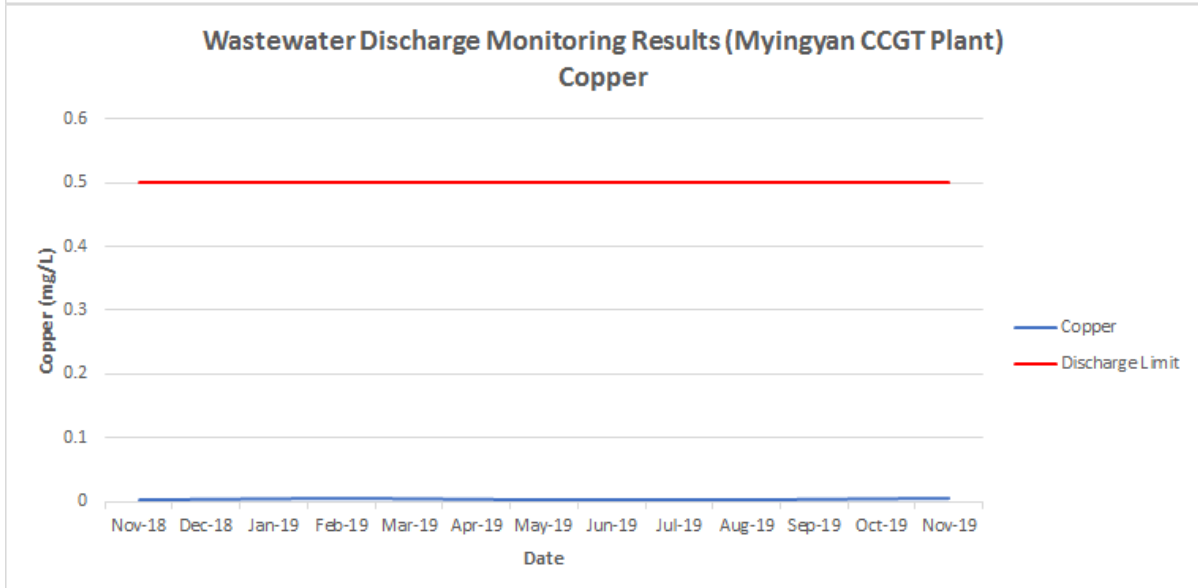
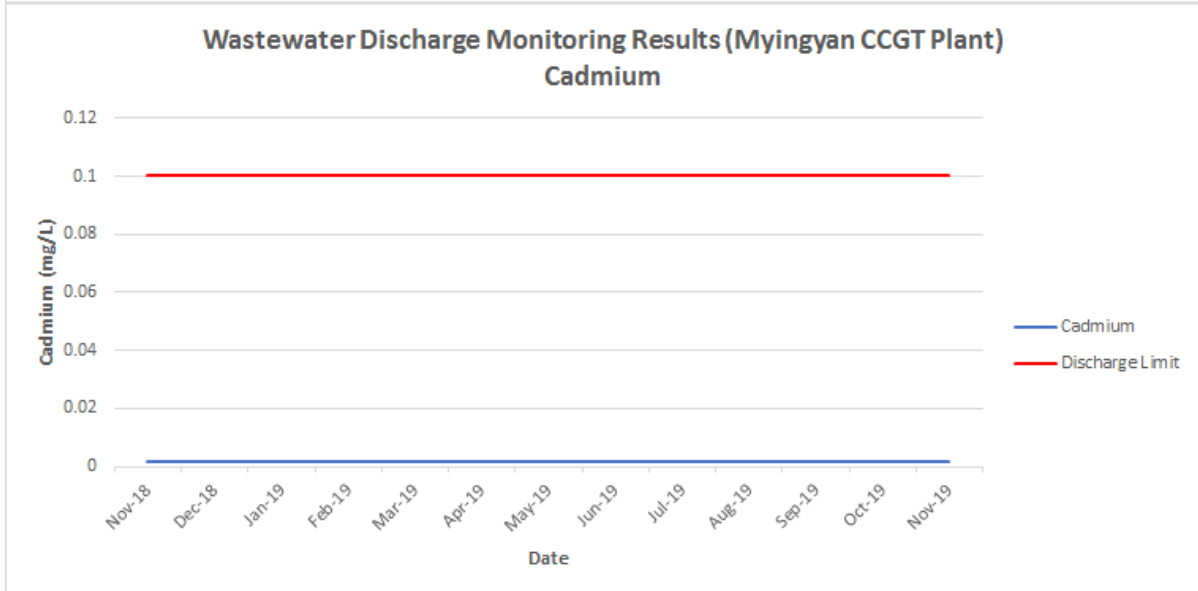
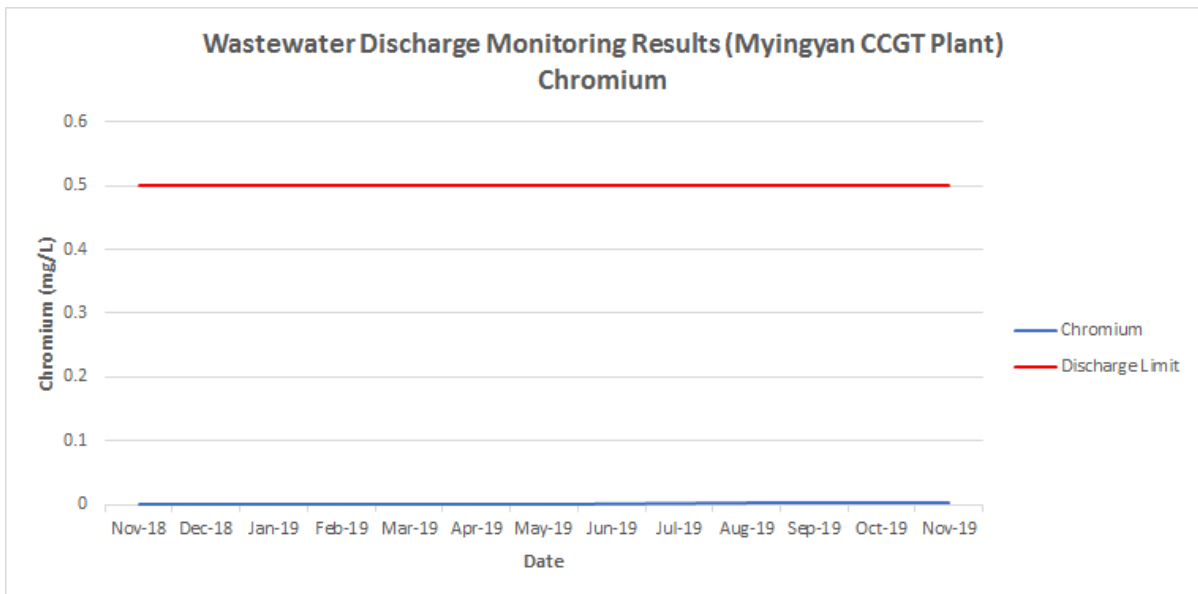
\*\* Myanmar NEQ Guidelines –Site Runoff and Wastewater Discharges 2015 / IFC General EHS Guideline: Environmental Wastewater and Ambient Water Quality (2007).

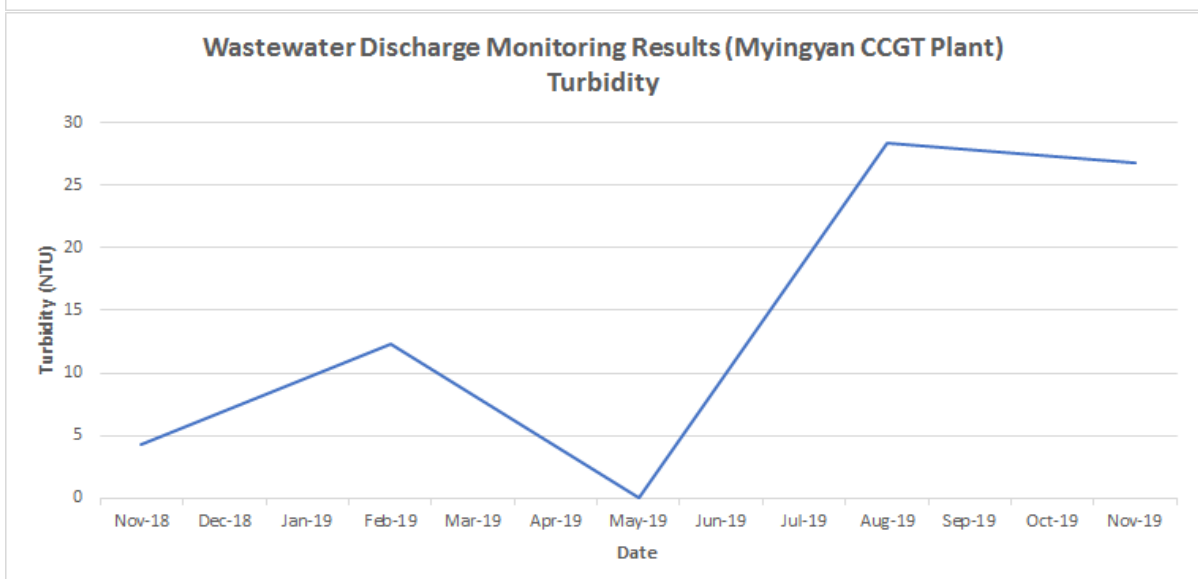
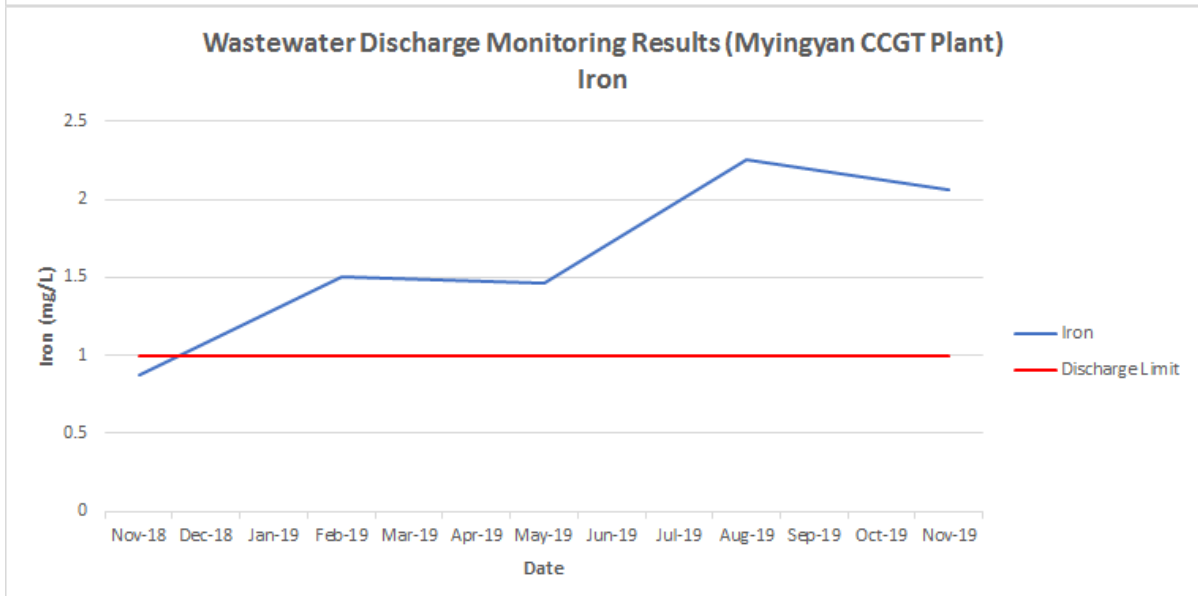
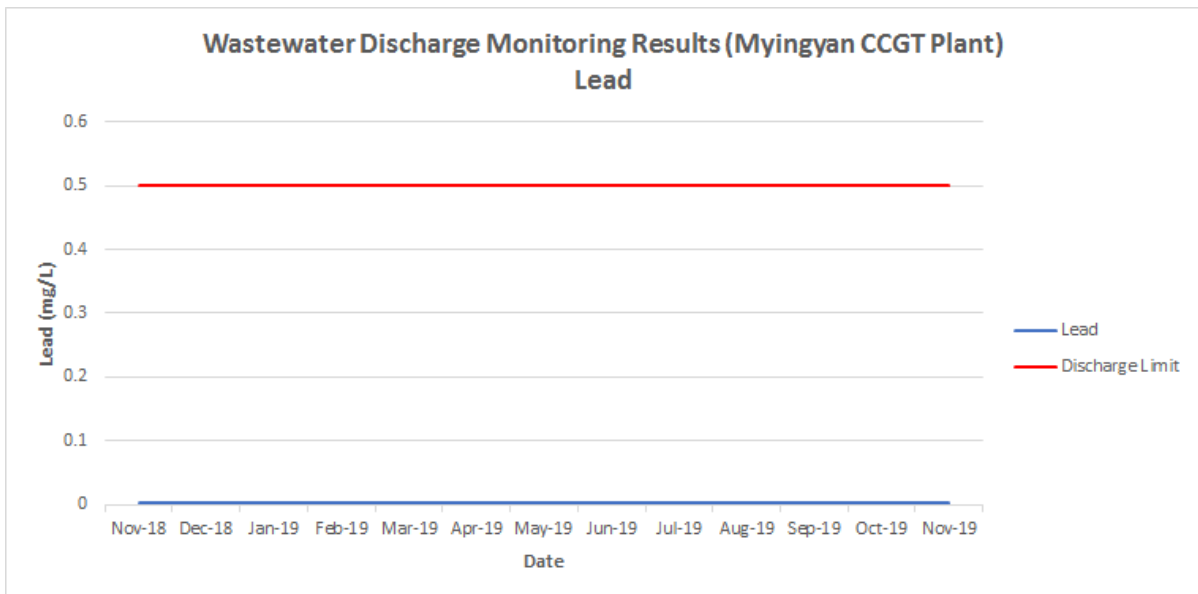




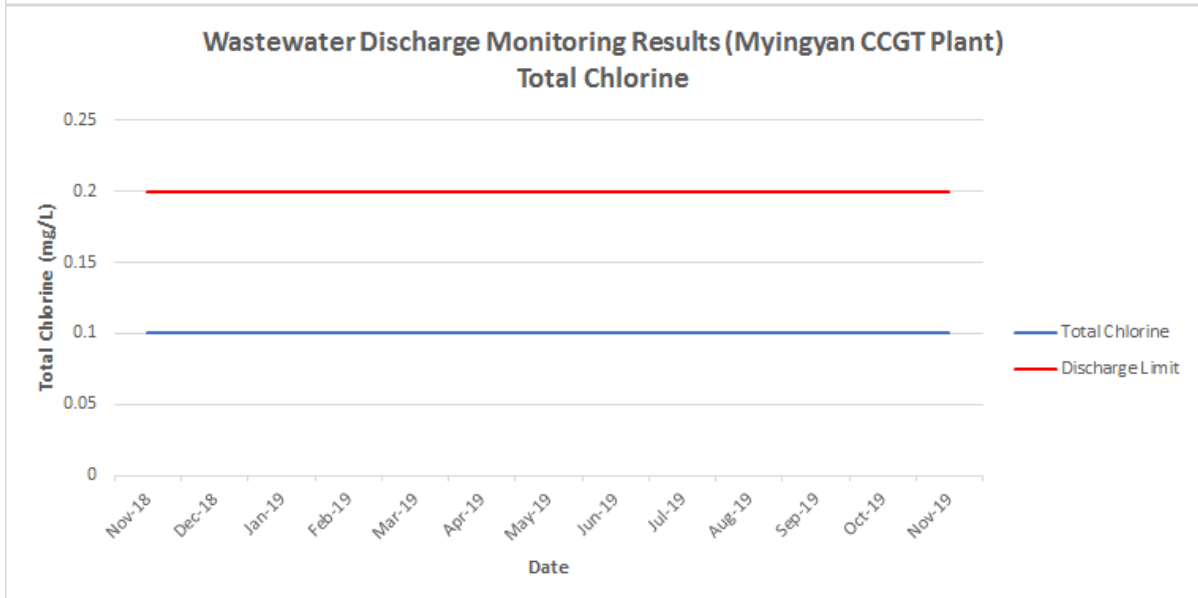
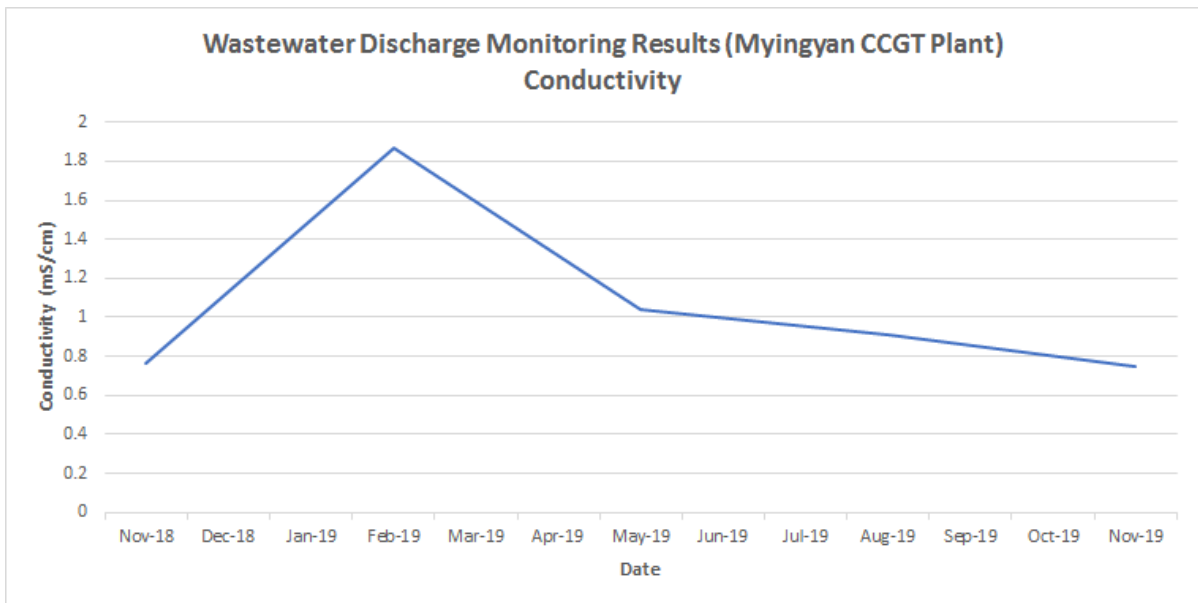












**APPENDIX 5A  
RIVER WATER SAMPLING LOCATIONS AND RESULTS**

Myingyan 225MW Combined Cycle Power Plant

## Surface Water Quality Comparison: upstream and downstream testing

# Location Map of the Sample Taken



Item	Parameter	11.12.2019			10.12.2014	IFC Standard	UOM
		● Downstream of Discharge	● Upstream of Discharge	● In River	● ESIA base line Point		
1	Temp	23.3	23.5	23.6	24.6	<3	°C
2	pH	8.15	7.98	8	8.6	6-9	
3	Conductivity (µs/cm)	192.3	133.4	156	-	<200	µs/cm
4	Turbidity (NTU)	35	46	28	-	<50	NTU
5	Iron (ppm)	0.53	0.57	0.35	-	1	mg/l
6	Total Chlorine(PPM)	0.03	0.05	0.03	-	<0.2	mg/l
7	COD (ppm)	34	32	33	9.5	125	mg/l
8	Total Nitrogen (ppm)	0	0	0	ND	10	mg/l
9	Total Phosphorus (ppm)	0	0	0	ND	2	mg/l

**Note: Discharge water temperature taken at the Central Monitoring Basin is 21.4°C**

Item	Parameter	24.12.2019			10.12.2014	IFC Standard	UOM
		Downstream of Discharge	Upstream of Discharge	In River	ESIA base line Point		
1	Temp	21.5	21.5	21.5	23.6	<3	°C
2	pH	8.04	8.18	8.1	8.6	6-9	
3	Conductivity (µs/cm)	166.5	165.4	160.3	-	<200	µs/cm
4	Turbidity (NTU)	13.9	12.8	16.3	-	<50	NTU
5	Iron (ppm)	0.16	0.15	0.22	-	1	mg/l
6	Total Chlorine(PPM)	0.01	0.01	0.03	-	<0.2	mg/l
7	COD (ppm)	0	0	0	9.5	125	mg/l
8	Total Nitrogen (ppm)	0	0	0	ND	10	mg/l
9	Total Phosphorus (ppm)	2	2.7	14.9	ND	2	mg/l

**Note: Discharge water temperature taken at the Central Monitoring Basin is 23.6°C**

**1. Increased level Total Phosphorus (PPM) due to lab error.**

Item	Parameter	02.01.2020			10.12.2014	IFC Standard	UOM
		● Downstream of Discharge	● Upstream of Discharge	● In River	● ESIA base line Point		
1	Temp	21	21	21	23.6	<3	°C
2	pH	7.82	7.74	8.02	8.6	6-9	
3	Conductivity (µs/cm)	140.5	141.5	142.8	-	<200	µs/cm
4	Turbidity (NTU)	19.2	19.9	21.6	-	<50	NTU
5	Iron (ppm)	0.45	0.83	0.64	-	1	mg/l
6	Total Chlorine(PPM)	0.02	0.01	0.01	-	<0.2	mg/l
7	COD (ppm)	0	1	0	9.5	125	mg/l
8	Total Nitrogen (ppm)	0	0	0	ND	10	mg/l
9	Total Phosphorus (ppm)	0	0	0	ND	2	mg/l

**Note: Discharge water temperature taken at the Central Monitoring Basin is 20.6°C**





- Discharged water pipeline (underground)
- Downstream water sampling point where is 30m downward away from discharged point
- Upstream water sampling point where is 30m upward away from the barge
- Plant designated water quarterly sampling point
- Baseline river water quality sampling point (near kyun U village)



**APPENDIX 5B**  
**RIVER WATER JANUARY 28, 2020 SAMPLING LOCATIONS AND RESULTS**



Report No. : GEM-LAB-202002067

Revision No. : 1

Report Date : 14 February, 2020

Application No. : 0299-C001

## Analysis Report

Client Name : Sembcorp Myingyan Power Company Limited  
Address : Beside of No.1 Steel Mill , Sa Khar Village, Myingyan.  
Project Name : Sembcorp Myingyan Power Company Limited  
Sample Description

Sample Name : Discharged pipe line sampling point \*1

Sampling Date : 28 January, 2020

Sample No. : W-2001170

Sampling By : Customer

Waste Profile No. : -

Sample Received Date : 29 January, 2020

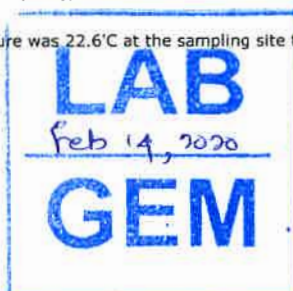
No.	Parameter	Method	Unit	Result	LOQ
1	pH	APHA 4500 H+B (Electrometric Method)	-	7.67	0.0
2	Dissolved Oxygen (DO)	APHA 4500-O G (Membrane Electrode Method)	mg/l	3.45	0.00
3	SS	APHA 2540D (Dry at 103-105°C Method)	mg/l	10	-
4	BOD (5)	HACH Method 10099 (Respirometric Method)	mg/l	5.93	0.00
5	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	17.6	0.7
6	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	130	1.8
7	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	1.6	0.5
8	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.67	0.05
9	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
10	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
11	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.344	0.005
12	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
13	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
14	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
15	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
16	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
17	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	1.706	0.005
18	Turbidity	APHA 2130 B (Nephelometric Method)	NTU	9.50	0.00
19	Conductivity	Instrument Analysis Method	mS/cm	0.977	0.000
20	Total Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.1

Remark : LOQ - Limit of Quantitation

APHA - American Public Health Association (APHA), the American Water Works Association (AWWA), and the Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 22nd edition

\*1) Sample Temperature was 22.6°C at the sampling site that information was provided by customer.

Analysed By :

Ni Ni Aye Lwin  
Assistant Manager

Approved By :

Yoshiyuki Narabe  
Manager

Report No. : GEM-LAB-202002068  
Revision No. : 1  
Report Date : 14 February, 2020  
Application No. : 0299-C001

## Analysis Report

Client Name : Sembcorp Myingyan Power Company Limited  
Address : Beside of No.1 Steel Mill , Sa Khar Village, Myingyan.  
Project Name : Sembcorp Myingyan Power Company Limited  
Sample Description

Sample Name : Upstream 100m \*1  
Sample No. : W-2001171  
Waste Profile No. : -  
Sampling Date : 28 January, 2020  
Sampling By : Customer  
Sample Received Date : 29 January, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Temperature	Instrument Analysis Method	°C	21.6	0.0
2	pH	APHA 4500 H+ B (Electrometric Method)	-	7.84	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	5.2	0.7
4	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	1.138	0.002
5	Turbidity	APHA 2130 B (Nephelometric Method)	NTU	19.63	0.00
6	Conductivity	Instrument Analysis Method	mS/cm	0.175	0.000
7	Total Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.1
8	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	0.6	0.5
9	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.05	0.05

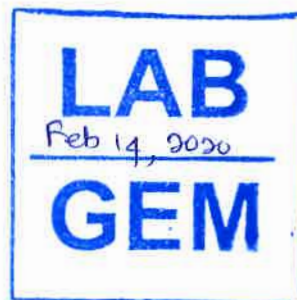
Remark : LOQ - Limit of Quantitation

APHA - American Public Health Association (APHA), the American Water Works Association (AWWA), and the Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 22nd edition

\*1) Sample Temperature was 21.7°C at the sampling site that information was provided by customer.

Analysed By :

Ni Ni Aye Lwin  
Assistant Manager



Approved By :

Yoshiyuki Narabe  
Manager Feb 14, 2020



Report No. : GEM-LAB-202002069  
 Revision No. : 1  
 Report Date : 14 February, 2020  
 Application No. : 0299-C001

## Analysis Report

Client Name : Sembcorp Myingyan Power Company Limited  
 Address : Beside of No.1 Steel Mill , Sa Khar Village, Myingyan.  
 Project Name : Sembcorp Myingyan Power Company Limited  
 Sample Description

Sample Name : Upstream mid river \*1  
 Sampling Date : 28 January, 2020  
 Sample No. : W-2001172  
 Sampling By : Customer  
 Waste Profile No. : -  
 Sample Received Date : 29 January, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Temperature	Instrument Analysis Method	°C	21.0	0.0
2	pH	APHA 4500 H+ B (Electrometric Method)	-	7.85	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	5.8	0.7
4	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	1.048	0.002
5	Turbidity	APHA 2130 B (Nephelometric Method)	NTU	22.08	0.00
6	Conductivity	Instrument Analysis Method	mS/cm	0.178	0.000
7	Total Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	< 0.1	0.1
8	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	0.5	0.5
9	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.06	0.05

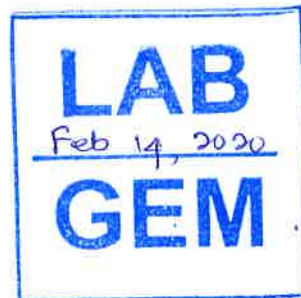
Remark : LOQ - Limit of Quantitation

APHA - American Public Health Association (APHA), the American Water Works Association (AWWA), and the Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 22nd edition

\*1) Sample Temperature was 21.7°C at the sampling site that information was provided by customer.

Analysed By :

Ni Ni Aye Lwin  
 Assistant Manager



Approved By :

Yoshiyuki Narabe  
 Manager  
 Feb 14, 2020

Report No. : GEM-LAB-202002070

Revision No. : 1

Report Date : 14 February, 2020

Application No. : 0299-C001

## Analysis Report

Client Name : Sembcorp Myingyan Power Company Limited  
Address : Beside of No.1 Steel Mill , Sa Khar Village, Myingyan.  
Project Name : Sembcorp Myingyan Power Company Limited  
Sample Description

Sample Name : Downstream 100m \*1

Sampling Date : 28 January, 2020

Sample No. : W-2001173

Sampling By : Customer

Waste Profile No. : -

Sample Received Date : 29 January, 2020

No.	Parameter	Method	Unit	Result	LOQ
1	Temperature	Instrument Analysis Method	°C	21.0	0.0
2	pH	APHA 4500 H+ B (Electrometric Method)	-	7.81	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	10.4	0.7
4	Iron	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.854	0.002
5	Turbidity	APHA 2130 B (Nephelometric Method)	NTU	16.90	0.00
6	Conductivity	Instrument Analysis Method	mS/cm	0.183	0.000
7	Total Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.1
8	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	< 0.5	0.5
9	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	< 0.05	0.05

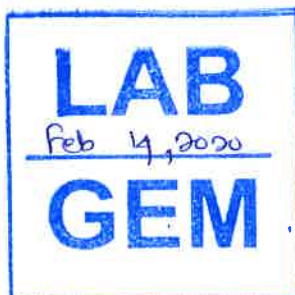
Remark : LOQ - Limit of Quantitation

APHA - American Public Health Association (APHA), the American Water Works Association (AWWA), and the Water Environment Federation (WEF), Standard Methods for the Examination of Water and Wastewater, 22nd edition

\*1) Sample Temperature was 21.7°C at the sampling site that information was provided by customer.

Analysed By :

Ni Ni Aye Lwin  
Assistant Manager



Approved By :

Yoshiyuki Narabe Feb 14, 2020  
Manager

**APPENDIX 5C  
VILLAGE PARTICIPATION OF Q1 JANUARY 2020 RIVER WATER  
SAMPLING**

River Water Sample Collecting Attendant Record of Acknowledgement

2020 - 1st Quarter

Aye	1
Gyoke Pin	2
Hnan	2
Phet Taw	4
Hta Naung Tai	1
Ka Lane Chone	1
Kyun U	1
Ma Yoe Kone	2
Nyaung Kan	2
Seik Nyan	1
Tha Pyay Thar	3
SMPC	6
Total	26

Date: 28-01-20		Time : 09.00 am ~ 11.30 am		
No.	Name	NRIC No.	Attendee's Position	Attendees' Village
1	U Myint Swe		Village Head	Aye
2	U Win Hlaing		Village Administrator	Gyoke Pin
3	U Thein Naing		Villager	Gyoke Pin
4	U Hein Min Lwin		Village Head	Hnan
5	U Hen Si		Villager	Hnan
6	U Soe Tun		Village Administrator	Phet Taw
7	U Aung Naing Oo		Villager	Phet Taw
8	U Kyaw Oo		Villager	Phet Taw
9	Daw Shwe Shwe		Villager	Phet Taw
10	U Aye Ko		Village Administrator	Hta Naung Tai
11	U Toe Myaing		Village Head	Ka Lane Chone
12	U Kyaw Toe		Village Administrator	Kyun U
13	U Win Maung		Village Head	Ma Yoe Kone
14	U Than Win		Villager	Ma Yoe Kone
15	U Shu Maung		Village Head	Nyaung Kan
16	U Htin Kyaw		Villager	Nyaung Kan
17	U Chit Win		Village Head	Seik Nyan
18	U Kyaw Tun		Villager / Fisherman	Tha Pya Thar
19	U Kyaw Lin		Villager / Farmer	Tha Pya Thar
20	U Win Shwe		Village Head	Tha Pya Thar
21	Hein Min Oo @ Koyin		SMPC / CSR	NA
22	Kevin Heng		SMPC / Commercial	NA
23	U Tin Maung Thein		SMPC / HSSE	NA
24	U Zaw Moe Aung		SMPC / HSSE	NA
25	Ko Htet Wai Yan		SMPC / O&M	NA
26	Ko Thant Ko Ko Kyaw		SMPC / CSR	NA



No.	Name	NRIC No.	Attendee's Position	Attendee's Village/ Dept;	Time	Remarks
1.	Hein Min Oo e Kyin		SMPC / CSR	-	09:00	
2.	U Kyaw Tun		Fishesman / Villager	Tha Pyay Thar	09:00	
3.	U Kyaw Lin		Farmer / Villager	Tha Pyay Thar	09:00	
4.	U Win Shwe		Village Head	Tha Pyay Thar	09:00	
5.	U Hein Min Lwin		Village Head	Hnan	09:00	
6.	U Hen Si		Villager	Hnan	09:00	
7.	U Shu Maung		Village Head	Myung Kon	09:00	
8.	U Htan Kyaw		Farmer / Villager	Myung Kon	09:00	
9.	U Chit Win		Village Head	Sate Myan	09:00	
10.	U Aye Ko		Village Administrator	Tha Nang Tin	09:00	
11.	U Kyaw Toe		Village Administrator	Kyaw U	09:00	
12.	U Toe Myaing		Village Head	Kalane Chone	09:00	
13.	U Myint Sine		Village Head	Aye	09:00	
14.	U Win Hlaing		Village Administrator	Gyoke Pin	09:00	
15.	U Maung Naing		Villager	Gyoke Pin	09:00	
16.	U See Tun		Village Administrator	Phet Tan	09:00	
17.	U Aung Naing Oo		Villager	Phet Tan	09:00	
18.	U Kyaw Oo		Villager	Phet Tan	09:00	

 Recorded by: Thant Koko Kyaw Thant  
 (Name/ Sign)

 Reviewed by: Hein Min Oo / [Signature]  
 (Name/ Sign)






# Sembcorp Myingyan Power Co., Ltd.

## River Water Sample collecting, Attendant Record of Acknowledgement

28/01/2020

No.	Name	NRIC No.	Attendee's Position	Attendee's Village/ Dept;	Time	Remarks
19	Ma Shwe Shwe	[REDACTED]	ESO Staff / Villager	Phet Taw	09:00	09-961983 783 09-6730 32878
20	U Win Maung		Village Head	Ma Yoe Kon	09:00	
21	U Thein Win		Villager	me Yoe Kon	09:00	
22	Kelvin Heng		SMPC	-	09:00	
23	U Tin Maung Thein		SMPC	-	09:00	
24	ko Thant		SMPC	-	09:00	
25	U Zau Moe Aung		SMPC	-	09:00	
26	ko Htet Wai Yan		SMPC	-	09:00	

Recorded by: Thant ko ko Kyau, Thant  
(Name/ Sign)

Reviewed by: Hein Min Oo   
(Name/ Sign)