MJTD

Thilawa Special Economic Zone (Zone A) Development

Environmental Monitoring Report (Operation Phase)

Myanmar Japan Thilawa Development Limited.

April 2018

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1. Executive Summary

The environmental inspection and compliance monitoring program will be implemented under the direction of Ministry of Natural Resources and Environmental Conservation with oversight by Thilawa SEZ Management Committee.

The monitoring record from October 2017 to March 2018 according to the Environment Monitoring Plan is submitted in conformity with the provision of Chapter 9.1, Table 9.1-2 and 9.2, Table 9.2-2 Content of the EIA Report of Thilawa SEZ Development Project (Zone A).

2. Summary of Monitoring Activities

a) Progress made to date on the implementation of the EMP against the submitted implementation schedule;

We already submitted EMP for TSEZ Zone-A as following table.

Report No.	Description	Phase	Submission
1	Environmental Monitoring Report	Phase-1 Operation Phase	April, 2016
2	Environmental Monitoring Report	Phase-1 Operation Phase	October, 2016
3	Environmental Monitoring Report	Phase-1 & 2 Operation Phase	April, 2017
4	Environmental Monitoring Report	Phase-1 & 2 Operation Phase	October, 2017

Report (No.5) is submitted this day attached with Operation Phase implementation schedule. Subsequent Operation Phase reports will be submitted on Bi-Annually.

b) Difficulties encountered in implementing of the EMP and recommendations for remedying those difficulties and steps proposed to prevent or avoid similar future difficulties;

Required clear guideline for the reference and target standard of water (such as surface water, wastewater, ground water etc.) in order to report TSEZ discharging impact.

c) Number and type of non-compliance with the EMP and proposed remedial measures and timelines for completion of remediation;

No.	Parameter	Type of Non-Compliance	Remedial Measures	Remarks
1	Suspended Solids	Exceed target value	Discussed with environmental consultant and expert for the monitoring points sources to analysis the effect and impact	Refer to the attached report of water and wastewater quality report in appendix.
2	Total Coliform	Exceed target value		

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No.	Parameter	Type of Non-Compliance	Remedial Measures	Remarks
3	Mercury	Exceed target (June-2017 to August 2017)	Investigating in progress	After finalizing the investigation report, will attach in the environmental monitoring report.

d) Accidents or incidents relating to the occupational and community health and safety, and the environment:

There was nine cases of minor accidents and no major accident happened during monitoring period at Thilawa SEZ common area. Each tenant's accidents will report directly to Environmental Section, One Stop Service Center, Thilawa SEZ Management Committee.

There was one environmental related issue that is exceeding the mercury in the discharging water from the TSEZ Zone-A. Investigation process is implementing and will attached the detail investigation report in next environmental monitoring report after finalizing the investigation report.

e) Monitoring data on environmental parameters and conditions as committed in the EMP or otherwise required.

Please refer to the attached Environmental Monitoring Form.

3. Monitoring Result

Environmental Monitoring plan report for Operation Phase implemented according to the following table, reference on Table 4.2-2, Chapter 4, EIA report.

Monitoring Plan (Operation Phase)

Category	Item	Location	Frequency	Remark
Air Quality	NO_2, SO_2, CO, TSP, PM_{10}	Representative point inside TSEZ Zone-A area	1 week each in dry and wet season (First 3 years after operation stage)	February 2018, Air quality monitoring report (Bi-Annually)
Water Quality	Water temperature, pH, SS, DO, BOD, COD, T-coliform T-N, T-P, Color and odor, HS, HCN, Oil and grease, Formaldehyde, Phenols, Cresols Free Chlorine, Zinc, Chromium, Arsenic, Copper, Mercury, Cadmium, Barium, Selenium, Lead and Nickel	Discharging points and reference points (6 points) which including outflow of retention pond to the river (1 point) Well in the Monastery (1 point)	Bi-monthly for water, temperature, pH, SS, DO, BOD, COD, T-Coliform, T-N, T-P, Color and odor Bi-annually for all parameters	October 2017 and February 2018, Water and waste water quality monitoring report (Bi-Monthly) December-2018, Water and wastewater quality monitoring report (Bi-Annually)
Waste	Status of non-hazardous waste management Status of hazardous waste management	Each tenant	Twice/ year (Submission of environmental reports by tenants	General waste disposal record (Waste generated from common area of TSEZ and Admin complex)
Noise and Vibration	Noise level at the monastery and residences to check effect of buffer zone for sound proofing to	Each tenant	One time in each dry and wet season (First 3 years after operation stage)	July 2017, Noise and vibration Monitoring Report (Bi-Annually)
Ground Subsidence	Ground elevation Consumption of ground water amount	Representative site (1 point)	Weekly	Refer to Environmental Monitoring form

Offensive Odor	Status offensive odor control by tenants	Each tenant	Twice/ year (Submission of environmental report by tenants)	Refer to Environmental Monitoring form
Bottom Sediment	Combined with water quality monitoring	Same as water quality monitoring	Same as water quality monitoring	Refer to Environmental Monitoring Form
Hydrological situation	Combined with ground subsidence monitoring	Same as ground subsidence monitoring	Same as ground subsidence monitoring	Refer to Environmental Monitoring Form
Risk for infectious disease such as AIDS/HIV	Status of measures of infectious disease	Each tenant	Twice/year (Submission of environmental report by tenants)	Refer to Environmental Monitoring form
Working conditions (including occupational safety)	Prehension of condition of occupational safety and health Prehension of infectious disease	Work site	Twice/year (Submission of environmental report by tenants)	
Accident	Existence of accident	Work site	As occasion arise	-

*Remark: Each locator will report their monitoring result directly to Environmental Section, One Stop Service Center, Thilawa SEZ Management Committee.

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Thilawa Special Economic Zone (Zone A)
Development Project (Operation Phase)

Environment Monitoring Form

Environment Monitoring Form

The latest results of the below monitoring items shall be submitted to Authorities on once at Pre-construction phase and on quarterly basis at Construction Phase, and on bi-annually base at Operation Phase. The items, standards to be applied, measurement points, and frequency for each monitoring parameter are established based on the EIA Report for Thilawa Special Economic Zone Development Project (Zone A). Should there be any changes to the original plan, such change shall be reviewed and evaluated by environmental expert.

(1) General

1) Phase of the Project

- Please mark the current phase.

□ Pre-Construction Phase □ Construction Phase ☑ Operation Phase

2) Obtainment of Environmental Permits (Not Applicable)

Name of permits	Expected issuance date	Actual issuance date	Concerned authority	Remarks (Conditions, etc.)
Confirming report of Environmental Impact Assessment		3rd December 2013	Thilawa SEZ Management Committee	
Notification of the comments of Ministry of Natural Resources and Environmental Conservation regarding with the Standard Change of Wastewater Quality of Industrial Zone, Internal Regulations of Thilawa SEZ Zone-A and Zone-B	5th January 2018	10th January 2018	Thilawa SEZ Management Committee	As Attachment

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3) Response/Actions to Comments and Guidance from Government Authorities and the Public (Not Applicable)

Monitoring Item	Monitoring Results during Report Period	Duration of Report Period	Frequency
Number and contents of formal comments made by the public		Same timing of submission of Monitoring Report	Upon receipt of comments/complaints
Number and contents of responses from Government agencies			

(2) Monitoring Results

1) Ambient/ Air Quality – February 2018

NO_2, SO_2, CO, TSP, PM10

Location	Item	Unit	Measured Value (Mean)	Measured Value (Min~Max.)	Country's Standard	Target value to be applied	*Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
Centralized Sewage treatment plant area	NO_2	ppm	0.046	0.026 - 0.067	Refer to NEQG	< 0.06	Japan	1 week each in dry and wet season	HAZSCANNER, EPAS	
	SO_2	ppm	0.004	0.000 - 0.031		< 0.04	Japan		HAZSCANNER, EPAS	
	CO	ppm	0.085	0.000 - 0.449		< 10	Japan		HAZSCANNER, EPAS	
	TSP	mg/m^3	0.114	0.405 - 0.011		< 0.33	Thailand		HAZSCANNE1R, EPAS	
	PM10	mg/m^3	0.042	0.147 – 0.004		< 0.12	Thailand		HAZSCANNER, EPAS	

***Remark: Referred to the Japan and Thailand Standard (EIA Report, Table 6.4-1) and Air Quality Monitoring Report (February 2018)**

Complains from Residents

- **Are there any complaints from residents regarding air quality in this monitoring period? ☑ Yes, □ No**
- **If yes, please describe the contents of complains and its countermeasures to fill in below the table.**

Contents of Complaints from Residents	Countermeasures
One of the villager complaints about the dust emission in front of his home due to the construction agitator when it was passed through the road.	MJTD take action as follow: - Inform to Locator's contractor about the complaints - Instruct the Locator's contractor to utilize the Thilawa SEZ Internal access road and only accept the Gate-2 for entrance and exit of Thilawa SEZ Zone-A. - Assign to security out-source to more inspection and monitor at that nearest complaints area and restrict the construction machineries utilization of it.

2)(a) Water Quality – October 2017

Measuring Point: Effluent of Wastewater (Thilawa SEZ discharging point which need to be monitored according to EIA are SW-1, SW-5 and SW-6. SW-2, SW-3 and SW-4 natural creek water which are combine all the wastewater from the Local industrial water and domestic water from existing living environment are attach as reference points only. GW-1 is also as reference point for monitoring of existing tube well located in the Monastery compound.)

- Are there any effluents to water body in this monitoring period? ☑ Yes, □ No

If yes, please attach "Analysis Record" and fill in the items not to comply with Refereed International Standard.

Location	Item	Unit	Measured Value	Country's Standard*6	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
SW-1	pH	-	8.9	6-9	5.0-9.0	>=4	Once in two months	Instrument Analysis Method	
	SS*2	ppm	114	50	Max.30			APHA 2540D Method	
	DO	ppm	6.8	-	-			Instrument Analysis Method	
	COD(Cr)	ppm	11.6	250	Max.70			APHA 5220D Method	
	BOD	ppm	12.91	50	Max.20			APHA-5210B Method	
	T-N	ppm	2	-	Max.80			HACH Method 10072	
	T-P	ppm	0.27	2	-			APHA 4500-PE	

Location	Item	Unit	Measured Value	Country's Standard*6	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	Color	Co.Pt	9.67	-	-			APHA 2120C	
	Odor	Co.Pt	1	-	-			APHA 2150B	
	Total coliforms*4	MPN/100ml	24000	400	Max.400	7.5×10^3		APHA 9221B	
SW-5	pH	-	8.8	6-9	5.0-9.0			Instrument Analysis Method	
	SS*2	ppm	414	50	Max.30			APHA 2540D Method	
	DO	ppm	5.4	-	-	>=4		Instrument Analysis Method	
	COD(Cr)	ppm	8.1	250	Max.70			APHA 5220D Method	
	BOD	ppm	4.82	50	Max.20		Once in two months	APHA-5210B Method	
	T-N	ppm	6.0	-	Max.80			HACH Method 10072	
	T-P	ppm	0.352	2	-			APHA 4500-PE	
	Color	Co.Pt	7.96	-	-			APHA 2120C	
	Odor	Co.Pt	1	-	-			APHA 2150B	
	Total coliforms*4	MPN/100ml	> 160,000	400	Max.400	7.5×10^3		APHA 9221B	
SW-6	pH	-	6.8	6-9	5.0-9.0	>=4		Instrument Analysis Method	
	SS	ppm	4	50	Max.30			APHA 2540D Method	
	DO	ppm	7.3	-	-			Instrument Analysis Method	
	COD(Cr)	ppm	5.7	250	Max.70		Once in two months	APHA 5220D Method	
	BOD	ppm	2.62	50	Max.20			APHA-5210B Method	
	T-N	ppm	4.0	-	Max.80			HACH Method 10072	
	T-P	ppm	< 0.05	2	-			APHA 4500-PE	
	Color	Co.Pt	0.00	-	-	7.5×10^3		APHA 2120C	

Location	Item	Unit	Measured Value	Country's Standard*6	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	Odor	Co.Pt	1.4	-	-			APHA 2150B	
	Total coliforms	MPN/100ml	< 1.8	400	Max.400			APHA 9221B	
SW-2 (Reference Point)	pH	-	7.4	6-9	5.0-9.0	>=4	Once in two months	Instrument Analysis Method	
	SS*3	ppm	36	50	Max.30			APHA 2540D Method	
	DO	ppm	3.7	-	-			Instrument Analysis Method	
	COD(Cr)	ppm	12.4	250	Max.70			APHA 5220D Method	
	BOD	ppm	3.51	50	Max.20			APHA-5210B Method	
	T-N	ppm	0.7	-	Max.80			HACH Method 10072	
	T-P	ppm	0.122	2	-			APHA 4500-PE	
	Color	Co.Pt	21.28	-	-			APHA 2120C	
	Odor	Co.Pt	1	-	-			APHA 2150B	
	Total coliforms*5	MPN/100ml	> 160,000	400	Max.400			APHA 9221B	
SW-3 (Reference Point)	pH	-	7.4	6-9	5.0-9.0	>=4	Once in two months	Instrument Analysis Method	
	SS*3	ppm	110	50	Max.30			APHA 2540D Method	
	DO	ppm	6.9	-	-			Instrument Analysis Method	
	COD(Cr)	ppm	9.7	250	Max.70			APHA 5220D Method	
	BOD	ppm	3.68	50	Max.20			APHA-5210B Method	
	T-N	ppm	2.6	-	Max.80			HACH Method 10072	
	T-P	ppm	0.218	2	-			APHA 4500-PE	
	Color	Co.Pt	11.41	-	-			APHA 2120C	
	Odor	Co.Pt	1	-	-			APHA 2150B	

Location	Item	Unit	Measured Value	Country's Standard*6	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	Total coliforms*5	MPN/100ml	160,000	400	Max.400			APHA 9221B	
SW-4 (Reference Point)	pH	-	7.2	6-9	5.0-9.0			Instrument Analysis Method	
	SS*3	ppm	92	50	Max.30			APHA 2540D Method	
	DO	ppm	6.9	-	-	>=4		Instrument Analysis Method	
	COD(Cr)	ppm	9.6	250	Max.70			APHA 5220D Method	
	BOD	ppm	5.28	50	Max.20		Once in two months	APHA-5210B Method	
	T-N	ppm	1.2	-	Max.80			HACH Method 10072	
	T-P	ppm	0.182	2	-			APHA 4500-PE	
	Color	Co.Pt	9.36	-	-			APHA 2120C	
	Odor	Co.Pt	1	-	-			APHA 2150B	
	Total coliforms*5	MPN/100ml	160,000	400	Max.400			APHA 9221B	
GW-1 (Reference Point)	pH	-	7.9	None (Available Guideline value determined by MONREC)	None (Available Guideline Value determined by MOI)	5.5~9.0	Once in two months	Instrument Analysis Method	
	SS	ppm	6			50		APHA 2540D Method	
	DO	ppm	5.9			>=4		Instrument Analysis Method	
	COD(Cr)	ppm	5.5			60		APHA 5220D Method	
	BOD	ppm	8.5			15		APHA-5210B Method	
	T-N	ppm	2.0			0.1		HACH Method 10072	
	T-P	ppm	0.075			0.04		APHA 4500-PE	
	Color	Co.Pt	0.44					APHA 2120C	
	Odor	Co.Pt	1					APHA 2150B	
	Total coliforms	MPN/100ml	23			7.5×10^3		APHA 9221B	

*[1]Remark: Referred to the Vietnam Standard (EIA Report), Reference to the Water Quality Monitoring Report, October 2017.

*[2]Remark: In SW-1 and SW-5, suspended solids are higher than the target value due to the expected reason- i) surface water run-off from bare land in Zone A and ii) influence by water from the downstream of the retention pond (SW-1) and retention canal (SW-5) due to flow back by tide fluctuation.

*[3]Remark: For reference monitoring points (SW-2, SW-3 and SW-4), the result of suspended solids is higher than the target value due to two expected reason: i) delivered from upstream area such as natural origin and wastewater from the local industrial zone which outside of Thilawa SEZ and ii) delivered from downstream area by tidal effect.

*[4]Remark: In SW-1 and SW-5, Total coliform are higher than the target value due to the expected reason- i) the potential expected reason might natural bacteria existed in all area of Zone A because there are various kinds of vegetation and creature such as birds, and small animals in and along the retention canals and retention ponds and ii) the second suspect might be influence by water from the downstream of retention pond (SW-1) and retention canal (SW-5) due to flow back by tidal fluctuation.

*[5]Remark: For reference monitoring points (SW-2, SW-3 and SW-4), the result of total coliforms is higher than the standard due to two expected reason: i) runoff of animal waste from the undeveloped area and delivered from local industrial zone and illegal dumping site from outside of Thilawa SEZ in the upstream area, and ii) delivered from downstream area by tidal effect.

*[6]Remarks: There is no current country standard but Ministry of Natural Recourses and Environmental Conservation submitted the National Emission Quality Guidelines (NEQG) for environmental guidelines. The guidelines filled as the country standards in the environmental monitoring form.

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2)(b) Water Quality – December 2017

Measuring Point: Effluent of Wastewater

- Are there any effluents to water body in this monitoring period? ☑ Yes, □ No

If yes, please attach "Analysis Record" and fill in the items not to comply with Refereed International Standard.

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
SW-1	Temperature	°C	33.6	< 3 (increase)	Max 40			Instrument Analysis Method	
	pH	-	8.2	6-9	5.0-9.0			Instrument Analysis Method	
	SS*2	mg/l	226	50	Mas 30			APHA 2540D Method	
	DO	mg/l	6.17	-	-	>=4		Instrument Analysis Method	
	BOD	mg/l	8.76	50	Max 20			APHA-5210B Method	
	COD(Cr)	mg/l	9	250	Max 70*4			APHA 5220D Method	
	Total Coliform*4	MPN/100ml	92000	400	Max 400	7.5×10^3		APHA-9221B Method	
	T-N	mg/l	4.9	-	Max 80		Twice in one	HACH Method 10072	
	T-P	mg/l	< 0.05	2	-		year	APHA 4500-P E Method	
	Color	Co.Pt	10.74	-	Max 150			APHA-2120C Method	
	Odor	Co Pt	1	-	-			APHA-2150B Method	
	HS*12	mg/l	0.248	1	Max 1			HACH 8131 Method	
	Oil and Grease	mg/l	< 3.1	10	Max 5			APHA-5520B Method	
	Formaldehyde	mg/l	0.05	-	Max 1			USEPA Method 420.1 Method	
	Phenols	mg/l	< 0.002	0.5	Max 1			APHA 3120B	
	Free Chlorine	mg/l	0.1	0.2	Max 1			HACH 8131	
	Zinc	mg/l	0.01	2	Max 5			APHA-3120B Method	

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Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
SW-1	Chromium	mg/l	0.018	0.5	Max 0.5			APHA-3120B Method	
	Arsenic	mg/l	0.014	0.1	Max 0.25			APHA-3120B Method	
	Copper	mg/l	≤ 0.002	0.5	Max 1			APHA-3120B Method	
	Mercury	mg/l	≤ 0.002	0.01	Max 0.005			APHA-3120B Method	
	Cadmium	mg/l	≤ 0.001	0.1	Max 0.03		Twice in one	APHA-3120B Method	
	Barium	mg/l	0.052	-	Max 1		year	APHA-3120B Method	
	Selenium	mg/l	≤ 0.01	0.1	Max 0.02			APHA-3120B Method	
	Lead	mg/l	≤ 0.002	0.1	Max 0.2			APHA-3120B Method	
	Nickel	mg/l	0.03	0.5	Max 0.2			HACH 8027 Method	
	Cyanide	mg/l	0.03	1	Max 1			APHA 4500 CL G Method	
SW-5	Temperature	°C	32.1	< 3 (increase)	Max 40			Instrument Analysis Method	
	pH	-	8	6-9	5.0-9.0			Instrument Analysis Method	
	SS*2	mg/l	26	50	Mas 30			APHA 2540D Method	
	DO	mg/l	4.37	-	-	>=4		Instrument Analysis Method	
	BOD	mg/l	7.58	50	Max 20			APHA-5210B Method	
	COD(Cr)	mg/l	11.6	250	Max 70*1		Twice in one	APHA 5220D Method	
	Total Coliform*4	MPN/100ml	> 160,000	400	Max 400	7.5×10^3	year	APHA-9221B Method	
	T-N	mg/l	1.1	-	Max 80			HACH Method 10072	
	T-P	mg/l	0.073	2	-			APHA 4500-P E Method	
	Color	Co.Pt	13.62	-	Max 150			APHA-2120C Method	
	Odor	Co Pt	1	-	-			APHA-2150B Method	

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
SW-5	HS	mg/l	0.046	1	Max 1			HACH 8131 Method	
	Oil and Grease	mg/l	< 3.1	10	Max 5			APHA-5520B Method	
	Formaldehyde	mg/l	0.017	-	Max 1			USEPA Method 420.1 Method	
	Phenols	mg/l	< 0.002	0.5	Max 1			APHA 3120B	
	Free Chlorine	mg/l	< 0.1	0.2	Max 1			HACH 8131	
	Zinc	mg/l	≤ 0.002	2	Max 5			APHA-3120B Method	
	Chromium	mg/l	≤ 0.002	0.5	Max 0.5			APHA-3120B Method	
	Arsenic	mg/l	0.012	0.1	Max 0.25		Twice in one	APHA-3120B Method	
	Copper	mg/l	≤ 0.002	0.5	Max 1		year	APHA-3120B Method	
	Mercury	mg/l	≤ 0.002	0.01	Max 0.005			APHA-3120B Method	
	Cadmium	mg/l	≤ 0.001	0.1	Max 0.03			APHA-3120B Method	
	Barium	mg/l	0.032	-	Max 1			APHA-3120B Method	
	Selenium	mg/l	≤ 0.01	0.1	Max 0.02			APHA-3120B Method	
	Lead	mg/l	0.018	0.1	Max 0.2			APHA-3120B Method	
	Nickel	mg/l	0.004	0.5	Max 0.2			HACH 8027 Method	
	Cyanide	mg/l	0.002	1	Max 1			APHA 4500 CL G Method	
SW-6	Temperature	°C	28.8	< 3 (increase)	Max 40			Instrument Analysis Method	
	pH	-	7.2	6-9	5.0-9.0			Instrument Analysis Method	
	SS	mg/l	2	50	Mas 30		Twice in one	APHA 2540D Method	
	DO	mg/l	7.33	-	-	>=4	year	Instrument Analysis Method	
	BOD	mg/l	2.17	50	Max 20			APHA-5210B Method	

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
SW-6	COD(Cr)	mg/l	4.9	250	Max 70*			APHA 5220D Method	
	Total Coliform	MPN/100ml	< 1.8	400	Max 400	7.5×10^3		APHA-9221B Method	
	T-N	mg/l	11.1	-	Max 80			HACH Method 10072	
	T-P	mg/l	< 0.05	2	-			APHA 4500-P E Method	
	Color	Co.Pt	6.81	-	Max 150			APHA-2120C Method	
	Odor	-	1	-	-			APHA-2150B Method	
	HS	mg/l	< 0.005	1	Max 1			HACH 8131 Method	
	Oil and Grease	mg/l	< 3.1	10	Max 5			APHA-5520B Method	
	Formaldehyde	mg/l	0.024	-	Max 1			USEPA Method 420.1 Method	
	Phenols	mg/l	< 0.002	0.5	Max 1		Twice in one	APHA 3120B	
	Free Chlorine	mg/l	0.1	0.2	Max 1		year	HACH 8131	
	Zinc	mg/l	≤ 0.002	2	Max 5			APHA-3120B Method	
	Chromium	mg/l	≤ 0.002	0.5	Max 0.5			APHA-3120B Method	
	Arsenic	mg/l	≤ 0.01	0.1	Max 0.25			APHA-3120B Method	
	Copper	mg/l	≤ 0.002	0.5	Max 1			APHA-3120B Method	
	Mercury	mg/l	≤ 0.002	0.01	Max 0.005			APHA-3120B Method	
	Cadmium	mg/l	≤ 0.001	0.1	Max 0.03			APHA-3120B Method	
	Barium	mg/l	0.008	-	Max 1			APHA-3120B Method	
	Selenium	mg/l	≤ 0.01	0.1	Max 0.02			'APHA-3120B Method	
	Lead	mg/l	≤ 0.002	0.1	Max 0.2			APHA-3120B Method	
	Nickel	mg/l	0.01	0.5	Max 0.2			HACH 8027 Method	

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Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
SW-6	Cyanide	mg/l	< 0.002	1	Max 1			APHA 4500 CL G Method	
SW-2	Temperature	°C	28.0	< 3 (increase)	Max 40			Instrument Analysis Method	
(Reference	pH	-	7.3	6-9	5.0-9.0			Instrument Analysis Method	
Point)	SS*3	mg/l	160	50	Mas 30			APHA 2540D Method	
	DO	mg/l	4.44	-	-	>=4		Instrument Analysis Method	
	BOD	mg/l	6.01	50	Max 20			APHA-5210B Method	
	COD(Cr)	mg/l	30.5	250	Max 70*4			APHA 5220D Method	
	Total Coliform	MPN/100ml	49	400	Max 400	7.5×10^3		APHA-9221B Method	
	T-N	mg/l	1.8	-	Max 80			HACH Method 10072	
	T-P	mg/l	0.137	2	-			APHA 4500-P E Method	
	Color	Co.Pt	30.03	-	Max 150		Twice in one	APHA-2120C Method	
	Odor	-	1	-	-		year	APHA-2150B Method	
	HS	mg/l	0.19	1	Max 1			HACH 8131 Method	
	Oil and Grease	mg/l	< 3.1	10	Max 5			APHA-5520B Method	
	Formaldehyde	mg/l	0.071	-	Max 1			USEPA Method 420.1 Method	
	Phenols	mg/l	0.002	0.5	Max 1			APHA 3120B	
	Free Chlorine	mg/l	0.1	0.2	Max 1			HACH 8131	
	Zinc	mg/l	≤ 0.002	2	Max 5			APHA-3120B Method	
	Chromium	mg/l	0.01	0.5	Max 0.5			APHA-3120B Method	
	Arsenic	mg/l	0.016	0.1	Max 0.25			APHA-3120B Method	
	Copper	mg/l	≤ 0.002	0.5	Max 1			APHA-3120B Method	

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
SW-2	Mercury	mg/l	≤ 0.002	0.01	Max 0.005			APHA-3120B Method	
(Reference	Cadmium	mg/l	≤ 0.001	0.1	Max 0.03			APHA-3120B Method	
Point)	Barium	mg/l	0.056	-	Max 1		Twice in one	APHA-3120B Method	
	Selenium	mg/l	≤ 0.01	0.1	Max 0.02		year	APHA-3120B Method	
	Lead	mg/l	≤ 0.002	0.1	Max 0.2			APHA-3120B Method	
	Nickel	mg/l	0.016	0.5	Max 0.2			HACH 8027 Method	
	Cyanide	mg/l	0.01	1	Max 1			APHA 4500 CL G Method	
SW-3	Temperature	°C	25.5	< 3 (increase)	Max 40			Instrument Analysis Method	
(Reference	pH	-	7.1	6-9	5.0-9.0			Instrument Analysis Method	
Point)	SS*3	mg/l	332	50	Mas 30			APHA 2540D Method	
	DO	mg/l	7.79	-	-			Instrument Analysis Method	
	BOD	mg/l	7.29	50	Max 20	>=4		APHA-5210B Method	
	COD(Cr)	mg/l	5.9	250	Max 70*4			APHA 5220D Method	
	Total Coliform*5	MPN/100ml	160,000	400	Max 400		Twice in one	APHA-9221B Method	
	T-N	mg/l	3.8	-	Max 80	7.5×10^3	year	HACH Method 10072	
	T-P	mg/l	< 0.05	2	-			APHA 4500-P E Method	
	Color	Co.Pt	15.96	-	Max 150			APHA-2120C Method	
	Odor	-	1	-	-			APHA-2150B Method	
	HS	mg/l	0.346	1	Max 1			HACH 8131 Method	
	Oil and Grease	mg/l	< 3.1	10	Max 5			APHA-5520B Method	
	Formaldehyde	mg/l	0.098	-	Max 1	3		USEPA Method 420.1 Method	

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	Phenols	mg/l	< 0.002	0.5	Max 1			APHA 3120B	
	Free Chlorine	mg/l	0.3	0.2	Max 1			HACH 8131	
	Zinc	mg/l	0.026	2	Max 5			APHA-3120B Method	
	Chromium	mg/l	0.032	0.5	Max 0.5			APHA-3120B Method	
	Arsenic	mg/l	0.02	0.1	Max 0.25			APHA-3120B Method	
SW-3	Copper	mg/l	≤ 0.002	0.5	Max 1		Twice in one	APHA-3120B Method	
(Reference	Mercury	mg/l	≤ 0.002	0.01	Max 0.005		year	APHA-3120B Method	
Point)	Cadmium	mg/l	≤ 0.001	0.1	Max 0.03			APHA-3120B Method	
	Barium	mg/l	0.056	-	Max 1			APHA-3120B Method	
	Selenium	mg/l	≤ 0.01	0.1	Max 0.02			APHA-3120B Method	
	Lead	mg/l	≤ 0.002	0.1	Max 0.2			APHA-3120B Method	
	Nickel	mg/l	0.048	0.5	Max 0.2			HACH 8027 Method	
	Cyanide	mg/l	0.021	1	Max 1			APHA 4500 CL G Method	
SW-4	Temperature	°C	25.9	< 3 (increase)	Max 40			Instrument Analysis Method	
(Reference	pH	-	7.4	6-9	5.0-9.0			Instrument Analysis Method	
Point)	SS*3	mg/l	284	50	Mas 30		Twice in one	APHA 2540D Method	
	DO	mg/l	6.58	-	-	>=4	year	Instrument Analysis Method	
	BOD	mg/l	6.07	50	Max 20			APHA-5210B Method	
	COD(Cr)	mg/l	5.8	250	Max 70*4			APHA 5220D Method	
	Total Coliform*5	MPN/100ml	160,000	400	Max 400	7.5×10^3		APHA-9221B Method	
	T-N	mg/l	3.1	-	Max 80			HACH Method 10072	

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	T-P	mg/l	< 0.05	2	-			APHA 4500-P E Method	
	Color	Co.Pt	16.73	-	Max 150			APHA-2120C Method	
	Odor	-	1	-	-			APHA-2150B Method	
	HS	mg/l	0.383	1	Max 1			HACH 8131 Method	
	Oil and Grease	mg/l	< 3.1	10	Max 5			APHA-5520B Method	
	Formaldehyde	mg/l	0.089	-	Max 1			USEPA Method 420.1 Method	
SW-4	Phenols	mg/l	< 0.002	0.5	Max 1			APHA 3120B	
(Reference	Free Chlorine	mg/l	< 0.1	0.2	Max 1		Twice in one	HACH 8131	
Point)	Zinc	mg/l	0.018	2	Max 5		year	APHA-3120B Method	
	Chromium	mg/l	0.028	0.5	Max 0.5			APHA-3120B Method	
	Arsenic	mg/l	0.018	0.1	Max 0.25			APHA-3120B Method	
	Copper	mg/l	≤ 0.002	0.5	Max 1			APHA-3120B Method	
	Mercury	mg/l	≤ 0.002	0.01	Max 0.005			APHA-3120B Method	
	Cadmium	mg/l	≤ 0.001	0.1	Max 0.03			APHA-3120B Method	
	Barium	mg/l	0.05	-	Max 1			APHA-3120B Method	
	Selenium	mg/l	≤ 0.01	0.1	Max 0.02			APHA-3120B Method	
	Lead	mg/l	≤ 0.002	0.1	Max 0.2			APHA-3120B Method	
	Nickel	mg/l	0.038	0.5	Max 0.2			HACH 8027 Method	
	Cyanide	mg/l	0.012	1	Max 1			APHA 4500 CL G Method	
GW-1	Temperature	°C	34.2	None	Max 40			Instrument Analysis Method	
(Reference	pH	-	7.8	(Available	5.0-9.0			Instrument Analysis Method	

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
Point)	SS	mg/l	4	Guideline	Mas 30			APHA 2540D Method	
	DO	mg/l	5.48	value	-	>=4	Twice in one	Instrument Analysis Method	
	BOD	mg/l	2.01	determined by	Max 20		year	APHA-5210B Method	
	COD(Cr)	mg/l	< 0.7	MONREC)	Max 70*4			APHA 5220D Method	
	Total Coliform*6	MPN/100ml	2100		Max 400	7.5×10^3		APHA-9221B Method	
	T-N	mg/l	1.6		Max 80			HACH Method 10072	
	T-P	mg/l	0.089		-			APHA 4500-P E Method	
	Color	Co.Pt	5.43		Max 150			APHA-2120C Method	
	Odor	-	1		-			APHA-2150B Method	
	HS	mg/l	0.007		Max 1			HACH 8131 Method	
	Oil and Grease	mg/l	< 3.1		Max 5			APHA-5520B Method	
	Formaldehyde	mg/l	< 0.003		Max 1			USEPA Method 420.1 Method	
	Phenols	mg/l	0.004		Max 1			APHA 3120B	
	Free Chlorine	mg/l	0.1		Max 1			HACH 8131	
	Zinc	mg/l	≤ 0.002		Max 5			APHA-3120B Method	
	Chromium	mg/l	≤ 0.002		Max 0.5			APHA-3120B Method	
	Arsenic	mg/l	≤ 0.01		Max 0.25			APHA-3120B Method	
	Copper	mg/l	≤ 0.002		Max 1			APHA-3120B Method	
	Mercury	mg/l	≤ 0.002		Max 0.005			APHA-3120B Method	
	Cadmium	mg/l	≤ 0.001		Max 0.03		Twice in one	APHA-3120B Method	
	Barium	mg/l	0.078		Max 1		year	APHA-3120B Method	

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*[1]Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
GW-1	Selenium	mg/l	≤ 0.01		Max 0.02			APHA-3120B Method	
(Reference	Lead	mg/l	≤ 0.002		Max 0.2			APHA-3120B Method	
Point)	Nickel	mg/l	≤ 0.002		Max 0.2			HACH 8027 Method	
	Cyanide	mg/l	< 0.002		Max 1			APHA 4500 CL G Method	

*[1]Remark: Referred to the Vietnam Standard (EIA Report), Reference to the Water Quality Monitoring Report, December 2017.

*[2]Remark: In SW-1, suspended solids are higher than the target value due to the expected reason- i) surface water run-off from bare land in Zone A and ii) influence by water from the downstream of retention pond (SW-1) due to flow back by tidal fluctuation.

*[3]Remark: For reference monitoring points (SW-2, SW-3 and SW-4), the result of suspended solids is higher than the target value due to two expected reason: i) delivered from upstream area such as natural origin and wastewater from the other industrial area outside of Thilawa SEZ and ii) influence by water from downstream of monitoring points due to flow back by tidal fluctuation.

*[4]Remark: In SW-1 and SW-5, Total coliform are higher than the target value due to the expected reason- i) the potential expected reason might natural bacteria existed in all area of Zone A because there are various kinds of vegetation and creature such as birds and small animals in and along the retention canals and retention pond and ii) the second suspect might be influence by water from the downstream of retention pond (SW-1) and retention canal (SW-5) due to flow back by tidal fluctuation.

*[5]Remark: For reference monitoring points (SW-3 and SW-4), the result of total coliform is higher than the target value due to two expected reason: i) natural bacteria existed in discharged creek because there are various kinds of vegetation and creature such as birds, and small animals in and along the discharged creek and ii) wastewater from the local industrial zone outside of Thilawa SEZ.

*[6]Remark: In GW-1, Total coliform are higher than the target value due to the expected reason- i) the poor maintenance of well which can increase the risk of bacteria and other harmful organisms ii) the well was not operated regularly and didn't use for local people long time.

2)(c) Water Quality – February 2018

Measuring Point: Effluent of Wastewater

- Are there any effluents to water body in this monitoring period? ☑ Yes, □ No

If yes, please attach "Analysis Record" and fill in the items not to comply with Refereed International Standard.

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
SW-1	pH*7	-	9.3	6-9	5.0-9.0			Instrument Analysis Method	
	SS*2	ppm	38	50	Max.30			APHA 2540D Method	
	DO	ppm	6.07	-	-	>=4		Instrument Analysis Method	
	COD(Cr)	ppm	17.3	250	Max.70			APHA 5220D Method	
	BOD	ppm	4.1	50	Max.20		Once in two months	APHA-5210B Method	
	T-N	ppm	7.4	-	Max.80			HACH Method 10072	
	T-P	ppm	0.133	2	-			APHA 4500-P E Method	
	Color	Co.Pt	6.81	-	-	7.5×10^3		APHA 2120C Method	
	Odor	Co.Pt	1	-	-			APHA 2150B Method	
	Total coliforms	MPN/100ml	23	400	Max.400			APHA 9221B Method	
SW-5	pH	-	7.9	6-9	5.0-9.0			Instrument Analysis Method	
	SS*2	ppm	50	50	Max.30	>=4		APHA 2540D Method	
	DO	ppm	5.52	-	-			Instrument Analysis Method	
	COD(Cr)	ppm	36.3	250	Max.70		Once in two months	APHA 5220D Method	
	BOD	ppm	5.25	50	Max.20			APHA-5210B Method	
	T-N	ppm	6.4	-	Max.80			HACH Method 10072	
	T-P	ppm	0.345	2	-	7.5×10^3		APHA 4500-P E Method	

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	Color	Co.Pt	51.21	-	-			APHA 2120C Method	
	Odor	Co.Pt	1	-	-			APHA 2150B Method	
	Total coliforms*4	MPN/100ml	> 160,000	400	Max.400			APHA 9221B Method	
SW-6	pH	-	6.3	6-9	5.0-9.0			Instrument Analysis Method	
	SS	ppm	2	50	Max.30			APHA 2540D Method	
	DO	ppm	4.72	-	-			Instrument Analysis Method	
	COD(Cr)	ppm	19.4	250	Max.70			APHA 5220D Method	
	BOD	ppm	0.41	50	Max.20	>=4	Once in two months	APHA-5210B Method	
	T-N	ppm	12.2	-	Max.80			HACH Method 10072	
	T-P	ppm	0.121	2	-			APHA 4500-P E Method	
	Color	Co.Pt	0	-	-			APHA 2120C Method	
	Odor	Co.Pt	1.4	-	-			APHA 2150B Method	
	Total coliforms	MPN/100ml	< 1.8	400	Max.400	7.5×10^3		APHA 9221B Method	
SW-2 (Reference Point)	pH	-	8	6-9	5.0-9.0			Instrument Analysis Method	
	SS*3	ppm	30	50	Max.30			APHA 2540D Method	
	DO	ppm	6.52	-	-	>=4		Instrument Analysis Method	
	COD(Cr)	ppm	24.7	250	Max.70		Once in two months	APHA 5220D Method	
	BOD	ppm	3.13	50	Max.20			APHA-5210B Method	
	T-N	ppm	4.7	-	Max.80			HACH Method 10072	
	T-P	ppm	0.181	2	-			APHA 4500-P E Method	
	Color	Co.Pt	35.63	-	-			APHA 2120C Method	

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	Odor	Co.Pt	2	-	-			APHA 2150B Method	
	Total coliforms*5	MPN/100ml	24,000	400	Max.400			APHA 9221B Method	
SW-3 (Reference Point)	pH	-	7.4	6-9	5.0-9.0	>=4	Once in two months	Instrument Analysis Method	
	SS	ppm	26	50	Max.30			APHA 2540D Method	
	DO	ppm	5.4	-	-			Instrument Analysis Method	
	COD(Cr)	ppm	12.5	250	Max.70			APHA 5220D Method	
	BOD	ppm	2.86	50	Max.20			APHA-5210B Method	
	T-N	ppm	5.3	-	Max.80			HACH Method 10072	
	T-P	ppm	0.4	2	-			APHA 4500-P E Method	
	Color	Co.Pt	10	-	-			APHA 2120C Method	
	Odor	Co.Pt	1	-	-			APHA 2150B Method	
	Total coliforms*5	MPN/100ml	35,000	400	Max.400			APHA 9221B Method	
SW-4 (Reference Point)	pH	-	7.8	6-9	5.0-9.0	>=4	Once in two months	Instrument Analysis Method	
	SS	ppm	8	50	Max.30			APHA 2540D Method	
	DO	ppm	5.94	-	-			Instrument Analysis Method	
	COD(Cr)	ppm	27.1	250	Max.70			APHA 5220D Method	
	BOD	ppm	3.72	50	Max.20			APHA-5210B Method	
	T-N	ppm	4	-	Max.80			HACH Method 10072	
	T-P	ppm	< 0.05	2	-			APHA 4500-P E Method	
	Color	Co.Pt	12.74	-	-			APHA 2120C Method	
	Odor	Co.Pt	1	-	-			APHA 2150B Method	

Location	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	Total coliforms*5	MPN/100ml	160,000	400	Max.400			APHA 9221B Method	
GW-1 (Reference Point)	pH	-	8.2	None (Available Guideline value determined by MONREC)	None (Available Guideline Value determined by MOI)	5.5~9.0	Once in two months	Instrument Analysis Method	
	SS	ppm	2			50		APHA 2540D Method	
	DO	ppm	4.88			>=4		Instrument Analysis Method	
	COD(Cr)	ppm	2.9			60		APHA 5220D Method	
	BOD	ppm	2.56			15		APHA-5210B Method	
	T-N	ppm	0.4			-		HACH Method 10072	
	T-P	ppm	0.079			-		APHA 4500-P E Method	
	Color	Co.Pt	0			-		APHA 2120C Method	
	Odor	Co.Pt	1			-		APHA 2150B Method	
	Total coliforms*6	MPN/100ml	54,000			7.5×10^3		APHA 9221B Method	

1*Remark: Referred to the Vietnam Standard (EIA Report), Reference to the Water Quality Monitoring Report, February 2018.

*2Remark: In SW-1 and SW-5, suspended solids are higher than the standard due to the expected reason- i) surface water run-off from bare land in Zone A and ii) influence by water from the downstream due to flow back by tidal fluctuation.

*3Remark: For reference monitoring points (SW-2, SW-3 and SW-4), the result of suspended solids is higher than the standard due to two expected reason: i) delivered from upstream area such as natural origin and wastewater from the local industrial zone which outside of Thilawa SEZ and ii) delivered from downstream area by tidal effect.

*4Remark: In SW-5, Total coliform are higher than the standard due to the expected reason- the potential expected reason might natural bacteria existed in all area of Zone A because there are various kinds of vegetation and creature such as birds, and small animals in and along the retention canals and retention ponds.

*5Remark: For reference monitoring points (SW-2, SW-3 and SW-4), the result of total coliforms is higher than the standard due to two expected reason: i) runoff of animal waste from the undeveloped area and delivered from local industrial zone and illegal dumping site from outside of Thilawa SEZ in the upstream area and ii) delivered from downstream area by tidal effect.

*6Remark: In GW-1, Total coliform are higher than the target value due to the expected reason- i) the poor maintenance of well which can increase the risk of bacteria and other harmful organisms ii) the well was not operated regularly and didn't use for local people long time

*7Remark: In SW-1, pH is higher than the target value due to the expected reason- i) might be rainwater polluted with concrete washout water discharge from construction sites of Zone A, (ii) might be domestic wastewater discharge that contains detergents and soap-based products.

3) Soil Contamination (only operation phase)

Situations environmental report from tenants

- Are there any serious issues regarding soil contamination in this monitoring period? □ Yes, ☑No

If yes, please describe the contents of complains and its countermeasures to fill in below the table.

Contents of Issues on Soil Contamination	Countermeasures

4) Noise

Remarks: According to EIA report, Chapter 4- Table 4-2.2, monitoring plan is one time each in dry and wet season (First 3 years after operation stage). In the environmental monitoring report (Phase-1, operation phase) No.1, one time noise and vibration monitoring survey is finished as a record and there is no excess the standard in all of survey points. There is not much operation stage industry in current and monitoring will start after consult with environmental expert.

Noise Level (Along the Thilawa Development Road)

Location	Item	Unit	Measured Value (Mean)	Measured Value (Min~Max)	Country's Standard	Target value to be applied	*Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
NV-1	Leq (day)	dB(A)	64	70-55	N/A	75		One time each in dry and wet season	Sound Level Meter	
	Leq(eve)	dB(A)	66	53-70		70				

***Remark: Referred to the Target Noise Standard (Thilawa SEZ Zone-A EIA Report).**

Noise Level (Living Environment)

Location	Item	Unit	Measured Value (Mean)	Measured Value (Min~Max)	Country's Standard	*Target value to be applied	Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
NV-2	Leq (day)	dB(A)	43	38-46	N/A	70		One time each in dry and wet season	Sound Level Meter	
	Leq(eve)	dB(A)	41	40-42		65				
	Leq(night)	dB(A)	37	31-39		60				
NV-3	Leq(day)	dB(A)	45	39-51	N/A	70			Sound level Meter	
	Leq(eve)	dB(A)	48	45-49		65				
	Leq(night)	dB(A)	45	38-49		60				

*Remark: Referred to the Target Noise Standard (Thilawa SEZ Zone-A EIA Report).

Complains from Residents

- Are there any complains from residents regarding noise in this monitoring period? □ Yes, ☑ No

If yes, please describe the contents of complains and its countermeasures to fill in below the table.

Contents of Complains from Residents	Countermeasures

5) Solid Waste (Disposal from admin complex compound)

Measuring Point: Construction Site (Construction Phase), Storage for Sludge (Operation Phase)

- Are there any wastes of sludge in this monitoring period? ☑ Yes, □ No

If yes, please report the amount of sludge and fill in the results of solid waste management Activities.

No.	Date	Description	No. of Kgs	Remarks
1	October 2017	General Waste Disposal	1080	Golden Dowa Eco-system Myanmar Co.,Ltd
2	November 2017	General Waste Disposal	2180	Golden Dowa Eco-system Myanmar Co.,Ltd

No.	Date	Description	No. of Kgs	Remarks
3	December 2017	General Waste Disposal	1260	Golden Dowa Eco-system Myanmar Co.,Ltd
4	January 2018	General Waste Disposal	1400	Golden Dowa Eco-system Myanmar Co.,Ltd
5	February 2018	General Waste Disposal	1720	Golden Dowa Eco-system Myanmar Co.,Ltd
6	March 2018	General Waste Disposal	2020	Golden Dowa Eco-system Myanmar Co.,Ltd

Remark: Attached general waste disposal record (Admin Complex Compound) in appendix.

Remark: Admin complex compound waste disposal reported in the Operation phase, Environmental Monitoring Report because the waste from common area of Thilawa SEZ is storing in the admin complex trash storage. Each locator will submit according to ECPP approval for the waste disposal record directly to the Environmental Section, One Stop Service Center, Thilawa SEZ Management Committee.

6) (a) Ground Subsidence and Hydrology- October 2017

Duration (Week)	Water Consumption		Ground Level		Frequency	Note
	Quantity	Unit	Quantity	Unit		
2-Oct-2017	-	m3/week	+ 7.136	m	Once a week	
9-Oct-2017	-	m3/week	+ 7.136	m		
16-Oct-2017	-	m3/week	+ 7.136	m		
23-Oct-2017	-	m3/week	+ 7.136	m		
30-Oct-2017	-	m3/week	+ 7.136	m		

*** Remarks: Attached ground subsidence monitoring status (Operation Phase) in appendix. There is no ground water consumption in Zone-A industrial area and will monitor and descript the water consumption quantity if using the tube well.**

(b) Ground Subsidence and Hydrology- November 2017

Duration (Week)	Water Consumption		Ground Level		Frequency	Note
	Quantity	Unit	Quantity	Unit		
6-Nov-2017	-	m3/week	+ 7.136	m	Once a week	
13-Nov-2017	-	m3/week	+ 7.136	m		
20-Nov-2017	-	m3/week	+ 7.135	m		
27-Nov-2017	-	m3/week	+ 7.135	m		

* Remarks: Attached ground subsidence monitoring status (Operation Phase) in appendix.

(c) Ground Subsidence and Hydrology- December 2017

Duration (Week)	Water Consumption		Ground Level		Frequency	Note
	Quantity	Unit	Quantity	Unit		
4-Dec-2017	-	m3/week	+ 7.135	m	Once a week	
11-Dec-2017	-	m3/week	+ 7.135	m		
18-Dec-2017	-	m3/week	+ 7.134	m		
26-Dec-2017	-	m3/week	+ 7.134	m		

* Remarks: Attached ground subsidence monitoring status (Operation Phase) in appendix.

(d) Ground Subsidence and Hydrology- January 2018

Duration (Week)	Water Consumption		Ground Level		Frequency	Note
	Quantity	Unit	Quantity	Unit		
2-Jan-2018	-	m3/week	+ 7.134	m	Once a week	
8-Jan-2018	-	m3/week	+ 7.133	m		
15-Jan-2018	-	m3/week	+ 7.133	m		
22-Jan-2018	-	m3/week	+ 7.132	m		
29-Jan-2018	-	m3/week	+ 7.132	m		

* Remarks: Attached ground subsidence monitoring status (Operation Phase) in appendix.

(e) Ground Subsidence and Hydrology- February 2018

Duration (Week)	Water Consumption		Ground Level		Frequency	Note
	Quantity	Unit	Quantity	Unit		
5-Feb-2018	-	m3/week	+ 7.132	m	Once a week	
13-Feb-2018	-	m3/week	+ 7.132	m		
19-Feb-2018	-	m3/week	+ 7.132	m		
26-Feb-2018	-	m3/week	+ 7.132	m		

* Remarks: Attached ground subsidence monitoring status (Operation Phase) in appendix.

(f) Ground Subsidence and Hydrology- March 2018

Duration (Week)	Water Consumption		Ground Level		Frequency	Note
	Quantity	Unit	Quantity	Unit		
5-Mar-2018	-	m3/week	+ 7.132	m	Once a week	
12-Mar-2018	-	m3/week	+ 7.132	m		
19-Mar-2018	-	m3/week	+ 7.132	m		
26-Mar-2018	-	m3/week	+ 7.130	m		

* Remarks: Attached ground subsidence monitoring status (Operation Phase) in appendix.

7) Offensive Odor (only operation phase) Not Applicable at Construction Phase Report

Complaints from Residents

- Are there any complains from residents regarding offensive odor in this monitoring period? □ Yes, ☑No

If yes, please describe the contents of complains and its countermeasures to fill in below the table.

Contents of Complaints from Residents	Countermeasures

Situations environmental report from tenants Not Applicable at Construction Phase Report

- **Are there any serious issues regarding offensive odor in this monitoring period?** □ Yes, ☑No

If yes, please describe the contents of complains and its countermeasures to fill in below the table.

Contents of Issues on Soil Contamination	Countermeasures

8) Infectious disease, Working Environment, Accident

Information from contractor (construction phase) or tenants (operation phase)

- **Are there any incidents regarding Infectious disease, Working Environment, Accident in this monitoring period?** ☑ Yes, □ No

If yes, please describe the contents of complains and its countermeasures to fill in below the table.

Contents of Incidents	Countermeasures
The accident case was happened in 20th October 2017 at in front of plot B-2. A car from plot A-1 was over speeding and drove into canal of Thilawa SEZ property.	MjTD take the action as follow: - Remind to car driver to drive carefully in future and explained the traffic rule to comply
The accident case was happened in 27th November 2017 at in front of plot D-18. A motorbike rider didn't notice a bump with careless driving and slipped and fall down by himself. He got his head minor injured although he wearing helmet.	MjTD take the action as follow: - Remind the motorbike rider to drive carefully in future and to control the motorbike speed for preventing the incident case
The accident case was happened in 2nd December 2017 at in-front of WPP. A truck from plot-A-1 site were hit to the other concrete mixer car from plot D-6+7 site and there is nobody got injury.	MjTD take the action as follow: - Negotiate between two parties - Remind to driver to comply the traffic rule and carefully drive in future
The accident case was occurred in 9th December 2017 at in front of plot D-6+7. A car and motorbike were hit when the car driver turned right. Nobody got the injury.	MjTD take the action as follow: - Remind to carefully drive and comply the traffic rule - Negotiate between two parties and they also taken their responsivities of their damage

Contents of Incidents	Countermeasures
The accident case was happened in 26th December 2017 at in front of plot A-20. The three persons drove the bike with high speed and one of person was drunk alcohol. One person falling from the bike and got minor injured.	MjTD take the action as follow: - Remind to reduce speed and follow the traffic rule
The accident case was occurred in 28th December 2017 at plot C-8. The truck was moving backward and hit the small car and the small car got a little damaged.	MjTD take the action as follow: - Remind to drive carefully and the damaged was negotiated with car insurance company
The accident case was happened in 18th January 2018 at in front of plot C-4. The car was turned left without showing signal and the motor bike hit from the behind. Motorbike person got the minor injured and damaged the both of car and motorbike.	MjTD take the action as follow: - Remind to comply traffic rule to both of car and motor bike driver and carefully drive in future
The accident was occurred in 14th March 2018 at in front of plot B-20. The case is fire case on the light-truck. The driver was carrying the interior decoration glass behind the truck for construction and paper are all together near the glass. The fire started immediately from the paper which is near the decoration glass.	MjTD take the action as follow: - Support to fire fighting and removed all papers from the light truck
The accident was occurred in 31st March 2018 at the junction in front of WPP. Motorbike person turned left at the junction of WPP and hit the car. No one got injury but motorbike and car were damaged.	MjTD take the action as follow: - Negotiation between two parties - Motor bike person also take the responsible for compensation of the damaged - Remind to reduce the speed and to follow up the traffic rule

Note: If emergency incidents are occurred, the information shall be reported to the relevant organizations and authorities immediately.

The above accidents have been reported to One Stop Service Center (OSSC) and Thilawa SEZ Management Committee (TSMC).

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

End of Document

Thilawa Special Economic Zone (Zone A) Development Project (Operation Phase)

Appendix

Water and Waste Water Monitoring Report

October, 2017

WATER QUALITY MONITORING REPORT

FOR DEVELOPMENT OF INDUSTRIAL AREA

IN THILAWA SEZ ZONE A

(OPERATION STAGE)

(Bi-Monthly Monitoring)

October 2017

Myanmar Koei International Ltd.

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CHAPTER 1: INTRODUCTION

1.1 General

Thilawa Special Economic Zone (SEZ) is located in southern district of Yangon region and about 23 km southeast of Yangon city. As the developer of Thilawa SEZ, Myanmar Japan Thilawa Development Ltd. (MJTD) has a responsibility to carry out regular monitoring in the industrial area of Zone A in accordance with the approved Environmental Impact Assessment (EIA) report and Environmental Management Plan (EMP). MJTD has implemented monitoring various environmental items with the specified time frame to know the environmental conditions in and around the area. As for the monitoring of the water quality, total seven sampling points are set for water quality survey, named SW-1, SW-2, SW-3, SW-4, SW-5, SW-6, and GW-1 have been monitored in Thilawa SEZ and its surrounding area in timely manner. Among the seven locations, SW-1 and SW-5 are main discharging points of Thilawa SEZ and SW-6 is discharging from centralized Sewage Treatment Plant (STP) which is required to monitor by Environmental Monitoring Plan (EMoP) in EIA report of Thilawa SEZ Zone A. The remaining points SW-2, SW-3 and SW-4 are sampled as a reference monitoring for comparison with discharging points and baseline of discharged creek. Moreover, GW-1 is monitored as a reference of existing tube well which located in the monastery compound. Location of sampling points for water quality monitoring is shown in Figure 1.1-1.

Figure 1.1- 1 Location of Sampling Points of Water Quality Monitoring

CHAPTER 2: WATER QUALITY MONITORING

2.1 Monitoring Items

Sampling points and parameters for water quality monitoring are determined so as to cover the environmental monitoring plan of the EIA report.

Water quality sampling was carried out at seven locations. Among the seven locations, water flow measurement was carried out at five locations (SW-1, SW-2, SW-5 and SW-6) where can be measured by Current Meter. Monitoring items and sampling points are summarized in Table 2.1-1.

Table 2.1-1 Monitoring Items for Water Quality

No.	Parameters	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	GW-1	Remarks
1	pH	O	O	O	O	O	O	O	On-site measurement
2	Water temperature	O	O	O	O	O	O	O	On-site measurement
3	DO	O	O	O	O	O	O	O	On-site measurement
4	BOD (5)	O	O	O	O	O	O	O	Laboratory analysis
5	COD (Cr)	O	O	O	O	O	O	O	Laboratory analysis
6	Total nitrogen	O	O	O	O	O	O	O	Laboratory analysis
7	Suspended solids	O	O	O	O	O	O	O	Laboratory analysis
8	Total coliform	O	O	O	O	O	O	O	Laboratory analysis
9	Total phosphorous	O	O	O	O	O	O	O	Laboratory analysis
10	Color	O	O	O	O	O	O	O	Laboratory analysis
11	Odor	O	O	O	O	O	O	O	Laboratory analysis
12	Escherichia Coli (Self-monitoring)	O	O	O	O	O	O	O	Laboratory analysis
13	Flow Rate	O	O	–	–	O	O	–	On-site measurement

Source: Myanmar Koei International Ltd.

2.2 Description of Sampling Points

The outline of sampling points is mentioned in Table 2.2-1. The photos of conducting field survey at each sampling points are mentioned in Appendix-1.

Table 2.2-1 Outline of Sampling Points

No.	Station	Detailed Information
1	SW-1	**Coordinate**- N-16° 40' 13.5", E- 96° 16' 39.8"
		Location - Outlet of Retention Pond
		Survey Item – Surface water sampling and water flow rate measurement.
2	SW-2	**Coordinate**- N-16° 40' 20.70", E- 96° 17' 18.70"
		Location - Upstream of Shwe Pyauk Creek
		Survey Item – Surface water sampling and water flow rate measurement.
3	SW-3	**Coordinate**- N-16° 40' 5.50", E- 96° 16' 41.60"
		Location - Upstream of Shwe Pyauk Creek, after mixing point of Thilawa SEZ Zone A and Zone B.
		Survey Item – Surface water sampling.
4	SW-4	**Coordinate**- N-16° 39' 41.52", E- 96° 16' 26.53"
		Location - Downstream of Shwe Pyauk Creek
		Survey Item – Surface water sampling.
5	SW-5	**Coordinate**- N-16° 40' 10.7", E- 96° 16' 22.6"
		Location - Outlet of Retention Canal
		Survey Item – Surface water sampling and water flow rate measurement.
6	SW-6	**Coordinate**- N-16° 40' 26.8", E- 96° 16' 30.7"
		Location - Outlet from STP to Retention Pond
		Survey Item – Surface water sampling and water flow rate measurement.
7	GW-1	**Coordinate**- N-16° 40' 25.10", E- 96° 16' 31.70"
		Location - In Moegyoe Swan Monastery
		Survey Item – Ground Water Sampling

Source: Myanmar Koei International Ltd.

SW-1

SW-1 was collected at the discharge point of retention pond which is located in the east of Moegyoe Swan monastery. This drainage is flowing from north to south and then connected to the Shwe Pyauk creek through earth drain. The water quality of this monitoring point has been influenced by the water from downstream due to flow back by tidal fluctuation. In addition, it seems that a part of wastewater from monastery has reached to the culvert in the SEZ area and discharging to the retention pond.

SW-2 (Reference Point)

SW-2 was collected at the upstream of Shwe Pyauk creek. This sampling point is located at the southeast of Zone A area and at the south of Dagon-Thilawa road. The surrounding area are Zone B in the southwest, local industrial zone in the east and paddy field in the west respectively.

SW-3 (Reference Point)

SW-3 was collected at the upstream of Shwe Pyauk creek after mixing point of Zone A and Zone B, which is flowing from east to west and then entering into the Yangon River. The distance is about 1.2 km downstream of SW-2. This sampling point is located at south of Zone A area and Dagon-Thilawa road. The surrounding area are Zone B in the south, local industrial zone in the east and paddy field in the south and west respectively.

SW-4 (Reference Point)

SW-4 was collected at the downstream of Shwe Pyauk creek, after mixing of discharge water from local industrial zone, construction site of Zone B and Zone A, which is flowing from east to west and then entering into the Yangon River. The distance is about 800 m downstream of SW-3. This sampling point is located at southwest of Zone A area and at the south of Dagon-Thilawa road. The surrounding area are Zone B and local industrial zone in the east and paddy field in the south and west respectively.

SW-5

SW-5 was collected at retention canal near main gate of Thilawa SEZ. Most of the water collected in this canal is rain water and domestic wastewater from surrounding. This canal is also connected to the Shwe Pyauk creek. The water quality of this monitoring point may have been influenced by the water from downstream due to flow back by tidal fluctuation.

SW-6

SW-6 was collected at drain outlet of centralized STP which is located in the north of Moegyoe Swan monastery compound and retention pond (SW-1). Then the treated water is flowing to the retention pond.

GW-1 (Reference of Existing Tube Well)

GW-1 was collected from tube well as ground water sample. It is located in the compound of Moegyoe Swan monastery. The surrounding area are Zone A in the west, retention pond in the east and Dagon-Thilawa road in the south respectively.

2.3 Monitoring Method

All water samples were collected with cleaned sampling bottle and analyzed by the following standard method as shown in Table 2.3-1. All samples were kept in iced boxes keeping at 2-4° C and were transported to the laboratory. Among the parameters; water temperature, pH and DO were measured by the on-site instrument "Horiba, U-52" and water flow rate was also conducted by using the on-site instrument "Tamaya Digital Current Meter".

Table 2.3-1 Analytic Method for Water Quality

No.	Parameter	Method
1	Water Temperature	Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
2	pH	Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
3	Dissolved oxygen (DO)	Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
4	BOD (5)	APHA 5210 B (5 days BOD Test)
5	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)
6	Total nitrogen (T-N)	HACH Method 10072(TNT Persulfate Digestion Method)
7	Suspended solids (SS)	APHA 2540D (Dry at 103-105'C Method)
8	Total coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)
9	Total phosphorous (T-P)	APHA 4500-P E (Ascorbic Acid Method)
10	Color	APHA 2120C (Spectrophotometric Method)
11	Odor	APHA 2150 B (Threshold Odor Test)
12	Escherichia Coli	APHA 9221 F (Escherichia Coli Procedure Using Fluorogenic Substrate)
13	Flow Rate	Detection of Electromagnetic Elements (Real-time measurement by UC-200V Digital Current Meters)

Source: Myanmar Koei International Ltd.

2.4 Monitoring Period

Water quality and water flow rate monitoring were conducted on 24th October 2017 and sampling time is shown in Table 2.4-1 to avoid tidal effect. The tide record for Yangon River, Myanmar on 24th October 2017 is shown in Table 2.4-2.

Table 2.4-1 Sampling Time of Each Station

No.	Station	Sampling Time
1	SW-1	24/10/2017 14:39
2	SW-2	24/10/2017 09:03
3	SW-3	24/10/2017 11:05
4	SW-4	24/10/2017 11:50
5	SW-5	24/10/2017 15:04
6	SW-6	24/10/2017 14:13
7	GW-1	24/10/2017 15:35

Source: Myanmar Koei International Ltd.

Table 2.4-2 Tide Record for Yangon River, Myanmar

Date	Time	Height	Tide Conditions
24/10/2017	01:48	1.02	Low Tide
	06:35	5.87	High Tide
	14:22	0.93	Low Tide
	18:57	5.45	High Tide

Source: Myanmar Port Authority, Tide Table for the Yangon River and Elephant Point, 2017.

2.5 Monitoring Results

Results of water quality monitoring are summarized in Table 2.5-1. Analytical results of the laboratory are described in Appendix-2. The results were compared with the target value of effluent water quality discharging to water body stipulated in the EIA report.

2.5.1 Results of Water Quality at the Outlet of Sewage Treatment Plant of industrial Area of Thilawa SEZ and at the Point before discharging to Creek

As the comparison with the target value, the results of suspended solid (SS), total coliform were exceeded than the target values. As for the result of SS, the result at the outlet of the centralized STP (SW-6) complied with the target value. It implied that effluents from each locator were treated well by the STP. On the other hand, results at the monitoring points of retention pond (SW-1) and retention canal (SW-5) before discharging to creek, exceeded the target value due to the expected reasons; i) surface water run-off from bare land in Zone A and ii) influence by water from the downstream of retention pond (SW-1) and retention canal (SW-5) due to flow back by tidal fluctuation.

As for the result of total coliform of surface water, the result at the outlet of the centralized STP (SW-6) also complied with the target value. It may prove that effluents from each locator was treated well by the STP. On the other hand, results at the monitoring points of retention pond (SW-1) and retention canal (SW-5) exceeded the target value due to the expected reasons; i) the potential expected reason might natural bacteria existed in all area of Zone A because there are various kinds of vegetation and creature such as birds, and small animals in and along the retention canals and retention ponds and ii) the second suspect might be influence by water from the downstream of retention pond (SW-1) and retention canal (SW-5) due to flow back by tidal fluctuation.
Since the composition of the total coliform include bacteria from natural origin, and even after Total Coliform do not affect human health directly, self-monitoring for E. Coli analysis was carried out to identify health impact by coliform bacteria. As for the result of E.Coli of surface water, all of results were under the reference value. Therefore, although the target value of total coliform was exceeded at monitoring point of retention pond (SW-1) and retention canal (SW-5), but it is considered that there is no significant impact on human health.

In the first place, the monitoring points of retention pond (SW-1) and retention canal (SW-5) should be changed to a little upstream where are possible to avoid flow back by tidal fluctuation in order to evaluate the impact on water quality from the industrial area of Zone A to public water body.

On the bases of the above examinations, the following actions shall be taken to control SS and total coliform;

- To continue the self-monitoring for E. Coli level to identify health impact by coliform bacteria (While result of Total coliform are exceeded the target value)

Perhaps, the possibility that water in the retention pond might include overflowed water from some construction sites with insufficient treatment of coliform should not be excluded from the possible cause.

Table 2.5-1 Results of Water Quality Monitoring at Main Discharging Gates and Discharged from Centralized STP

No.	Parameters	Unit	SW-1	SW-5	SW-6	Target Value (Reference Value for Self-Monitoring)
1	Temperature	°C	31.3	30.6	30.3	Max. 40.0
2	pH	-	8.9	8.8	6.8	5.0~9.0
3	Suspended solid (SS)	mg/L	114	414	4	Max. 30
4	Dissolved oxygen (DO)	mg/L	6.8	5.4	7.3	-
5	BOD (5)	mg/L	12.91	4.82	2.62	Max. 20.00
6	COD (Cr)	mg/L	11.6	8.1	5.7	Max. 70.0
7	Total coliform	MPN/ 100ml	24,000	>160,000	<1.8	Max. 400
8	Total nitrogen (T-N)	mg/L	2.0	6.0	4.0	80.0
9	Total phosphorous (T-P)	mg/L	0.27	0.352	<0.05	-
10	Color	TCU (True Color Unit)	9.67	7.96	0.00	-
11	Odor	TON (Threshold Odor Number)	1	1	1.4	-
12	Escherichia Coli	MPN/100ml	4.0	< 1.8	< 1.8	(1,000)* (CFU/100ml)
13	Flow Rate	m^3/s	0.025	0.024	0.021	-

Note: Red color means exceeded value than target value.

*Note: Based on the water utilization at discharged creek, water quality C of quality standard for water baths in Japan, (Ministry of Environment, 1997) is set as a reference value for self-monitoring of E. coli for surface water monitoring. However, due to limitation of capacity for analytical laboratory in Myanmar, the method to analyze the "Colony Forming Unit (CFU)" is not available in Myanmar. Therefore, the results of "Most Probable Number (MPN)" are assumed similar to CFU values and compared with reference values. Once the method to analyze the CFU will be available in Myanmar, the analytical method will be changed.

According to the quality standard for water baths in Japan, (Ministry of Environment, 1997), in case of E.Coli result is exceeding 1,000 CFU/100 ml, since it is assumed unsafety, it is considered unsuitable for water baths.

Source: Myanmar Koei International Ltd.

2.5.2 Results of Reference Monitoring for Comparison with Discharging Points and Baseline of Discharged Creek

Results of water quality monitoring are summarized in Table 2.5-2. The results were compared with the target value of effluent water quality discharging to water body stipulated in the EIA report.

As the comparison with the target value, the results of SS and total coliform were exceeded than the target value. As for the result of SS, results at the surface water monitoring points (SW-2, SW-3 and SW-4) exceeded the target value due to two expected reasons; i) delivered from upstream area such as natural origin and wastewater from local industrial zone which outside of Thilawa SEZ, and ii) delivered from surrounding area by tidal effect.

As for the result of total coliform of surface water, results at the other surface water monitoring points (SW-2, SW-3 and SW-4) exceeded the target value due to two expected reasons; i) runoff of animal waste from the undeveloped area and delivered from local industrial zone and illegal dumping site from outside of Thilawa SEZ in the upstream area, and ii) delivered from surrounding area by tidal effect. In addition, the result of E.Coli of surface water, all of results were under the reference value. Therefore, although the target

value of total coliform was exceeded at monitoring point of SW-2, SW-3 and SW-4, but it is considered that there is no significant impact on human health.

As for the result of total coliform in ground water, result at GW-1 (ground water in Moegyoe Swan monastery) is not exceeded the target value.

Table 2.5-2 Result of Water Quality Monitoring for Reference Monitoring Points for Comparison with Discharging Points and Baseline of Discharged Creek

No.	Parameters	Unit	SW-2	SW-3	SW-4	GW-1	Target Value (Reference Value for Self-Monitoring)
1	Temperature	°C	29.5	29.9	29.6	34.3	Max. 40.0
2	pH	-	7.4	7.4	7.2	7.9	5.0~9.0
3	Suspended solid (SS)	mg/L	36	110	92	6	Max. 30
4	Dissolved oxygen (DO)	mg/L	3.7	6.9	6.9	5.9	-
5	BOD (5)	mg/L	3.51	3.68	5.28	8.50	Max. 20.00
6	COD (Cr)	mg/L	12.4	9.7	9.6	5.5	Max. 70.0
7	Total coliform	MPN/ 100ml	>160,000	160,000	160,000	23	Max. 400
8	Total nitrogen (T-N)	mg/L	0.7	2.6	1.2	2.0	80.0
9	Total phosphorous (T-P)	mg/L	0.122	0.218	0.182	0.075	-
10	Color	TCU (True Color Unit)	21.28	11.41	9.36	0.44	-
11	Odor	TON (Threshold Odor Number)	1	1	1	1	-
12	Escherichia Coli	MPN/100 ml* (SW)	< 1.8	1.8	< 1.8		(1,000)* (CFU/100ml)
		MPN/100 ml** (GW)				< 1.8	(100)** (MPN/100ml)
13	Flow Rate	m^3/s	0.66	-	-	-	-

Note: Red colors means exceeded value than target value.

*Note: Based on the water utilization at discharged creek, water quality C of the quality standard for water baths in Japan, (Ministry of Environment, 1997) is set as a reference value of self-monitoring for surface water monitoring. However, due to limitation of capacity for analytical laboratory in Myanmar, the method to analyze the "Colony Forming Unit (CFU)" is not available in Myanmar. Therefore, the results of "Most Probable Number (MPN)" are assumed similar to CFU values and compared with reference values. Once the method to analyze the CFU will be available in Myanmar, the analytical method will be changed.

According to the quality standard for water baths in Japan, (Ministry of Environment, 1997), in case of E.Coli result is exceeding 1,000 CFU/100 ml, since it is assumed unsafety, it is considered unsuitable for water baths.

**Note: Based on the water utilization at monitoring point for ground water, B1(Irrigation water) of National Technical Regulation on Surface Water Quality in Vietnam (No. QCVN 08: 2008/BTNMT) is set as a reference value of self-monitoring for ground water monitoring.

Source: Myanmar Koei International Ltd.

CHAPTER 3: CONCLUSION AND RECOMMENDATIONS

As for the result of SS and total coliform the results at the outlet of the centralized STP (SW-6) complied with the target value of both of them. It may prove that effluent from each locator was treated well by the STP. On the other hand, parameters of SS and total coliform at retention pond (SW-1) and parameters of SS, total coliform at retention canal (SW-5) were exceeded the target values in this period for main discharging points of Thilawa SEZ Zone A. However, as mentioned in Section 2.5.1, in the first place, the monitoring points of retention pond (SW-1) and retention canal (SW-5) should be changed to a little upstream where are possible to avoid flow back by tidal fluctuation in order to evaluate the impact on water quality from the industrial area of Zone A to public water body. In addition, according to the result of self-monitoring of E. coli at retention pond (SW-1) and retention canal (SW-5), results were under the reference value. Therefore, although the target value of total coliform was exceeded at monitoring point SW-1 and SW-5, but it is considered that there is no significant impact on human health.

As for parameters of SS and total coliform in surface water were exceeded the target values at reference monitoring points. As mentioned in Section 2.5.2, the result of self-monitoring of E. coli at SW-2, SW-3, SW-4 and GW-1 were under the reference value. Therefore, although the target value of total coliform was exceeded at reference monitoring point, but it is considered that there is no significant impact on human health. The expected reasons for exceeding the target values of Total coliform are by natural origin (natural bacteria existed). However, it cannot reach to the conclusion of what is the reason to be exceeded the target values, thus the continuous monitoring and yearly trend analysis will be necessary based on the wet and dry season data.

As for future subject for main discharging points of Thilawa SEZ Zone A, the following action may be taken to achieve the target levels and appropriate water quality monitoring:

- To monitor Escherichia coli (E. coli) level to identify health impact by coliform bacteria; and
- To examine the possibility of the overflow water from construction sites.
- To examine the possibility of the domestic wastewater from construction sites.

End of the Document

APPENDIX-1 FIELD SURVEY PHOTOS

FOR DISCHARGING POINTS OF THILAWA SEZ ZONE A

Surface water sampling and onsite measurement at SW-1

Surface water sampling and onsite measurement at SW-5

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Surface water sampling and onsite measurement at SW-6

FOR REFERENCE MONITORING POINTS FOR COMPARISON WITH DISCHARGING POINTS AND BASELINE OF DISCHARGED CREEK

Surface water sampling and onsite measurement at SW-2

Surface water sampling and onsite measurement at SW-3

Surface water sampling and onsite measurement at SW-4

Ground water sampling and onsite measurement at GW-1

APPENDIX-2 LABORATORY RESULTS

FOR DISCHARGING POINTS AND AFTER CENTRALIZED STP

DOWA

GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.
Lot No. E1, ThilawaSEZ Zone A, Yangon Region, the Union of Myanmar
Tel 01-2309051/ 09 796935149

Report No. : GEM-LAB-201711057
Revision No. : 1
Report Date : 9 November, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-1-1024 Sampling Date : 24 October, 2017
Sample No. : W-1710153 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 24 October, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105°C Method)	mg/l	114.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	12.91	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	11.6	0.7
4	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	2.0	0.0
5	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.27	0.05
6	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	24000	1.8
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	9.67	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	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

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Report No. : GEM-LAB-201711058
Revision No. : 1
Report Date : 9 November, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-5-1024 Sampling Date : 24 October, 2017
Sample No. : W-1710154 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 24 October, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	414.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	4.82	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	8.1	0.7
4	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	6.0	0.0
5	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.352	0.05
6	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	> 160000	1.8
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	7.96	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	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

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Report No. : GEM-LAB-201711059
Revision No. : 1
Report Date : 9 November, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-6-1024 Sampling Date : 24 October, 2017
Sample No. : W-1710155 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 24 October, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	4.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	2.62	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	5.7	0.7
4	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	4.0	0.0
5	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	< 0.05	0.05
6	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	< 1.8	1.8
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	0.00	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1.4	-

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

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FOR REFERENCE MONITORING POINTS FOR COMPARISON WITH DISCHARGING POINTS AND BASELINE OF DISCHARGED CREEK

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Report No. : GEM-LAB-201711060
Revision No. : 1
Report Date : 9 November, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-2-1024 Sampling Date : 24 October, 2017
Sample No. : W-1710156 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 24 October, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	36.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	3.51	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	12.4	0.7
4	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	0.7	0.0
5	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.122	0.05
6	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	> 160000	1.8
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	21.28	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	-
9	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	3.40	3.1
10	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002

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

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Tel:01-2309051/ 09 796935149

Report No. : GEM-LAB-201711061
Revision No. : 1
Report Date : 9 November, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-3-1024 Sampling Date : 24 October, 2017
Sample No. : W-1710157 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 24 October, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	110.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	3.68	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	9.7	0.7
4	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	2.6	0.0
5	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.218	0.05
6	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	160000	1.8
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	11.41	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	-
9	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
10	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.004	0.002

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

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Report No. : GEM-LAB-201711062
Revision No. : 1
Report Date : 9 November, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-4-1024 — Sampling Date : 24 October, 2017
Sample No. : W-1710158 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 24 October, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	92.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	5.28	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	9.6	0.7
4	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	1.2	0.0
5	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.182	0.05
6	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	160000	1.8
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	9.36	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	-
9	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
10	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002

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

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Report No. : GEM-LAB-201711066
Revision No. : 1
Report Date : 9 November, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-GW-1-1024 Sampling Date : 24 October, 2017
Sample No. : W-1710162 Sampling By : Customer
Waste Profile No : - Sample Received Date : 24 October, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	6.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	8.50	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	5.5	0.7
4	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	2.0	0.0
5	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.075	0.05
6	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	23	1.8
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	0.44	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	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

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APPENDIX-3 LABORATORY RESULT OF ESCHERICHIA COLI (SELF-MONITORING)

FOR DISCHARGING POINTS AND AFTER CENTRALIZED STP

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Lot No. E1, ThilawaSEZ Zone A, Yangon Region, the Union of Myanmar
Tel 01-2309051, 09 796935149

Report No. : GEM-LAB-201711019
Revision No. : 1
Report Date : 8 November, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-1-1024 — Sampling Date : 24 October, 2017
Sample No. : W-1710164 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 24 October, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	4.0	1.8

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

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Tel:01-2309051 09 796935149

Report No. : GEM-LAB-201711020
Revision No. : 1
Report Date : 8 November, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-S-1024 Sampling Date : 24 October, 2017
Sample No. : W-1710165 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 24 October, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	< 1.8	1.8

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

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Tel 01-2309051, 09 796935149

Report No. : GEM-LAB-201711021
Revision No. : 1
Report Date : 8 November, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-6-1024 — Sampling Date : 24 October, 2017
Sample No. : W-1710166 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 24 October, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	< 1.8	1.8

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

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FOR REFERENCE MONITORING POINTS FOR COMPARISON WITH DISCHARGING POINTS AND BASELINE OF DISCHARGED CREEK

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GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD
Lot No. E1, ThilawaSEZ Zone A, Yangon Region, the Union of Myanmar
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Report No. : GEM-LAB-201711022
Revision No. : 1
Report Date : 8 November, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-2-1024 — Sampling Date : 24 October, 2017
Sample No. : W-1710167 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 24 October, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	< 1.8	1.8

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

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Tel 01-2309051, 09 796935149

Report No. : GEM-LAB-201711023
Revision No. : 1
Report Date : 8 November, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-3-1024 — Sampling Date : 24 October, 2017
Sample No. : W-1710168 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 24 October, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	1.8	1.8

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

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Report No. : GEM-LAB-201711024
Revision No. : 1
Report Date : 8 November, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-4-1024 — Sampling Date : 24 October, 2017
Sample No. : W-1710169 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 24 October, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	< 1.8	1.8

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

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Tel 01-2309051, 09 796935149

Report No. : GEM-LAB-201711028
Revision No. : 1
Report Date : 8 November, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-GW-1-1024 Sampling Date : 24 October, 2017
Sample No. : W-1710173 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 24 October, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	< 1.8	1.8

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

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Thilawa Special Economic Zone (Zone A) Development Project (Operation Phase)

Appendix

Water and Waste Water Monitoring Report

December, 2017

WATER QUALITY MONITORING REPORT

FOR DEVELOPMENT OF INDUSTRIAL AREA

IN THILAWA SEZ ZONE A

(OPERATION STAGE)

(Bi-Annually Monitoring)

December 2017

Myanmar Koei International Ltd.

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED
MJTD

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CHAPTER 1: INTRODUCTION

1.1 General

Thilawa Special Economic Zone (SEZ) is located in southern district of Yangon region and about 23 km southeast of Yangon city. As the developer of Thilawa SEZ, Myanmar Japan Thilawa Development Ltd. (MJTD) has a responsibility to carry out regular monitoring in the industrial area of Zone A in accordance with the approved Environmental Impact Assessment (EIA) report and Environmental Management Plan (EMP). MJTD has implemented monitoring various environmental items with the specified time frame to know the environmental conditions in and around the area. As for the monitoring of the water quality, total seven sampling points are set for water quality survey, named SW-1, SW-2, SW-3, SW-4, SW-5, SW-6, and GW-1 have been monitored in Thilawa SEZ and its surrounding area in timely manner. Among the seven locations, SW-1, SW-5 are main discharging points of Thilawa SEZ and SW-6 is discharging from centralized Sewage Treatment Plant (STP) which is required to monitor by Environmental Monitoring Plan (EMoP) in EIA report of Thilawa SEZ Zone A. The remaining points SW-2, SW-3 and SW-4 are sampled as a reference monitoring for comparison with discharging points and baseline of discharged creek. Moreover, GW-1 is monitored as a reference of existing tube well which located in the monastery compound. Location of sampling points for water quality monitoring is shown in Figure 1.1-1.

Figure 1.1- 1 Location of Sampling Points of Water Quality Monitoring

CHAPTER 2: WATER QUALITY MONITORING

2.1 Monitoring Items

Sampling points and parameters for water quality monitoring are determined so as to cover the environmental monitoring plan of the EIA report.

Water quality sampling was carried out at seven locations. Among the seven locations, water flow measurement was carried out at five locations (SW-1, SW-2, SW-5 and SW-6) where can be measured by Current Meter. Monitoring items and sampling points are summarized in Table 2.1-1.

Table 2.1-1 Monitoring Items for Water Quality

No.	Parameters	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	GW-1	Remarks
1	pH	O	O	O	O	O	O	O	On-site measurement
2	Water temperature	O	O	O	O	O	O	O	On-site measurement
3	DO	O	O	O	O	O	O	O	On-site measurement
4	BOD (5)	O	O	O	O	O	O	O	Laboratory analysis
5	COD (Cr)	O	O	O	O	O	O	O	Laboratory analysis
6	Total nitrogen	O	O	O	O	O	O	O	Laboratory analysis
7	Suspended solids	O	O	O	O	O	O	O	Laboratory analysis
8	Total coliform	O	O	O	O	O	O	O	Laboratory analysis
9	Total phosphorous	O	O	O	O	O	O	O	Laboratory analysis
10	Color	O	O	O	O	O	O	O	Laboratory analysis
11	Odor	O	O	O	O	O	O	O	Laboratory analysis
12	Oil and Grease	O	O	O	O	O	O	O	Laboratory analysis
13	Mercury	O	O	O	O	O	O	O	Laboratory analysis
14	Zinc	O	O	O	O	O	O	O	Laboratory analysis
15	Arsenic	O	O	O	O	O	O	O	Laboratory analysis
16	Chromium	O	O	O	O	O	O	O	Laboratory analysis
17	Cadmium	O	O	O	O	O	O	O	Laboratory analysis
18	Selenium	O	O	O	O	O	O	O	Laboratory analysis
19	Lead	O	O	O	O	O	O	O	Laboratory analysis
20	Copper	O	O	O	O	O	O	O	Laboratory analysis
21	Barium	O	O	O	O	O	O	O	Laboratory analysis
22	Nickel	O	O	O	O	O	O	O	Laboratory analysis
23	Cyanide	O	O	O	O	O	O	O	Laboratory analysis
24	Free Chlorine	O	O	O	O	O	O	O	Laboratory analysis
25	Sulphide	O	O	O	O	O	O	O	Laboratory analysis
26	Formaldehyde	O	O	O	O	O	O	O	Laboratory analysis
27	Phenol	O	O	O	O	O	O	O	Laboratory analysis
28	Escherichia Coli (Self- monitoring)	O	O	O	O	O	O	O	Laboratory analysis
29	Flow Rate	O	O	–	–	O	O	–	On-site measurement

Source: Myanmar Koei International Ltd.

2.2 Description of Sampling Points

The outline of sampling points is mentioned in Table 2.2-1. The photos of conducting field survey at each sampling points are mentioned in Appendix-1.

Table 2.2-1 Outline of Sampling Points

No.	Station	Detailed Information
1	SW-1	**Coordinate**- N-16° 40' 13.5", E- 96° 16' 39.8"
		Location - Outlet of Retention Pond
		Survey Item – Surface water sampling and water flow rate measurement.
2	SW-2	**Coordinate**- N-16° 40' 20.70", E- 96° 17' 18.70"
		Location - Upstream of Shwe Pyauk Creek
		Survey Item – Surface water sampling and water flow rate measurement.
3	SW-3	**Coordinate**- N-16° 40' 5.50", E- 96° 16' 41.60"
		Location - Upstream of Shwe Pyauk Creek, after mixing point of Thilawa SEZ Zone A and Zone B.
		Survey Item – Surface water sampling.
4	SW-4	**Coordinate**- N-16° 39' 41.52", E- 96° 16' 26.53"
		Location - Downstream of Shwe Pyauk Creek
		Survey Item – Surface water sampling.
5	SW-5	**Coordinate**- N-16° 40' 10.7", E- 96° 16' 22.6"
		Location - Outlet of Retention Canal
		Survey Item – Surface water sampling and water flow rate measurement.
6	SW-6	**Coordinate**- N-16° 40' 26.8", E- 96° 16' 30.7"
		Location - Outlet from STP to Retention Pond
		Survey Item – Surface water sampling and water flow rate measurement.
7	GW-1	**Coordinate**- N-16° 40' 25.10", E- 96° 16' 31.70"
		Location - In Moegyoe Swan Monastery
		Survey Item – Ground Water Sampling

Source: Myanmar Koei International Ltd.

SW-1

SW-1 was collected at the discharge point of retention pond which is located in the east of Moegyoe Swan monastery. This drainage is flowing from north to south and then connected to the Shwe Pyauk creek through earth drain. The water quality of this monitoring point has been influenced by the water from downstream due to flow back by tidal fluctuation. In addition, it seems that a part of wastewater from monastery has reached to the culvert in the SEZ area and discharging to the retention pond.

SW-2 (Reference Point)

SW-2 was collected at the upstream of Shwe Pyauk creek. This sampling point is located at the northeast of Zone B area and at the south of Dagon-Thilawa road. The surrounding area are Zone A in the northwest, local industrial zone in the east and paddy field in the west respectively.

SW-3 (Reference Point)

SW-3 was collected at the Shwe Pyauk creek, after mixing point of Zone A and Zone B, which is flowing from east to west and then entering into the Yangon river. The distance is about 1.2 km downstream of SW-2. This sampling point is located at south of Zone A area and Dagon-Thilawa road. The surrounding area are Zone B in the south, local industrial zone in the east and paddy field in the south and west respectively.

SW-4 (Reference Point)

SW-4 was collected at the downstream of Shwe Pyauk creek, after mixing of discharged water from local industrial zone, construction site of Zone B and Zone A, which is flowing from east to west and then entering into the Yangon river. The distance is about 800 m downstream of SW-3. This sampling point is located at southwest of Zone A area and at the south of Dagon-Thilawa road. The surrounding area are Zone B and local industrial zone in the east and paddy field in the south and west respectively.

SW-5

SW-5 was collected at retention canal near main gate of Thilawa SEZ. Most of the water collected in this canal is rain water and domestic wastewater from surrounding. This canal is also connected to the Shwe Pyauk creek. The water quality of this monitoring point may have been influenced by the water from downstream due to flow back by tidal fluctuation.

SW-6

SW-6 was collected at drain outlet of centralized STP which is located in the north of Moegyoe Swan monastery compound and retention pond (SW-1). Then the treated water is flowing to the retention pond.

GW-1 (Reference of Existing Tube Well)

GW-1 was collected from tube well as ground water sample. It is located in the compound of Moegyoe Swan monastery. The surrounding area are Zone A in the west, retention pond in the east and Dagon-Thilawa road in the south respectively.

2.3 Monitoring Method

All water samples were collected with cleaned sampling bottle and analyzed by the following standard method as shown in Table 2.3-1. All samples were kept in iced boxes keeping at 2-4° C and were transported to the laboratory. Among the parameters; water temperature, pH and DO were measured by the on-site instrument "Horiba, U-52" and water flow rate was also conducted by using the on-site instrument "Tamaya Digital Current Meter".

Table 2.3-1 Analytic Method for Water Quality

No.	Parameter	Method
1	Temperature	Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
2	pH	Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
3	Suspended solids (SS)	APHA 2540D (Dry at 103-105'C Method)
4	Dissolved oxygen (DO)	Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
5	BOD (5)	APHA 5210 B (5 days BOD Test)
6	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)
7	Total coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)
8	Total nitrogen (T-N)	HACH Method 10072(TNT Persulfate Digestion Method)
9	Total phosphorous (T-P)	APHA 4500-P E (Ascorbic Acid Method)
10	Color	APHA 2120C (Spectrophotometric Method)
11	Odor	APHA 2150 B (Threshold Odor Test)
12	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)
13	Mercury	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
14	Zinc	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
15	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
16	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
17	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
18	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
19	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
20	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
21	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
22	Nickel	HACH 8027 (Pyridine – Pyrazoline Method)
23	Cyanide	APHA 4500 CL G (DPD Colorimetric Method)
24	Free Chlorine	HACH 8131 (USEPA Methylene Blue Method)
25	Sulphide	HACH 8110 (MBTH Method)
26	Formaldehyde	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4AAP With Distillation))
27	Phenol	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)
28	Escherichia Coli	APHA 9221 F (Escherichia Coli Procedure Using Fluorogenic Substrate)
29	Flow Rate	Detection of Electromagnetic Elements (Real-time measurement by UC-200V Digital Current Meters)

Source: Myanmar Koei International Ltd.

2.4 Monitoring Period

Water quality and water flow rate monitoring were conducted on 5th December 2017 and sampling time is shown in Table 2.4-1 to avoid tidal effect. The tide record for Yangon river, Myanmar on 5th December 2017 is shown in Table 2.4-2.

Table 2.4-1 Sampling Time of Each Station

No.	Station	Sampling Time
1	SW-1	5/12/2017 14:49
2	SW-2	5/12/2017 11:31
3	SW-3	5/12/2017 09:09
4	SW-4	5/12/2017 10:27
5	SW-5	5/12/2017 15:20
6	SW-6	5/12/2017 14:26
7	GW-1	5/12/2017 15:50

Source: Myanmar Koei International Ltd.

Table 2.4-2 Tide Record for Yangon River, Myanmar

Date	Time	Height	Tide Conditions
5/12/2017	00:28	0.46	Low Tide
	05:00	6.19	High Tide
	13:16	0.38	Low Tide
	17:28	5.75	High Tide

Source: Myanmar Port Authority, Tide Table for the Yangon River and Elephant Point, 2017.

2.5 Monitoring Results

Results of water quality monitoring are summarized in Table 2.5-1. Analytical results of the laboratory are described in Appendix-2. The results were compared with the target value of effluent water quality discharging to water body stipulated in the EIA report.

2.5.1 Results of Water Quality at the Outlet of Sewage Treatment Plant of industrial Area of Thilawa SEZ and at the Point before discharging to Creek

As the comparison with the target value, the results of suspended solid (SS) and total coliform were exceeded than the target value. As for the result of SS, the result at the outlet of the centralized STP (SW-6) and retention canal (SW-5) complied with the target value. It implied that effluents from each locator were treated well by the STP. On the other hand, results at the monitoring points of retention pond (SW-1) and reference point (SW-2), (SW-3), (SW-4), exceeded the target value due to the expected reasons; i) surface water run-off from bare land in Zone A and ii) influence by water from the downstream of retention pond (SW-1) due to flow back by tidal fluctuation.

As for the result of total coliform of surface water, the result at the outlet of the centralized STP (SW-6) also complied with the target value. It may prove that effluents from each locator were treated well by the STP. On the other hand, results at the monitoring points of retention pond (SW-1) and retention canal (SW-5) exceeded the target value due to the expected reasons; i) the potential expected reason might natural bacteria existed in all area of Zone A because there are various kinds of vegetation and creature such as birds, and small animals in and along the retention canals and retention ponds and ii) the second suspect

might be influence by water from the downstream of retention pond (SW-1) and retention canal (SW-5) due to flow back by tidal fluctuation.
Since the composition of the total coliform include bacteria from natural origin, and even after Total Coliform do not affect human health directly, self-monitoring for E. Coli analysis was carried out to identify health impact by coliform bacteria. As for the result of E. Coli of surface water, all of results were under the reference value. Therefore, although the target value of total coliform was exceeded at monitoring point of retention pond (SW-1) and retention canal (SW-5), but it is considered that there is no significant impact on human health.

In the first place, the monitoring points of retention pond (SW-1) retention canal (SW-5) should be changed to a little upstream where are possible to avoid flow back by tidal fluctuation in order to evaluate the impact on water quality from the industrial area of Zone A to public water body.

On the bases of the above examinations, the following actions shall be taken to control SS and total coliform;

- To continue the self-monitoring for Escherichia coli (E. Coli) level to identify health impact by coliform bacteria (While result of Total Coliform are exceeded the target value)

Perhaps, the possibility that water flowing through the retention canals might include overflowed water from some construction sites with insufficient treatment of coliform should not be excluded from the possible cause.

Table 2.5-1 Results of Water Quality Monitoring at Main Discharging Gates and Discharged from Centralized STP

No.	Parameters	Unit	SW-1	SW-5	SW-6	Target Value (Reference Value for Self-Monitoring)
1	Temperature	°C	33.6	32.1	28.8	Max. 40.0
2	pH	-	8.2	8.0	7.2	5.0~9.0
3	Suspended solid (SS)	mg/L	226	26	2	Max. 30
4	Dissolved oxygen (DO)	mg/L	6.17	4.37	7.33	-
5	BOD (5)	mg/L	8.76	7.58	2.17	Max. 20.00
6	COD (Cr)	mg/L	9.0	11.6	4.9	Max. 70.0
7	Total coliform	MPN/ 100ml	92,000	> 160,000	< 1.8	Max. 400
8	Total nitrogen (T-N)	mg/L	4.9	1.1	11.1	80.0
9	Total phosphorous (T-P)	mg/L	< 0.05	0.073	< 0.05	-
10	Color	TCU (True Color Unit)	10.74	13.62	6.81	-
11	Odor	TON (Threshold Odor Number)	1	1	1	-
12	Oil and Grease	mg/L	< 3.1	< 3.1	< 3.1	Max. 5
13	Mercury	mg/L	≤0.002	≤0.002	≤0.002	Max. 0.005
14	Zinc	mg/L	0.01	≤0.002	≤0.002	Max. 5.000
15	Arsenic	mg/L	0.014	0.012	≤0.01	Max. 0.25
16	Chromium	mg/L	0.018	≤0.002	≤0.002	Max. 0.500
17	Cadmium	mg/L	≤0.001	≤0.001	≤0.001	Max. 0.030
18	Selenium	mg/L	≤0.01	≤0.01	≤0.01	Max. 0.02
19	Lead	mg/L	≤0.002	0.018	≤0.002	Max. 0.200
20	Copper	mg/L	≤0.002	≤0.002	≤0.002	Max. 1.000
21	Barium	mg/L	0.052	0.032	0.008	Max. 1.000
22	Nickel	mg/L	0.03	0.004	0.01	Max. 0.200
23	Cyanide	mg/L	0.030	0.002	< 0.002	Max. 0.200
24	Free Chlorine	mg/L	0.1	< 0.1	0.1	Max. 1.0
25	Sulphide	mg/L	0.248	0.046	< 0.005	Max. 1.000
26	Formaldehyde	mg/L	0.050	0.017	0.024	Max. 1.000
27	Phenol	mg/L	< 0.002	< 0.002	< 0.002	Max. 1.000
28	Escherichia Coli	MPN/100ml (SW)	5.5	3.6	< 1.8	(1000)* (CFU/100ml)
29	Flow Rate	m^3/s	0.097	0.006	0.012	-

Note: Red color means the exceeded value than target value.

*Note: Based on the water utilization at discharged creek, water quality C of quality standard for water baths in Japan, (Ministry of Environment, 1997) is set as a reference value for self-monitoring of E. coli for surface water monitoring. However, due to limitation of capacity for analytical laboratory in Myanmar, the method to analyze the "Colony Forming Unit (CFU)" is not available in Myanmar. Therefore, the results of "Most Probable Number (MPN)" are assumed similar to CFU values and compared with reference values. Once the method to analyze the CFU will be available in Myanmar, the analytical method will be changed.

According to the quality standard for water baths in Japan, (Ministry of Environment, 1997), in case of E.Coli result is exceeding 1,000 CFU/100 ml, since it is assumed unsafety, it is considered unsuitable for water baths.

Source: Myanmar Koei International Ltd.

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2.5.2 Results of Reference Monitoring for Comparison with Discharging Points and Baseline of Discharged Creek

Results of water quality survey are summarized in Table 2.5-2. The results were compared with the target value of effluent water quality discharging to water body stipulated in the EIA report.

As the comparison with the target value, the results of SS and total coliform were exceeded than the target value. As for the result of SS, results at the surface water monitoring points (SW-2, SW-3 and SW-4) exceeded the target value due to two expected reasons; i) delivered from upstream area such as natural origin and wastewater from local industrial zone which outside of Thilawa SEZ, and ii) influence by water from the downstream of monitoring points due to flow back by tidal fluctuation.

As for the result of total coliform of surface water, results at the other surface water monitoring points (SW-3, SW-4) exceeded the target value due to two expected reasons; i) natural bacteria existed in discharged creek because there are various kinds of vegetation and creature such as birds, and small animals in and along the discharged creek and ii) wastewater from the local industrial zone outside of Thilawa SEZ. The result of total coliform at the reference of existing tube well (GW-1) also exceeded the target value. It may be possible due to expected reasons i) the poor maintenance of well which can increase the risk of bacteria and other harmful organisms ii) the well was not operated regularly and didn't use for local people long time. In addition, the result of E. Coli of surface water, all of results were under the reference value. Therefore, although the target value of total coliform was exceeded at monitoring point of SW-3 and SW-4, but it is considered that there is no significant impact on human health.

As for the result of total coliform in ground water, result at GW-1 (ground water in Moegyoe Swan monastery) exceeded the target value. However, the result of E.Coli at GW-1 was under the reference value. Therefore, although the target value of total coliform was exceeded at monitoring point of GW-1, but it is considered that there is no significant impact on human health.

Table 2.5-2 Result of Water Quality Survey for Reference Monitoring Points for Comparison with Discharging Points and Baseline of Discharged Creek

No.	Parameters	Unit	SW-2	SW-3	SW-4	GW-1	Target Value (Reference Value for Self-Monitoring)
1	Temperature	°C	28.0	25.5	25.9	34.2	Max. 40.0
2	pH	-	7.3	7.1	7.4	7.8	5.0~9.0
3	Suspended solid (SS)	mg/L	160	332	284	4	Max. 30
4	Dissolved oxygen (DO)	mg/L	4.44	7.79	6.58	5.48	-
5	BOD (5)	mg/L	6.01	7.29	6.07	2.01	Max. 20.00
6	COD (Cr)	mg/L	30.5	5.9	5.8	< 0.7	Max. 70.0
7	Total coliform	MPN/ 100ml	49	160,000	160,000	2,100	Max. 400
8	Total nitrogen (T-N)	mg/L	1.8	3.8	3.1	1.6	80.0
9	Total phosphorous (T-P)	mg/L	0.137	< 0.05	< 0.05	0.089	-
10	Color	TCU (True Color Unit)	30.03	15.96	16.73	5.43	-
11	Odor	TON (Threshold Odor Number)	1	1	1	1	-
12	Oil and Grease	mg/L	< 3.1	< 3.1	< 3.1	< 3.1	Max. 5.00
13	Mercury	mg/L	≤ 0.002	≤0.002	≤0.002	≤0.002	Max. 0.005
14	Zinc	mg/L	≤ 0.002	0.026	0.018	≤0.002	Max. 5.000
15	Arsenic	mg/L	0.016	0.020	0.018	≤0.01	Max. 0.250
16	Chromium	mg/L	0.010	0.032	0.028	≤0.002	Max. 0.500
17	Cadmium	mg/L	≤ 0.001	≤0.001	≤0.001	≤0.001	Max. 0.030
18	Selenium	mg/L	≤0.01	≤0.01	≤0.01	≤0.01	Max. 0.02
19	Lead	mg/L	≤ 0.002	≤0.002	≤0.002	≤0.002	Max. 0.200
20	Copper	mg/L	≤ 0.002	≤0.002	≤0.002	≤0.002	Max. 1.000
21	Barium	mg/L	0.056	0.056	0.05	0.078	Max. 1.000
22	Nickel	mg/L	0.016	0.048	0.038	≤0.002	Max. 0.200
23	Cyanide	mg/L	0.010	0.021	0.012	< 0.002	Max. 0.200
24	Free Chlorine	mg/L	0.1	0.3	< 0.1	0.1	Max. 1.0
25	Sulphide	mg/L	0.190	0.346	0.383	0.007	Max. 1.000
26	Formaldehyde	mg/L	0.071	0.098	0.089	< 0.003	Max. 1.000
27	Phenol	mg/L	0.002	< 0.002	< 0.002	0.004	Max. 1.000
28	Escherichia Coli	MPN/100ml* (SW)	< 1.8	1.8	< 1.8		(1000)* CFU/100ml
		MPN/100ml** (GW)				2.0	(100)** (MPN/100ml)
29	Flow Rate	m^3/s	0.027	-	-	-	-

Note: Red color means the exceeded results than target value.

*Note: Based on the water utilization at discharged creek, water quality C of quality standard for water baths in Japan, (Ministry of Environment, 1997) is set as a reference value of self-monitoring for surface water monitoring. However, due to limitation of capacity for analytical laboratory in Myanmar, the method to analyze the "Colony Forming Unit (CFU)" is not available in Myanmar. Therefore, the results of "Most Probable Number (MPN)" are assumed similar to CFU values and compared with reference values. Once the method to analyze the CFU will be available in Myanmar, the analytical method will be changed.

According to the quality standard for water baths in Japan, (Ministry of Environment, 1997), in case of E.Coli result is exceeding 1,000 CFU/100 ml, since it is assumed unsafety, it is considered unsuitable for water baths.

**Note: Based on the water utilization at monitoring point for ground water, B1(Irrigation water) of National Technical Regulation on Surface Water Quality in Vietnam (No. QCVN 08: 2008/BTNMT) is set as a reference value of self-monitoring for ground water monitoring.
Source: Myanmar Koei International Ltd.

CHAPTER 3: CONCLUSION AND RECOMMENDATIONS

As for the result of SS, total coliform, the results at the outlet of the centralized STP (SW-6) complied with the target value of both of them. It may prove that effluent from each locator was treated well by STP. On the other hand, parameters of SS at retention pond (SW-1) and monitoring point (SW-2, SW-3 and SW-4), total coliform at retention pond (SW-1) and retention canal (SW-5) were exceeded the target values in this period for main discharging gates of Thilawa SEZ Zone A. However, as mentioned in Section 2.5.1, in the first place, the monitoring points of retention pond (SW-1) and retention canal (SW-5) should be changed to a little upstream where are possible to avoid flow back by tidal fluctuation in order to evaluate the impact on water quality of SS and total coliform from the industrial area of Zone A to public water body. In addition, according to the result of self-monitoring of E. Coli at retention pond (SW-1) and retention canal (SW-5), results were under the reference value. Therefore, although the target value of total coliform was exceeded at monitoring point SW-1 and SW-5, but it is considered that there is no significant impact on human health.

As for parameters of SS, total coliform in surface water were exceeded the target values at reference monitoring points. As for the parameter of total coliform in ground water was exceeded the target value at reference tube well in monastery. As mentioned in Section 2.5.2, the result of self-monitoring of E. Coli at SW-2, SW-3, SW-4 and GW-1 were under the reference value. Therefore, although the target value of total coliform was exceeded at reference monitoring point, but it is considered that there is no significant impact on human health. The expected reasons for exceeding the target values of Total coliform are by natural origin (natural bacteria existed). As for parameters of total coliform exceeded the target values at reference of existing tube well (GW-1), expected reasons are poor maintenance of well, not operated regularly, not used by local people. It will be recommended to test the tube well for total coliform every year. However, it cannot reach to the conclusion of what is the reason to be exceeded the target values, thus the continuous monitoring and yearly trend analysis will be necessary based on the wet and dry season data.

As for future subject for main discharging points of Thilawa SEZ Zone A, the following action may be taken to achieve the target levels of SS/total coliform and appropriate water quality monitoring:

- To monitor Escherichia coli (E. Coli) level to identify health impact by coliform bacteria; and
- To examine the possibility of the overflow water from construction sites.
- To examine the possibility of the domestic wastewater from construction sites.

End of the Document

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APPENDIX-1 FIELD SURVEY PHOTOS

FOR DISCHARGING POINTS OF THILAWA SEZ ZONE A

Surface water sampling and onsite measurement at SW-1

Surface water sampling and onsite measurement at SW-5

Surface water sampling and onsite measurement at SW-6

FOR REFERENCE MONITORING POINTS FOR COMPARISON WITH DISCHARGING POINTS AND BASELINE OF DISCHARGED CREEK

Surface water sampling and onsite measurement at SW-2

Surface water sampling and onsite measurement at SW-3

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Surface water sampling and onsite measurement at SW-4

Ground water sampling and onsite measurement at GW-1

APPENDIX-2 LABORATORY RESULTS

FOR DISCHARGING POINTS AND AFTER CENTRALIZED STP

DOWA

GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD
Lot No. E1, ThilawaSEZ Zone A, Yangon Region, the Union of Myanmar
Tel 01-2309051, 09-796935149

Report No. : GEM-LAB-201712103
Revision No. : 1
Report Date : 21 December, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-1-1205
Sample No. : W-1712033
Waste Profile No. : -
Sampling Date : 5 December, 2017
Sampling By : Customer
Sample Received Date : 5 December, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105°C Method)	mg/l	226.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	8.76	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	9.0	0.7
4	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
5	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	92000	1.8
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	4.9	0.0
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	< 0.05	0.05
8	Color	APHA 2120C (Spectrophotometric Method)	TCU	10.74	0.00
9	Odor	APHA 2150 B (Threshold Odor Test)	TON	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	0.01	0.002
12	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.014	0.01
13	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.018	0.002
14	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.001	0.001
15	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
16	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
17	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
18	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.052	0.001
19	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.03	0.002
20	Cyanide	HACH 8027 (Pyridine -Pyrazalone Method	mg/l	0.030	0.002
21	Free Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.1
22	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/l	0.248	0.005
23	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	0.050	0.003
24	Phenol	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4AAP With Distillation))	mg/l	< 0.002	0.002

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

Analysed By :
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Assistant supervisor

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Approved By :
Tomoya Suzuki
Director

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED
MJTD

DOWA

GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD
Lot No. E1 ,ThilawaSEZ Zone A, Yangon Region, the Union of Myanmar
Tel 01-2309051 , 09 796935149

Report No. : GEM-LAB-201712104
Revision No. : 1
Report Date : 21 December, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-S-1205 — Sampling Date : 5 December, 2017
Sample No. : W-1712034 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 5 December, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	26.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	7.58	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	11.6	0.7
4	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
5	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	> 160000	1.8
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	1.1	0.0
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.073	0.05
8	Color	APHA 2120C (Spectrophotometric Method)	TCU	13.62	0.00
9	Odor	APHA 2150 B (Threshold Odor Test)	TON	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	≤ 0.002	0.002
12	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.012	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	≤ 0.001	0.001
15	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
16	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.018	0.002
17	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
18	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.032	0.001
19	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.004	0.002
20	Cyanide	HACH 8027 (Pyridine -Pyrazalone Method	mg/l	0.002	0.002
21	Free Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	< 0.1	0.1
22	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/l	0.046	0.005
23	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	0.017	0.003
24	Phenol	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4AAP With Distillation))	mg/l	< 0.002	0.002

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

LAB GEM

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Report No. : GEM-LAB-201712105
Revision No. : 1
Report Date : 21 December, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-6-1205
Sample No. : W-1712035
Waste Profile No. : -
Sampling Date : 5 December, 2017
Sampling By : Customer
Sample Received Date : 5 December, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	2.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	2.17	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	4.9	0.7
4	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
5	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	< 1.8	1.8
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	11.1	0.0
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	< 0.05	0.05
8	Color	APHA 2120C (Spectrophotometric Method)	TCU	6.81	0.00
9	Odor	APHA 2150 B (Threshold Odor Test)	TON	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	≤ 0.002	0.002
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	≤ 0.001	0.001
15	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
16	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
17	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
18	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.008	0.001
19	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.01	0.002
20	Cyanide	HACH 8027 (Pyridine -Pyrazalone Method	mg/l	< 0.002	0.002
21	Free Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.1
22	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/l	< 0.005	0.005
23	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	0.024	0.003
24	Phenol	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4AAP With Distillation))	mg/l	< 0.002	0.002

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

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FOR REFERENCE MONITORING POINTS FOR COMPARISON WITH DISCHARGING POINTS AND BASELINE OF DISCHARGED CREEK

DOWA

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Report No. : GEM-LAB-201712108
Revision No. : 1
Report Date : 21 December, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-2-1205
Sample No. : W-1712039
Waste Profile No. : -
Sampling Date : 5 December, 2017
Sampling By : Customer
Sample Received Date : 5 December, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	160.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	6.01	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	30.5	0.7
4	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
5	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	49	1.8
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	1.8	0.0
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.137	0.05
8	Color	APHA 2120C (Spectrophotometric Method)	TCU	30.03	0.00
9	Odor	APHA 2150 B (Threshold Odor Test)	TON	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	≤ 0.002	0.002
12	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.016	0.01
13	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.010	0.002
14	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.001	0.001
15	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
16	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
17	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
18	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.056	0.001
19	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.016	0.002
20	Cyanide	HACH 8027 (Pyridine -Pyrazalone Method	mg/l	0.010	0.002
21	Free Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.1
22	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/l	0.190	0.005
23	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	0.071	0.003
24	Phenol	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4AAP With Distillation))	mg/l	0.002	0.002

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

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Report No. : GEM-LAB-201712109
Revision No. : 1
Report Date : 21 December, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-3-1205 — Sampling Date : 5 December, 2017
Sample No. : W-1712040 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 5 December, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	332.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	7.29	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	5.9	0.7
4	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
5	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	160000	1.8
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	3.8	0.0
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	< 0.05	0.05
8	Color	APHA 2120C (Spectrophotometric Method)	TCU	15.96	0.00
9	Odor	APHA 2150 B (Threshold Odor Test)	TON	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	0.026	0.002
12	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.020	0.01
13	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.032	0.002
14	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.001	0.001
15	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
16	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
17	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
18	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.056	0.001
19	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.048	0.002
20	Cyanide	HACH 8027 (Pyridine -Pyrazalone Method	mg/l	0.021	0.002
21	Free Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.3	0.1
22	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/l	0.346	0.005
23	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	0.098	0.003
24	Phenol	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4AAP With Distillation))	mg/l	< 0.002	0.002

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

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Report No. : GEM-LAB-201712110
Revision No. : 1
Report Date : 21 December, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-4-1205 — Sampling Date : 5 December, 2017
Sample No. : W-1712041 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 5 December, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	284.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	6.07	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	5.8	0.7
4	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
5	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	160000	1.8
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	3.1	0.0
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	< 0.05	0.05
8	Color	APHA 2120C (Spectrophotometric Method)	TCU	16.73	0.00
9	Odor	APHA 2150 B (Threshold Odor Test)	TON	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	0.018	0.002
12	Arsenic	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.018	0.01
13	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.028	0.002
14	Cadmium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.001	0.001
15	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
16	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
17	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
18	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.05	0.001
19	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.038	0.002
20	Cyanide	HACH 8027 (Pyridine -Pyrazalone Method	mg/l	0.012	0.002
21	Free Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	< 0.1	0.1
22	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/l	0.383	0.005
23	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	0.089	0.003
24	Phenol	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4AAP With Distillation))	mg/l	< 0.002	0.002

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

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Report No. : GEM-LAB-201712106
Revision No. : 1
Report Date : 21 December, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-GW-1-1205 Sampling Date : 5 December, 2017
Sample No. : W-1712036 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 5 December, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	4.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	2.01	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	< 0.7	0.7
4	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
5	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	2100	1.8
6	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	1.6	0.0
7	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.089	0.05
8	Color	APHA 2120C (Spectrophotometric Method)	TCU	5.43	0.00
9	Odor	APHA 2150 B (Threshold Odor Test)	TON	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	≤ 0.002	0.002
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	≤ 0.001	0.001
15	Selenium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.01	0.01
16	Lead	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
17	Copper	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
18	Barium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	0.078	0.001
19	Nickel	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002
20	Cyanide	HACH 8027 (Pyridine -Pyrazalone Method	mg/l	< 0.002	0.002
21	Free Chlorine	APHA 4500 CL G (DPD Colorimetric Method)	mg/l	0.1	0.1
22	Sulphide	HACH 8131 (USEPA Methylene Blue Method)	mg/l	0.007	0.005
23	Formaldehyde	HACH 8110 (MBTH Method)	mg/l	< 0.003	0.003
24	Phenol	USEPA Method 420.1 (Phenolics (Spectrophotometric, Manual 4AAP With Distillation))	mg/l	0.004	0.002

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

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Director

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

APPENDIX-3 LABORATORY RESULTS

FOR DISCHARGING POINTS AND AFTER CENTRALIZED STP

DOWA

GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.
Lot No. E1, ThilawaSEZ Zone A, Yangon Region, the Union of Myanmar
Tel 01-2309051/ 09 796935149

Report No. : GEM-LAB-201712094
Revision No. : 1
Report Date : 21 December, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-1-1205 — Sampling Date : 5 December, 2017
Sample No. : W-1712043 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 5 December, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	5.5	1.8

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

Analysed By :
Ni Ni Aye Lwin
Assistant supervisor

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Tomoya Suzuki
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MYANMAR JAPAN THILAWA DEVELOPMENT MJTD

DOWA

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Lot No. E1 ,ThilawaSEZ Zone A, Yangon Region, the Union of Myanmar
Tel 01-2309051/ 09 796935149

Report No. : GEM-LAB-201712095
Revision No. : 1
Report Date : 21 December, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-5-1205
Sample No. : W-1712044
Waste Profile No. : -

Sampling Date : 5 December, 2017
Sampling By : Customer
Sample Received Date : 5 December, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	3.6	1.8

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

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Tel 01-2309051, 09 796935149

Report No. : GEM-LAB-201712096
Revision No. : 1
Report Date : 21 December, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-6-1205 — Sampling Date : 5 December, 2017
Sample No. : W-1712045 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 5 December, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	< 1.8	1.8

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

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MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED ★ MJTD

FOR REFERENCE MONITORING POINTS FOR COMPARISON WITH DISCHARGING POINTS AND BASELINE OF DISCHARGED CREEK

DOWA

GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD
Lot No. E1, ThilawaSEZ Zone A, Yangon Region, the Union of Myanmar
Tel:01-2309051/ 09 796933149

Report No. : GEM-LAB-201712099
Revision No. : 1
Report Date : 21 December, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-2-1205
Sample No. : W-1712048
Waste Profile No. : -
Sampling Date : 5 December, 2017
Sampling By : Customer
Sample Received Date : 5 December, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	< 1.8	1.8

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

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DOWA

GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.
Lot No. E1 ,ThilawaSEZ Zone A, Yangon Region, the Union of Myanmar
Tel 01-2309051/ 09 796935149

Report No. : GEM-LAB-201712100
Revision No. : 1
Report Date : 21 December, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-3-1205 Sampling Date : 5 December, 2017
Sample No. : W-1712049 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 5 December, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	1.8	1.8

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

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GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD
Lot No. E1 ,ThilawaSEZ Zone A, Yangon Region, the Union of Myanmar
Tel:01-2309051, 09 796935149

Report No. : GEM-LAB-201712101
Revision No. : 1
Report Date : 21 December, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-4-1205
Sample No. : W-1712050
Waste Profile No. : -
Sampling Date : 5 December, 2017
Sampling By : Customer
Sample Received Date : 5 December, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	< 1.8	1.8

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

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DOWA

GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD
Lot No. E1 ,ThilawaSEZ Zone A, Yangon Region, the Union of Myanmar
Tel 01-2309051 / 09 796935149

Report No. : GEM-LAB-201712097
Revision No. : 1
Report Date : 21 December, 2017
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-GW-1-1205
Sample No. : W-1712046
Waste Profile No. : -
Sampling Date : 5 December, 2017
Sampling By : Customer
Sample Received Date : 5 December, 2017

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	2.0	1.8

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

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MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED
MJTD

Thilawa Special Economic Zone (Zone A) Development Project (Operation Phase)

Appendix

Water and Waste Water Monitoring Report

February, 2018

WATER QUALITY MONITORING REPORT

FOR DEVELOPMENT OF INDUSTRIAL AREA

IN THILAWA SEZ ZONE A

(OPERATION STAGE)

(Bi-Monthly Monitoring)

February 2018

Myanmar Koei International Ltd.

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED
MJTD

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CHAPTER 1: INTRODUCTION

1.1 General

Thilawa Special Economic Zone (SEZ) is located in southern district of Yangon region and about 23 km southeast of Yangon city. As the developer of Thilawa SEZ, Myanmar Japan Thilawa Development Ltd. (MJTD) has a responsibility to carry out regular monitoring in the industrial area of Zone A in accordance with the approved Environmental Impact Assessment (EIA) report and Environmental Management Plan (EMP). MJTD has implemented monitoring various environmental items with the specified time frame to know the environmental conditions in and around the area. As for the monitoring of the water quality, total seven sampling points are set for water quality survey, named SW-1, SW-2, SW-3, SW-4, SW-5, SW-6, and GW-1 have been monitored in Thilawa SEZ and its surrounding area in timely manner. Among the seven locations, SW-1 and SW-5 are main discharging points of Thilawa SEZ and SW-6 is discharging from centralized Sewage Treatment Plant (STP) which is required to monitor by Environmental Monitoring Plan (EMoP) in EIA report of Thilawa SEZ Zone A. The remaining points SW-2, SW-3 and SW-4 are sampled as a reference monitoring for comparison with discharging points and baseline of discharged creek. Moreover, GW-1 is monitored as a reference of existing tube well which located in the monastery compound. Location of sampling points for water quality monitoring is shown in Figure 1.1-1.

Figure 1.1- 1 Location of Sampling Points of Water Quality Monitoring

CHAPTER 2: WATER QUALITY MONITORING

2.1 Monitoring Items

Sampling points and parameters for water quality monitoring are determined so as to cover the environmental monitoring plan of the EIA report.

Water quality sampling was carried out at seven locations. Among the seven locations, water flow measurement was carried out at five locations (SW-1, SW-2, SW-5 and SW-6) where can be measured by Current Meter. Monitoring items and sampling points are summarized in Table 2.1-1.

Table 2.1-1 Monitoring Items for Water Quality

No.	Parameters	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	GW-1	Remarks
1	pH	O	O	O	O	O	O	O	On-site measurement
2	Water temperature	O	O	O	O	O	O	O	On-site measurement
3	DO	O	O	O	O	O	O	O	On-site measurement
4	BOD (5)	O	O	O	O	O	O	O	Laboratory analysis
5	COD (Cr)	O	O	O	O	O	O	O	Laboratory analysis
6	Total nitrogen	O	O	O	O	O	O	O	Laboratory analysis
7	Suspended solids	O	O	O	O	O	O	O	Laboratory analysis
8	Total coliform	O	O	O	O	O	O	O	Laboratory analysis
9	Total phosphorous	O	O	O	O	O	O	O	Laboratory analysis
10	Color	O	O	O	O	O	O	O	Laboratory analysis
11	Odor	O	O	O	O	O	O	O	Laboratory analysis
12	Escherichia Coli (Self-monitoring)	O	O	O	O	O	O	O	Laboratory analysis
13	Flow Rate	O	O	-	-	O	O	-	On-site measurement

Source: Myanmar Koei International Ltd.

2.2 Description of Sampling Points

The outline of sampling points is mentioned in Table 2.2-1. The photos of conducting field survey at each sampling points are mentioned in Appendix-1.

Table 2.2-1 Outline of Sampling Points

No.	Station	Detailed Information
1	SW-1	**Coordinate-** N-16° 40' 13.5", E- 96° 16' 39.8"
		Location - Outlet of Retention Pond
		Survey Item – Surface water sampling and water flow rate measurement.
2	SW-2	**Coordinate-** N-16° 40' 20.69", E- 96° 17' 18.04"
		Location - Upstream of Shwe Pyauk Creek
		Survey Item – Surface water sampling and water flow rate measurement.
3	SW-3	**Coordinate-** N-16° 40' 5.50", E- 96° 16' 41.60"
		Location - Upstream of Shwe Pyauk Creek, after mixing point of Thilawa SEZ Zone A and Zone B.
		Survey Item – Surface water sampling.
4	SW-4	**Coordinate-** N-16° 39' 42.87", E- 96° 16' 27.36"
		Location - Downstream of Shwe Pyauk Creek
		Survey Item – Surface water sampling.
5	SW-5	**Coordinate-** N-16° 40' 10.7", E- 96° 16' 22.6"
		Location - Outlet of Retention Canal
		Survey Item – Surface water sampling and water flow rate measurement.
6	SW-6	**Coordinate-** N-16° 40' 27.13", E- 96° 16' 30.68"
		Location - Outlet from STP to Retention Pond
		Survey Item – Surface water sampling and water flow rate measurement.
7	GW-1	**Coordinate-** N-16° 40' 25.10", E- 96° 16' 31.70"
		Location - In Moegyoe Swan Monastery
		Survey Item – Ground Water Sampling

Source: Myanmar Koei International Ltd.

SW-1

SW-1 was collected at the discharge point of retention pond which is located in the east of Moegyoe Swan monastery. This drainage is flowing from north to south and then connected to the Shwe Pyauk creek through earth drain. The water quality of this monitoring point has been influenced by the water from downstream due to flow back by tidal fluctuation. In addition, it seems that a part of wastewater from monastery has reached to the culvert in the SEZ area and discharging to the retention pond.

SW-2 (Reference Point)

SW-2 was collected at the upstream of Shwe Pyauk creek. This sampling point is located at the southeast of Zone A area and at the south of Dagon-Thilawa road. The surrounding area are Zone B in the southwest, local industrial zone in the east and paddy field in the west respectively.

SW-3 (Reference Point)

SW-3 was collected at the upstream of Shwe Pyauk creek after mixing point of Zone A and Zone B, which is flowing from east to west and then entering into the Yangon River. The distance is about 1.2 km downstream of SW-2. This sampling point is located at south of Zone A area and Dagon-Thilawa road. The surrounding area are Zone B in the south, local industrial zone in the east and paddy field in the south and west respectively.

SW-4 (Reference Point)

SW-4 was collected at the downstream of Shwe Pyauk creek, after mixing of discharge water from local industrial zone, construction site of Zone B and Zone A, which is flowing from east to west and then entering into the Yangon River. The distance is about 820 m downstream of SW-3. This sampling point is located at southwest of Zone A area and at the south of Dagon-Thilawa road. The surrounding area are Zone B and local industrial zone in the east and paddy field in the south and west respectively.

SW-5

SW-5 was collected at retention canal near main gate of Thilawa SEZ. Most of the water collected in this canal is rain water and domestic wastewater from surrounding. This canal is also connected to the Shwe Pyauk creek. The water quality of this monitoring point may have been influenced by the water from downstream due to flow back by tidal fluctuation.

SW-6

SW-6 was collected at drain outlet of centralized STP which is located in the north of Moegyoe Swan monastery compound and retention pond (SW-1). Then the treated water is flowing to the retention pond.

GW-1 (Reference of Existing Tube Well)

GW-1 was collected from tube well as ground water sample. It is located in the compound of Moegyoe Swan monastery. The surrounding area are Zone A in the west, retention pond in the east and Dagon-Thilawa road in the south respectively.

2.3 Monitoring Method

All water samples were collected with cleaned sampling bottle and analyzed by the following standard method as shown in Table 2.3-1. All samples were kept in iced boxes keeping at 2-4° C and were transported to the laboratory. Among the parameters; water temperature, pH and DO were measured by the on-site instrument "Horiba, U-52" and water flow rate was also conducted by using the on-site instrument "Tamaya Digital Current Meter".

Table 2.3-1 Analytic Method for Water Quality

No.	Parameter	Method
1	Water Temperature	Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
2	pH	Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
3	Dissolved oxygen (DO)	Instrument Analysis Method (Horiba, U-52, Multi Water Quality Checker)
4	BOD (5)	APHA 5210 B (5 days BOD Test)
5	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)
6	Total nitrogen (T-N)	HACH Method 10072(TNT Persulfate Digestion Method)
7	Suspended solids (SS)	APHA 2540D (Dry at 103-105'C Method)
8	Total coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)
9	Total phosphorous (T-P)	APHA 4500-P E (Ascorbic Acid Method)
10	Color	APHA 2120C (Spectrophotometric Method)
11	Odor	APHA 2150 B (Threshold Odor Test)
12	Escherichia Coli	APHA 9221 F (Escherichia Coli Procedure Using Fluorogenic Substrate)
13	Flow Rate	Detection of Electromagnetic Elements (Real-time measurement by UC-200V Digital Current Meters)

Source: Myanmar Koei International Ltd.

2.4 Monitoring Period

Water quality and water flow rate monitoring were conducted on 5th February 2018 and sampling time is shown in Table 2.4-1 to avoid tidal effect. The tide record for Yangon River, Myanmar on 5th February 2018 is shown in Table 2.4-2.

Table 2.4-1 Sampling Time of Each Station

No.	Station	Sampling Time
1	SW-1	05/02/2018 13:28
2	SW-2	05/02/2018 11:06
3	SW-3	05/02/2018 09:21
4	SW-4	05/02/2018 09:55
5	SW-5	05/02/2018 13:06
6	SW-6	05/02/2018 14:04
7	GW-1	05/02/2018 14:55

Source: Myanmar Koei International Ltd.

Table 2.4-2 Tide Record for Yangon River, Myanmar

Date	Time	Height	Tide Conditions
05/02/2018	02:20	0.6	Low Tide
	07:50	5.5	High Tide
	14:40	0.6	Low Tide
	20:10	5.4	High Tide

Source: Myanmar Port Authority, Tide Table for the Yangon River and Elephant Point, 2018.

2.5 Monitoring Results

Results of water quality monitoring are summarized in Table 2.5-1. Analytical results of the laboratory are described in Appendix-2. The results were compared with the target value of effluent water quality discharging to water body stipulated in the EIA report.

2.5.1 Results of Water Quality at the Outlet of Sewage Treatment Plant of industrial Area of Thilawa SEZ and at the Point before discharging to Creek

As the comparison with the target value, the results of pH, suspended solid (SS), total coliform were exceeded than the target values.
As for the result of pH, the result at the outlet of the centralized STP (SW-6) complied with the target value. On the other hand, result at the monitoring points of retention pond (SW-1), exceeded the target value due to the expected reason; i) might be rainwater polluted with concrete washout water discharge from construction sites of Zone A, (ii) might be domestic wastewater discharge that contains detergents and soap-based products.
As for the result of SS, the result at the outlet of the centralized STP (SW-6) complied with the target value. It implied that effluents from each locator were treated well by the STP. On the other hand, results at the monitoring points of retention pond (SW-1) and retention canal (SW-5) before discharging to creek, exceeded the target value due to the expected reasons; i) surface water run-off from bare land in Zone A and ii) influence by water from the downstream due to flow back by tidal fluctuation.

As for the result of total coliform of surface water, the result at the outlet of the centralized STP (SW-6) complied with the target value. It may prove that effluents from each locator was treated well by the STP. The result at the retention pond (SW-1) also complied with the target value. On the other hand, results at the monitoring points retention canal (SW-5) exceeded the target value due to the expected reasons: the potential expected reason might natural bacteria existed in all area of Zone A because there are various kinds of vegetation and creature such as birds, and small animals in and along the retention canals and retention ponds.
Since the composition of the total coliform include bacteria from natural origin, and even after Total Coliform do not affect human health directly, self-monitoring for E. Coli analysis was carried out to identify health impact by coliform bacteria. As for the result of E.Coli of surface water, all of results were under the reference value. Therefore, although the target value of total coliform was exceeded at monitoring point of retention canal (SW-5), but it is considered that there is no significant impact on human health.

On the bases of the above examinations, the following actions shall be taken to monitor the impact on human health;

- To continue the self-monitoring for E. Coli level to identify health impact by coliform bacteria (While result of Total coliform are exceeded the target value)

Table 2.5-1 Results of Water Quality Monitoring at Main Discharging Gates and Discharged from Centralized STP

No.	Parameters	Unit	SW-1	SW-5	SW-6	Target Value (Reference Value for Self-Monitoring)
1	Temperature	°C	33.2	30.9	31.6	Max. 40.0
2	pH	-	9.3	7.9	6.3	5.0~9.0
3	Suspended solid (SS)	mg/L	38	50	2	Max. 30
4	Dissolved oxygen (DO)	mg/L	6.07	5.52	4.72	-
5	BOD (5)	mg/L	4.10	5.25	0.41	Max. 20.00
6	COD (Cr)	mg/L	17.3	36.3	19.4	Max. 70.0
7	Total coliform	MPN/ 100ml	23	> 160,000	< 1.8	Max. 400
8	Total nitrogen (T-N)	mg/L	7.4	6.4	12.2	80.0
9	Total phosphorous (T-P)	mg/L	0.133	0.345	0.121	-
10	Color	TCU (True Color Unit)	6.81	51.21	0.00	-
11	Odor	TON (Threshold Odor Number)	1	1	1.4	-
12	Escherichia Coli	MPN/100ml	2.0	47.0	< 1.8	(1,000)* (CFU/100ml)
13	Flow Rate	m^3/s	0.099	0.004	0.003	-

Note: Red color means exceeded value than target value.

*Note: Based on the water utilization at discharged creek, water quality C of quality standard for water baths in Japan, (Ministry of Environment, 1997) is set as a reference value for self-monitoring of E. coli for surface water monitoring. However, due to limitation of capacity for analytical laboratory in Myanmar, the method to analyze the "Colony Forming Unit (CFU)" is not available in Myanmar. Therefore, the results of "Most Probable Number (MPN)" are assumed similar to CFU values and compared with reference values. Once the method to analyze the CFU will be available in Myanmar, the analytical method will be changed.

According to the quality standard for water baths in Japan, (Ministry of Environment, 1997), in case of E.Coli result is exceeding 1,000 CFU/100 ml, since it is assumed unsafety, it is considered unsuitable for water baths.

Source: Myanmar Koei International Ltd.

2.5.2 Results of Reference Monitoring for Comparison with Discharging Points and Baseline of Discharged Creek

Results of water quality monitoring are summarized in Table 2.5-2. The results were compared with the target value of effluent water quality discharging to water body stipulated in the EIA report.

As the comparison with the target value, the results of total coliform were exceeded than the target value. As for the result of total coliform of surface water, results at surface water monitoring points (SW-2, SW-3 and SW-4) exceeded the target value due to two expected reasons; i) runoff of animal waste from the undeveloped area and delivered from local industrial zone and illegal dumping site from outside of Thilawa SEZ in the upstream area, and ii) delivered from surrounding area by tidal effect. In addition, the result of E.Coli of surface water, all of results were under the reference value. Therefore, although the target value of total coliform was exceeded at monitoring point of SW-2, SW-3 and SW-4, but it is considered that there is no significant impact on human health.

As for the result of total coliform in ground water, result at GW-1 (ground water in Moegyoe Swan monastery) is also exceeded the target value. In addition, the result of E.Coli of ground water, all of results

were under the reference value. Therefore, although the target value of total coliform was exceeded at monitoring point of GW-1, but it is considered that there is no significant impact on human health.

Table 2.5-2 Result of Water Quality Monitoring for Reference Monitoring Points for Comparison with Discharging Points and Baseline of Discharged Creek

No.	Parameters	Unit	SW-2	SW-3	SW-4	GW-1	Target Value (Reference Value for Self-Monitoring)
1	Temperature	°C	26.2	27.3	27.0	37.1	Max. 40.0
2	pH	-	8.0	7.4	7.8	8.2	5.0~9.0
3	Suspended solid (SS)	mg/L	30	26	8	2	Max. 30
4	Dissolved oxygen (DO)	mg/L	6.52	5.40	5.94	4.88	-
5	BOD (5)	mg/L	3.13	2.86	3.72	2.56	Max. 20.00
6	COD (Cr)	mg/L	24.7	12.5	27.1	2.9	Max. 70.0
7	Total coliform	MPN/ 100ml	24,000	35,000	160,000	54,000	Max. 400
8	Total nitrogen (T-N)	mg/L	4.7	5.3	4.0	0.4	80.0
9	Total phosphorous (T-P)	mg/L	0.181	0.400	< 0.050	0.079	-
10	Color	TCU (True Color Unit)	35.63	10.00	12.74	0.00	-
11	Odor	TON (Threshold Odor Number)	2	1	1	1	-
12	Escherichia Coli	MPN/100 ml* (SW)	11.0	4.0	6.8		(1,000)* (CFU/100ml)
		MPN/100 ml** (GW)				14.0	(100)** (MPN/100ml)
13	Flow Rate	m^3/s	0.010	-	-	-	-

Note: Red colors means exceeded value than target value.

*Note: Based on the water utilization at discharged creek, water quality C of the quality standard for water baths in Japan, (Ministry of Environment, 1997) is set as a reference value of self-monitoring for surface water monitoring. However, due to limitation of capacity for analytical laboratory in Myanmar, the method to analyze the "Colony Forming Unit (CFU)" is not available in Myanmar. Therefore, the results of "Most Probable Number (MPN)" are assumed similar to CFU values and compared with reference values. Once the method to analyze the CFU will be available in Myanmar, the analytical method will be changed.

According to the quality standard for water baths in Japan, (Ministry of Environment, 1997), in case of E.Coli result is exceeding 1,000 CFU/100 ml, since it is assumed unsafety, it is considered unsuitable for water baths.

**Note: Based on the water utilization at monitoring point for ground water, B1(Irrigation water) of National Technical Regulation on Surface Water Quality in Vietnam (No. QCVN 08: 2008/BTNMT) is set as a reference value of self-monitoring for ground water monitoring.

Source: Myanmar Koei International Ltd.

CHAPTER 3: CONCLUSION AND RECOMMENDATIONS

As for the result of pH, the result at the monitoring points of retention pond (SW-1), exceeded the target value due to the expected reason; i) might be rainwater polluted with concrete washout water discharge from construction sites of Zone A, (ii) might be domestic wastewater discharge that contains detergents and soap-based products.

As for the result of SS and total coliform the results at the outlet of the centralized STP (SW-6) complied with the target value of both of them. It may prove that effluent from each locator was treated well by the STP. On the other hand, parameters of SS at retention pond (SW-1) and parameters of SS, total coliform at retention canal (SW-5) were exceeded the target values in this period for main discharging points of Thilawa SEZ Zone A. In addition, according to the result of self-monitoring of E. coli at retention canal (SW-5), result was under the reference value. Therefore, although the target value of total coliform was exceeded at monitoring point SW-5, but it is considered that there is no significant impact on human health.

As for parameters of SS and total coliform in surface water were exceeded the target values at reference monitoring points. As mentioned in Section 2.5.2, the result of self-monitoring of E. coli at SW-2, SW-3 and SW-4 were under the reference value. Therefore, although the target value of total coliform was exceeded at reference monitoring point, but it is considered that there is no significant impact on human health. The expected reasons for exceeding the target values of Total coliform are by natural origin (natural bacteria existed). As for the result of total coliform in ground water, result at GW-1 (ground water in Moegyoe Swan monastery) exceeded the target value. However, the result of E.Coli at GW-1 was under the reference value. Therefore, although the target value of total coliform was exceeded at monitoring point of GW-1, but it is considered that there is no significant impact on human health. It will be recommended to test the tube well for total coliform every year. However, it cannot reach to the conclusion of what is the reason to be exceeded the target values, thus the continuous monitoring and yearly trend analysis will be necessary to carry out based on the rainy and dry season data.

As for future subject for main discharging points of Thilawa SEZ Zone A, the following action may be taken to carry out the appropriate water quality monitoring:

- To monitor Escherichia coli (E. coli) level to identify health impact by coliform bacteria; and
- To monitor the possibility of the overflow water from construction sites.
- To monitor the possibility of the domestic wastewater from construction sites.

End of the Document

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED ★ MJTD

APPENDIX-1 FIELD SURVEY PHOTOS

FOR DISCHARGING POINTS OF THILAWA SEZ ZONE A

Surface water sampling and onsite measurement at SW-1

Surface water sampling and onsite measurement at SW-5

Surface water sampling and onsite measurement at SW-6

FOR REFERENCE MONITORING POINTS FOR COMPARISON WITH DISCHARGING POINTS AND BASELINE OF DISCHARGED CREEK

Surface water sampling and onsite measurement at SW-2

Surface water sampling and onsite measurement at SW-3

Surface water sampling and onsite measurement at SW-4

Ground water sampling and onsite measurement at GW-1

APPENDIX-2 LABORATORY RESULTS

FOR DISCHARGING POINTS AND AFTER CENTRALIZED STP

DOWA

GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.
Lot No. E1 ,ThilawaSEZ Zone A, Yangon Region, the Union of Myanmar
Tel:01-2309051/ 09 796935149

Report No. : GEM-LAB-201802091
Revision No. : 1
Report Date : 20 February, 2018
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-1-0205 Sampling Date : 5 February, 2018
Sample No. : W-1802011 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 5 February, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	38.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	4.10	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	17.3	0.7
4	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	7.4	0.0
5	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.133	0.05
6	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	23	1.8
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	6.81	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	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

Analysed By :
Ni Ni Aye Lwin
Assistant supervisor

LAB GEM

Approved By :
Tomoya Suzuki
Director

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DOWA

GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD
Lot No. E1 ,ThilawaSEZ Zone A, Yangon Region, the Union of Myanmar
Tel:01-2309051/ 09 796935149

Report No. : GEM-LAB-201802092
Revision No. : 1
Report Date : 20 February, 2018
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-5-0205 Sampling Date : 5 February, 2018
Sample No. : W-1802012 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 5 February, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	50.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	5.25	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	36.3	0.7
4	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	6.4	0.0
5	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.345	0.05
6	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	> 160000	1.8
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	51.21	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	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

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Report No. : GEM-LAB-201802093
Revision No. : 1
Report Date : 20 February, 2018
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-6-0205 Sampling Date : 5 February, 2018
Sample No. : W-1802013 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 5 February, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	2.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	0.41	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	19.4	0.7
4	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	12.2	0.0
5	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.121	0.05
6	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	< 1.8	1.8
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	0.00	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1.4	-

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

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FOR REFERENCE MONITORING POINTS FOR COMPARISON WITH DISCHARGING POINTS AND BASELINE OF DISCHARGED CREEK

DOWA

GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.
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Tel 01-2309051, 09 796935149

Report No. : GEM-LAB-201802094
Revision No. : 1
Report Date : 20 February, 2018
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-2-0205 Sampling Date : 5 February, 2018
Sample No. : W-1802014 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 5 February, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	30.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	3.13	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	24.7	0.7
4	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	4.7	0.0
5	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.181	0.05
6	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	24000	1.8
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	35.63	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	2	-
9	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
10	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002

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

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Report No. : GEM-LAB-201802095
Revision No. : 1
Report Date : 20 February, 2018
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-3-0205 Sampling Date : 5 February, 2018
Sample No. : W-1802015 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 5 February, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	26.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	2.86	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	12.5	0.7
4	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	5.3	0.0
5	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.4	0.05
6	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	35000	1.8
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	10.00	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	-
9	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	3.20	3.1
10	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002

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

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Report No. : GEM-LAB-201802096
Revision No. : 1
Report Date : 20 February, 2018
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-SW-4-0205 Sampling Date : 5 February, 2018
Sample No. : W-1802016 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 5 February, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	8.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	3.72	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	27.1	0.7
4	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	4.0	0.0
5	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	< 0.05	0.05
6	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	160000	1.8
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	12.74	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	1	-
9	Oil and Grease	APHA 5520B (Partition-Gravimetric Method)	mg/l	< 3.1	3.1
10	Chromium	APHA 3120 B (Inductively Coupled Plasma (ICP) Method)	mg/l	≤ 0.002	0.002

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

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Report No. : GEM-LAB-201802097
Revision No. : 1
Report Date : 20 February, 2018
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : -
Sample Description
Sample Name : MKI-GW-1-0205 Sampling Date : 5 February, 2018
Sample No. : W-1802017 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 5 February, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	SS	APHA 2540D (Dry at 103-105'C Method)	mg/l	2.00	-
2	BOD (5)	APHA 5210 B (5 Days BOD Test)	mg/l	2.56	0.00
3	COD (Cr)	APHA 5220D (Close Reflux Colorimetric Method)	mg/l	2.9	0.7
4	Total Nitrogen	HACH Method 10072 (TNT Persulfate Digestion Method)	mg/l	0.4	0.0
5	Total Phosphorous	APHA 4500-P E (Ascorbic Acid Method)	mg/l	0.079	0.05
6	Total Coliform	APHA 9221B (Standard Total Coliform Fermentation Technique)	MPN/100ml	54000	1.8
7	Color	APHA 2120C (Spectrophotometric Method)	TCU	0.00	0.00
8	Odor	APHA 2150 B (Threshold Odor Test)	TON	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

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Director

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APPENDIX-3 LABORATORY RESULT OF ESCHERICHIA COLI (SELF-MONITORING)

FOR DISCHARGING POINTS AND AFTER CENTRALIZED STP

DOWA

GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD
Lot No. E1 ,ThilawaSEZ Zone A, Yangon Region, the Union of Myanmar
Tel:01-2309051, 09 796935149

Report No. : GEM-LAB-201802082
Revision No. : 1
Report Date : 20 February, 2018
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : MJTD
Sample Description
Sample Name : MKI-SW-1-0205 Sampling Date : 5 February, 2018
Sample No. : W-1802020 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 5 February, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	2.0	1.8

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

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DOWA

GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD
Lot No. E1, ThilawaSEZ Zone A, Yangon Region, the Union of Myanmar
Tel 01-2309051, 09 796935149

Report No. : GEM-LAB-201802083
Revision No. : 1
Report Date : 20 February, 2018
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : MJTD
Sample Description
Sample Name : MKI-SW-S-0205 — Sampling Date : 5 February, 2018
Sample No. : W-1802021 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 5 February, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	47.0	1.8

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

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DOWA

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Lot No. E1, ThilawaSEZ Zone A, Yangon Region, the Union of Myanmar
Tel 01-2309051, 09 796935149

Report No. : GEM-LAB-201802084
Revision No. : 1
Report Date : 20 February, 2018
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : MJTD
Sample Description
Sample Name : MKI-SW-6-0205 — Sampling Date : 5 February, 2018
Sample No. : W-1802022 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 5 February, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	< 1.8	1.8

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

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FOR REFERENCE MONITORING POINTS FOR COMPARISON WITH DISCHARGING POINTS AND BASELINE OF DISCHARGED CREEK

DOWA

GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD
Lot No. E1, ThilawaSEZ Zone A, Yangon Region, the Union of Myanmar
Tel 01-2309051/ 09 796935149

Report No. : GEM-LAB-201802085
Revision No. : 1
Report Date : 20 February, 2018
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : MJTD
Sample Description
Sample Name : MKI-SW-2-0205 — Sampling Date : 5 February, 2018
Sample No. : W-1802023 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 5 February, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	11.0	1.8

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

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Lot No. E1, ThilawaSEZ Zone A, Yangon Region, the Union of Myanmar
Tel 01-2309051, 09 796935149

Report No. : GEM-LAB-201802086
Revision No. : 1
Report Date : 20 February, 2018
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : MJTD
Sample Description
Sample Name : MKI-SW-3-0205 — Sampling Date : 5 February, 2018
Sample No. : W-1802024 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 5 February, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	4.0	1.8

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

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DOWA

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Lot No. E1, ThilawaSEZ Zone A, Yangon Region, the Union of Myanmar
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Report No. : GEM-LAB-201802087
Revision No. : 1
Report Date : 20 February, 2018
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : MJTD
Sample Description
Sample Name : MKI-SW-4-0205 — Sampling Date : 5 February, 2018
Sample No. : W-1802025 — Sampling By : Customer
Waste Profile No. : - — Sample Received Date : 5 February, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	6.8	1.8

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

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Director

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED ★ MJTD

DOWA

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Report No. : GEM-LAB-201802088
Revision No. : 1
Report Date : 20 February, 2018
Application No. : 0049-C001

Analysis Report

Client Name : Myanmar Koei International LTD (MKI)
Address : No.1A /28, Mya Thidar Housing, Ward 11, South Okkalapa.
Project Name : MJTD
Sample Description
Sample Name : MKI-GW-1-0205 Sampling Date : 5 February, 2018
Sample No. : W-1802026 Sampling By : Customer
Waste Profile No. : - Sample Received Date : 5 February, 2018

No.	Parameter	Method	Unit	Result	LOQ
1	Escherichia Coli	APHA 9221 F Escherichia Coli Procedure Using Fluorogenic Substrate	MPN/100ml	14.0	1.8

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

Analysed By :
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LAB
GEM

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Tomoya Suzuki
Director

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED
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Thilawa Special Economic Zone (Zone A) Development Project (Operation Phase)

Appendix

Air Quality Monitoring Report

February, 2018

AIR QUALITY MONITORING

REPORT

FOR DEVELOPMENT OF INDUSTRIAL AREA

THILAWA SEZ ZONE A

(OPERATION STAGE)

(BI-ANNUALLY MONITORING)

February 2018

Myanmar Koei International Ltd.

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CHAPTER 1: OUTLINES AND SUMMARY OF MONITORING PLAN

1.1 General

Thilawa Special Economic Zone (TSEZ) is located in southern district of Yangon region and about 23 km southeast of Yangon city. As the developer of Thilawa SEZ, Myanmar Japan Thilawa Development Ltd. (MJTD) has a responsibility to carry out regular environmental monitoring in the industrial area of Zone A in accordance with the approved Environmental Impact Assessment (EIA) report with Environmental Management Plan (EMP). MJTD has implemented monitoring various environmental items with the specified time frame to know the environmental conditions in and around the area.

1.2 Outlines of Monitoring Plan

To assess the environmental condition under the operation of industrial area in and around Thilawa SEZ Zone A, Air quality had been monitored from 6th Feb 2018 – 13th Feb 2018 as follows;

Table 1.2-1 Outlines of Air Quality Monitoring Plan

Monitoring Date	Monitoring Item	Parameters	Number of Point	Duration	Monitoring Methodology
From 6th Feb– 13th Feb, 2018	Air Quality	CO, NO_2, TSP, PM_{10}, and SO_2	1	7 Days	On site measurement by Haz-Scanner Environmental Perimeter Air Station (EPAS)

CHAPTER 2: AIR QUALITY MONITORING

2.1 Monitoring Item

The parameters for air quality monitoring were CO, NO_2, TSP, PM_{10}, and SO_2.

2.2 Monitoring Location

The air quality measurement equipment, "Haz-Scanner Environmental Perimeter Air Station (EPAS) was set up inside the Thilawa SEZ Zone A which is 170 meters away from Gate-3, N: 16°40'34.80", E: 96°15'53.40", surrounded by the factories of Thilawa SEZ Zone A. Possible emission sources are dust emissions from construction activities and exhaust gas emissions from surrounded factories. The location of air quality monitoring is shown in the Figure 2.2-1.

Figure 2.2-1 Location of Air Quality Monitoring Point

2.3 Monitoring Period

Air quality monitoring was conducted seven consecutive days from 6th February – 13th February, 2018.

2.4 Monitoring Method

Monitoring of CO, NO_2, TSP, PM_{10}, and SO_2 were conducted by referring to the recommendation of the United States Environmental Protection Agency (U.S. EPA). The Haz-Scanner EPAS was used to collect ambient air pollutants. The EPAS measures automatically every one minute and directly read and recorded onsite for CO, NO_2, TSP, PM_{10}, and SO_2. Due to the limitation of the analytical equipment in Myanmar, TSP results was calculated as predicted value which is based on the results of PM_{10}. Therefore, the result of TSP was evaluated using the estimated TSP concentration values. The state of air quality monitoring is shown in Figure 2.4-1.

Figure 2.4-1 Status of Air Quality Monitoring Point

2.5 Monitoring Results

The daily average value of air quality monitoring results of CO, NO_2, TSP, PM_{10}, and SO_2 are described in Table 2.5-1. Comparing with the target value of CO, NO_2, TSP, PM_{10}, and SO_2 prescribed in EIA report for Thilawa SEZ development project Zone A, all of results are under the target value.
Regarding the calculation of predicted TSP concentration, the correlation value between PM_{10} and TSP of ambient air quality guideline value in Thailand as below;
330 $\mu g/m^3$ (TSP standard value in Thailand) / 120 $\mu g/m^3$ (PM_{10} standard value in Thailand) = 2.75 (Correlation value)

Table 2.5-1 Air Quality Monitoring Result (Daily Average)

Date	CO	NO_2	TSP	PM_{10}	SO_2
	ppm	ppm	mg/m^3	mg/m^3	ppm
06 ~07 Feb, 2018	0.088 (0.101 mg/m^3)	0.047 (0.088 mg/m^3)	0.070	0.026	0.006 (0.016 mg/m^3)
07 ~08 Feb, 2018	0.079 (0.090 mg/m^3)	0.048 (0.091 mg/m^3)	0.120	0.044	0.005 (0.013 mg/m^3)
08 ~09 Feb, 2018	0.055 (0.063 mg/m^3)	0.051 (0.096 mg/m^3)	0.124	0.045	0.002 (0.004 mg/m^3)
09 ~10 Feb, 2018	0.056 (0.065 mg/m^3)	0.047 (0.088 mg/m^3)	0.157	0.057	0.003 (0.008 mg/m^3)
10 ~11 Feb, 2018	0.059 (0.068 mg/m^3)	0.044 (0.082 mg/m^3)	0.148	0.054	0.003 (0.008 mg/m^3)
11 ~12 Feb, 2018	0.105 (0.120 mg/m^3)	0.042 (0.080 mg/m^3)	0.107	0.039	0.003 (0.008 mg/m^3)
12 ~13 Feb, 2018	0.156 (0.179 mg/m^3)	0.043 (0.082 mg/m^3)	0.074	0.027	0.004 (0.009 mg/m^3)
7 Days Average Value	0.085 (0.098 mg/m^3)	0.046 (0.087 mg/m^3)	0.114	0.042	0.004 (0.010 mg/m^3)
Target Value	10.000 (11.45 mg/m^3)	< 0.06 (0.11 mg/m^3)	< 0.33	< 0.12	< 0.04 (0.11 mg/m^3)

Note: The target value of CO, NO_2 and SO_2 were converted to ppm units from mg/m^3.

CHAPTER 3: CONCLUSION AND ISSUES TO BE SOLVED

The result of air quality for CO, NO_2, TSP, PM_{10}, and SO_2 in each day are not exceeded the target value, thus there are no significant impacts on the surrounding air quality.

In conclusion of this environmental monitoring, there are no specific air quality impacts to the surrounding area of industrial area of Thilawa SEZ Zone A during this monitoring period.

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APPENDIX - HOURLY AIR RESULT

Date	Time	CO	NO2	TSP	PM_{10}	SO_2	Wind Speed	Wind Direction	
		ppm	ppm	mg/m^3	mg/m^3	ppm	kph	Deg.	Direction
		Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
06 Feb, 2018	10:00 ~ 10:59	0.015	0.057	0.020	0.007	0.000	1.33	40	NE
06 Feb, 2018	11:00 ~ 11:59	0.010	0.039	0.024	0.009	0.000	1.42	123	SE
06 Feb, 2018	12:00 ~ 12:59	0.009	0.041	0.017	0.006	0.001	1.65	201	SSW
06 Feb, 2018	13:00 ~ 13:59	0.057	0.042	0.039	0.014	0.000	2.23	248	W
06 Feb, 2018	14:00 ~ 14:59	0.102	0.045	0.087	0.032	0.001	2.20	202	SSW
06 Feb, 2018	15:00 ~ 15:59	0.109	0.051	0.170	0.062	0.000	2.38	204	SW
06 Feb, 2018	16:00 ~ 16:59	0.107	0.042	0.098	0.036	0.002	2.38	207	SW
06 Feb, 2018	17:00 ~ 17:59	0.131	0.049	0.040	0.014	0.002	2.73	242	WSW
06 Feb, 2018	18:00 ~ 18:59	0.262	0.048	0.074	0.027	0.011	1.85	221	SW
06 Feb, 2018	19:00 ~ 19:59	0.354	0.049	0.132	0.048	0.010	2.15	199	SSW
06 Feb, 2018	20:00 ~ 20:59	0.065	0.049	0.019	0.007	0.006	1.98	198	SSW
06 Feb, 2018	21:00 ~ 21:59	0.067	0.052	0.029	0.011	0.008	2.10	197	SSW
06 Feb, 2018	22:00 ~ 22:59	0.130	0.052	0.066	0.024	0.011	2.67	200	SSW
06 Feb, 2018	23:00 ~ 23:59	0.090	0.047	0.055	0.020	0.008	2.50	202	SSW
07 Feb, 2018	0:00 ~ 0:59	0.043	0.041	0.027	0.010	0.003	2.10	203	SW
07 Feb, 2018	1:00 ~ 1:59	0.050	0.044	0.041	0.015	0.006	1.45	201	SSW
07 Feb, 2018	2:00 ~ 2:59	0.060	0.051	0.048	0.018	0.017	1.42	203	SW
07 Feb, 2018	3:00 ~ 3:59	0.044	0.050	0.061	0.022	0.009	0.63	200	SSW
07 Feb, 2018	4:00 ~ 4:59	0.064	0.047	0.069	0.025	0.013	0.37	188	SSW
07 Feb, 2018	5:00 ~ 5:59	0.150	0.048	0.133	0.048	0.019	0.35	208	SW
07 Feb, 2018	6:00 ~ 6:59	0.127	0.043	0.176	0.064	0.012	0.65	226	WSW
07 Feb, 2018	7:00 ~ 7:59	0.042	0.052	0.106	0.039	0.005	0.55	174	S
07 Feb, 2018	8:00 ~ 8:59	0.026	0.040	0.091	0.033	0.002	1.52	215	SW
07 Feb, 2018	9:00 ~ 9:59	0.001	0.043	0.061	0.022	0.000	1.62	207	SW

Max	0.354 (0.406 mg/m^3)	0.057 (0.108 mg/m^3)	0.176	0.064	0.019 (0.049 mg/m^3)
Avg	0.088 (0.101 mg/m^3)	0.047 (0.088 mg/m^3)	0.070	0.026	0.006 (0.016 mg/m^3)
Min	0.001 (0.001 mg/m^3)	0.039 (0.074 mg/m^3)	0.017	0.006	0.000 (0.000 mg/m^3)

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Date	Time	CO	NO_2	TSP	PM_{10}	SO_2	Wind Speed	Wind Direction	
		ppm	ppm	mg/m^3	mg/m^3	ppm	kph	Deg.	Direction
		Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
07 Feb, 2018	10:00 ~ 10:59	0.001	0.031	0.064	0.023	0.000	1.37	192	SSW
07 Feb, 2018	11:00 ~ 11:59	0.000	0.038	0.036	0.013	0.000	1.77	189	SSW
07 Feb, 2018	12:00 ~ 12:59	0.000	0.038	0.024	0.009	0.000	2.48	194	SSW
07 Feb, 2018	13:00 ~ 13:59	0.005	0.040	0.041	0.015	0.000	2.28	197	SSW
07 Feb, 2018	14:00 ~ 14:59	0.025	0.045	0.083	0.030	0.000	2.27	222	SW
07 Feb, 2018	15:00 ~ 15:59	0.103	0.048	0.068	0.025	0.000	2.85	238	WSW
07 Feb, 2018	16:00 ~ 16:59	0.161	0.053	0.062	0.023	0.000	2.85	236	WSW
07 Feb, 2018	17:00 ~ 17:59	0.149	0.062	0.080	0.029	0.000	2.25	234	WSW
07 Feb, 2018	18:00 ~ 18:59	0.140	0.047	0.020	0.007	0.008	2.00	206	SW
07 Feb, 2018	19:00 ~ 19:59	0.203	0.050	0.058	0.021	0.013	2.20	196	SSW
07 Feb, 2018	20:00 ~ 20:59	0.034	0.045	0.076	0.028	0.007	1.88	197	SSW
07 Feb, 2018	21:00 ~ 21:59	0.449	0.048	0.346	0.126	0.031	1.85	200	SSW
07 Feb, 2018	22:00 ~ 22:59	0.001	0.051	0.011	0.004	0.001	1.57	199	SSW
07 Feb, 2018	23:00 ~ 23:59	0.058	0.059	0.097	0.035	0.013	1.48	218	SW
08 Feb, 2018	0:00 ~ 0:59	0.048	0.047	0.146	0.053	0.005	1.40	240	WSW
08 Feb, 2018	1:00 ~ 1:59	0.036	0.051	0.170	0.062	0.004	0.65	251	W
08 Feb, 2018	2:00 ~ 2:59	0.106	0.049	0.202	0.073	0.008	0.53	206	SW
08 Feb, 2018	3:00 ~ 3:59	0.139	0.050	0.206	0.075	0.013	0.53	232	WSW
08 Feb, 2018	4:00 ~ 4:59	0.017	0.058	0.233	0.085	0.000	0.12	159	S
08 Feb, 2018	5:00 ~ 5:59	0.058	0.056	0.265	0.097	0.004	0.20	167	S
08 Feb, 2018	6:00 ~ 6:59	0.096	0.052	0.284	0.103	0.009	0.38	156	SSE
08 Feb, 2018	7:00 ~ 7:59	0.054	0.052	0.153	0.056	0.003	0.27	170	S
08 Feb, 2018	8:00 ~ 8:59	0.009	0.046	0.091	0.033	0.000	1.15	204	SW
08 Feb, 2018	9:00 ~ 9:59	0.000	0.043	0.061	0.022	0.000	1.83	225	SW

Max	0.449 (0.515 mg/m^3)	0.062 (0.116 mg/m^3)	0.346	0.126	0.031 (0.082 mg/m^3)
Avg	0.079 (0.090 mg/m^3)	0.048 (0.091 mg/m^3)	0.120	0.044	0.005 (0.013 mg/m^3)
Min	0.000 (0.000 mg/m^3)	0.031 (0.058 mg/m^3)	0.011	0.004	0.000 (0.000 mg/m^3)

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Date	Time			CO	NO2	TSP	PM_{10}	SO_2	Wind Speed	Wind Direction	
				ppm	ppm	mg/m^3	mg/m^3	ppm	kph	Deg.	Direction
				Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
08 Feb, 2018	10:00	~	10:59	0.003	0.028	0.061	0.022	0.000	1.53	208	SW
08 Feb, 2018	11:00	~	11:59	0.000	0.048	0.081	0.030	0.000	1.75	173	S
08 Feb, 2018	12:00	~	12:59	0.005	0.048	0.066	0.024	0.000	2.87	197	SSW
08 Feb, 2018	13:00	~	13:59	0.022	0.046	0.073	0.026	0.000	2.32	176	S
08 Feb, 2018	14:00	~	14:59	0.029	0.049	0.095	0.035	0.000	2.25	149	SSE
08 Feb, 2018	15:00	~	15:59	0.068	0.054	0.135	0.049	0.000	2.45	150	SSE
08 Feb, 2018	16:00	~	16:59	0.135	0.060	0.140	0.051	0.000	1.83	156	SSE
08 Feb, 2018	17:00	~	17:59	0.167	0.064	0.122	0.044	0.002	1.67	158	S
08 Feb, 2018	18:00	~	18:59	0.087	0.060	0.052	0.019	0.000	0.98	170	S
08 Feb, 2018	19:00	~	19:59	0.092	0.061	0.101	0.037	0.000	1.33	189	SSW
08 Feb, 2018	20:00	~	20:59	0.115	0.053	0.127	0.046	0.002	1.38	191	SSW
08 Feb, 2018	21:00	~	21:59	0.093	0.051	0.127	0.046	0.001	1.00	185	SSW
08 Feb, 2018	22:00	~	22:59	0.021	0.053	0.107	0.039	0.001	1.48	201	SSW
08 Feb, 2018	23:00	~	23:59	0.018	0.057	0.106	0.039	0.001	1.38	211	SW
09 Feb, 2018	0:00	~	0:59	0.068	0.061	0.137	0.050	0.000	1.58	213	SW
09 Feb, 2018	1:00	~	1:59	0.071	0.052	0.149	0.054	0.003	1.38	226	WSW
09 Feb, 2018	2:00	~	2:59	0.079	0.045	0.184	0.067	0.000	1.90	243	WSW
09 Feb, 2018	3:00	~	3:59	0.017	0.051	0.203	0.074	0.004	0.65	209	SW
09 Feb, 2018	4:00	~	4:59	0.033	0.046	0.184	0.067	0.004	0.22	193	SSW
09 Feb, 2018	5:00	~	5:59	0.036	0.046	0.194	0.070	0.012	0.27	194	SSW
09 Feb, 2018	6:00	~	6:59	0.101	0.047	0.219	0.080	0.005	0.30	185	SSW
09 Feb, 2018	7:00	~	7:59	0.034	0.051	0.132	0.048	0.001	0.72	205	SW
09 Feb, 2018	8:00	~	8:59	0.009	0.049	0.113	0.041	0.000	1.35	223	SW
09 Feb, 2018	9:00	~	9:59	0.023	0.043	0.065	0.024	0.004	1.58	231	WSW

Max	0.167 (0.192 mg/m^3)	0.064 (0.120 mg/m^3)	0.219	0.080	0.012 (0.032 mg/m^3)
Avg	0.055 (0.063 mg/m^3)	0.051 (0.096 mg/m^3)	0.124	0.045	0.002 (0.004 mg/m^3)
Min	0.000 (0.000 mg/m^3)	0.028 (0.053 mg/m^3)	0.052	0.019	0.000 (0.000 mg/m^3)

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

Date	Time	CO	NO_2	TSP	PM_{10}	SO_2	Wind Speed	Wind Direction	
		ppm	ppm	mg/m^3	mg/m^3	ppm	kph	Deg.	Direction
		Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
09 Feb, 2018	10:00 ~ 10:59	0.000	0.037	0.041	0.015	0.000	1.42	239	WSW
09 Feb, 2018	11:00 ~ 11:59	0.001	0.031	0.029	0.010	0.000	1.60	217	SW
09 Feb, 2018	12:00 ~ 12:59	0.000	0.032	0.045	0.016	0.000	2.03	189	SSW
09 Feb, 2018	13:00 ~ 13:59	0.000	0.032	0.045	0.016	0.000	2.55	196	SSW
09 Feb, 2018	14:00 ~ 14:59	0.027	0.039	0.059	0.022	0.000	2.38	196	SSW
09 Feb, 2018	15:00 ~ 15:59	0.044	0.045	0.093	0.034	0.000	2.08	158	S
09 Feb, 2018	16:00 ~ 16:59	0.137	0.052	0.125	0.046	0.000	2.13	143	SSE
09 Feb, 2018	17:00 ~ 17:59	0.129	0.062	0.130	0.047	0.000	1.97	167	S
09 Feb, 2018	18:00 ~ 18:59	0.116	0.067	0.122	0.044	0.000	2.70	198	SSW
09 Feb, 2018	19:00 ~ 19:59	0.130	0.055	0.119	0.043	0.001	2.35	198	SSW
09 Feb, 2018	20:00 ~ 20:59	0.102	0.054	0.139	0.050	0.010	1.98	201	SSW
09 Feb, 2018	21:00 ~ 21:59	0.045	0.054	0.139	0.050	0.006	1.93	202	SSW
09 Feb, 2018	22:00 ~ 22:59	0.040	0.054	0.136	0.049	0.001	1.82	207	SW
09 Feb, 2018	23:00 ~ 23:59	0.062	0.051	0.188	0.068	0.002	2.23	209	SW
10 Feb, 2018	0:00 ~ 0:59	0.035	0.046	0.197	0.072	0.003	1.72	219	SW
10 Feb, 2018	1:00 ~ 1:59	0.056	0.045	0.191	0.070	0.004	1.35	241	WSW
10 Feb, 2018	2:00 ~ 2:59	0.025	0.049	0.202	0.073	0.005	0.83	257	W
10 Feb, 2018	3:00 ~ 3:59	0.031	0.050	0.189	0.069	0.004	0.20	282	WNW
10 Feb, 2018	4:00 ~ 4:59	0.102	0.050	0.263	0.096	0.013	0.20	274	WNW
10 Feb, 2018	5:00 ~ 5:59	0.071	0.049	0.405	0.147	0.001	0.33	310	NW
10 Feb, 2018	6:00 ~ 6:59	0.079	0.044	0.291	0.106	0.010	0.38	269	W
10 Feb, 2018	7:00 ~ 7:59	0.073	0.045	0.283	0.103	0.009	0.93	59	ENE
10 Feb, 2018	8:00 ~ 8:59	0.026	0.040	0.192	0.070	0.007	1.25	47	ENE
10 Feb, 2018	9:00 ~ 9:59	0.021	0.036	0.141	0.051	0.000	1.67	28	NE

Max	0.137 (0.157 mg/m^3)	0.067 (0.126 mg/m^3)	0.405	0.147	0.013 (0.034 mg/m^3)
Avg	0.056 (0.065 mg/m^3)	0.047 (0.088 mg/m^3)	0.157	0.057	0.003 (0.008 mg/m^3)
Min	0.000 (0.000 mg/m^3)	0.031 (0.057 mg/m^3)	0.029	0.010	0.000 (0.000 mg/m^3)

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

Date	Time	CO	NO_2	TSP	PM_{10}	SO_2	Wind Speed	Wind Direction	
		ppm	ppm	mg/m^3	mg/m^3	ppm	kph	Deg.	Direction
		Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
10 Feb, 2018	10:00 ~ 10:59	0.011	0.034	0.066	0.024	0.000	1.60	33	NE
10 Feb, 2018	11:00 ~ 11:59	0.005	0.027	0.059	0.022	0.000	1.47	41	NE
10 Feb, 2018	12:00 ~ 12:59	0.000	0.030	0.081	0.030	0.000	1.32	59	ENE
10 Feb, 2018	13:00 ~ 13:59	0.014	0.042	0.233	0.085	0.000	2.38	189	SSW
10 Feb, 2018	14:00 ~ 14:59	0.046	0.042	0.111	0.040	0.000	3.25	203	SW
10 Feb, 2018	15:00 ~ 15:59	0.030	0.035	0.150	0.055	0.000	1.98	160	S
10 Feb, 2018	16:00 ~ 16:59	0.114	0.046	0.105	0.038	0.000	1.95	177	S
10 Feb, 2018	17:00 ~ 17:59	0.102	0.058	0.097	0.035	0.002	1.45	166	S
10 Feb, 2018	18:00 ~ 18:59	0.104	0.058	0.115	0.042	0.006	0.92	178	S
10 Feb, 2018	19:00 ~ 19:59	0.180	0.055	0.200	0.073	0.004	0.93	181	SSW
10 Feb, 2018	20:00 ~ 20:59	0.040	0.049	0.150	0.055	0.008	1.03	204	SW
10 Feb, 2018	21:00 ~ 21:59	0.077	0.050	0.169	0.062	0.001	1.02	207	SW
10 Feb, 2018	22:00 ~ 22:59	0.040	0.048	0.169	0.061	0.002	0.88	205	SW
10 Feb, 2018	23:00 ~ 23:59	0.048	0.050	0.134	0.049	0.003	0.90	207	SW
11 Feb, 2018	0:00 ~ 0:59	0.032	0.048	0.164	0.060	0.005	1.20	265	W
11 Feb, 2018	1:00 ~ 1:59	0.038	0.046	0.152	0.055	0.008	0.55	231	WSW
11 Feb, 2018	2:00 ~ 2:59	0.037	0.046	0.172	0.062	0.010	0.43	253	W
11 Feb, 2018	3:00 ~ 3:59	0.051	0.049	0.192	0.070	0.003	0.58	273	WNW
11 Feb, 2018	4:00 ~ 4:59	0.065	0.050	0.183	0.067	0.001	0.82	288	WNW
11 Feb, 2018	5:00 ~ 5:59	0.094	0.046	0.198	0.072	0.004	0.80	101	ESE
11 Feb, 2018	6:00 ~ 6:59	0.169	0.042	0.216	0.079	0.006	0.42	151	SSE
11 Feb, 2018	7:00 ~ 7:59	0.099	0.034	0.207	0.075	0.010	0.55	69	E
11 Feb, 2018	8:00 ~ 8:59	0.018	0.029	0.136	0.049	0.001	1.43	56	ENE
11 Feb, 2018	9:00 ~ 9:59	0.013	0.031	0.081	0.030	0.001	1.62	50	ENE

Max	0.180 (0.206 mg/m^3)	0.058 (0.109 mg/m^3)	0.233	0.085	0.010 (0.026 mg/m^3)
Avg	0.059 (0.068 mg/m^3)	0.044 (0.082 mg/m^3)	0.148	0.054	0.003 (0.008 mg/m^3)
Min	0.000 (0.000 mg/m^3)	0.027 (0.051 mg/m^3)	0.059	0.022	0.000 (0.000 mg/m^3)

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

Date	Time	CO	NO_2	TSP	PM_{10}	SO_2	Wind Speed	Wind Direction	
		ppm	ppm	mg/m^3	mg/m^3	ppm	kph	Deg.	Direction
		Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
11 Feb, 2018	10:00 ~ 10:59	0.000	0.030	0.038	0.014	0.000	1.87	29	NE
11 Feb, 2018	11:00 ~ 11:59	0.003	0.030	0.032	0.012	0.000	2.23	123	SE
11 Feb, 2018	12:00 ~ 12:59	0.000	0.029	0.037	0.013	0.000	2.03	75	E
11 Feb, 2018	13:00 ~ 13:59	0.000	0.034	0.048	0.018	0.000	1.85	275	WNW
11 Feb, 2018	14:00 ~ 14:59	0.055	0.036	0.054	0.019	0.001	1.77	335	NNW
11 Feb, 2018	15:00 ~ 15:59	0.088	0.044	0.060	0.022	0.000	1.43	213	SW
11 Feb, 2018	16:00 ~ 16:59	0.155	0.048	0.092	0.033	0.000	1.50	254	W
11 Feb, 2018	17:00 ~ 17:59	0.244	0.052	0.113	0.041	0.000	1.58	211	SW
11 Feb, 2018	18:00 ~ 18:59	0.206	0.059	0.122	0.044	0.000	0.70	194	SSW
11 Feb, 2018	19:00 ~ 19:59	0.164	0.061	0.107	0.039	0.006	0.55	177	S
11 Feb, 2018	20:00 ~ 20:59	0.313	0.049	0.229	0.083	0.012	0.22	209	SW
11 Feb, 2018	21:00 ~ 21:59	0.343	0.045	0.299	0.109	0.013	0.22	215	SW
11 Feb, 2018	22:00 ~ 22:59	0.009	0.047	0.102	0.037	0.002	0.28	224	SW
11 Feb, 2018	23:00 ~ 23:59	0.033	0.050	0.033	0.012	0.001	0.22	256	W
12 Feb, 2018	0:00 ~ 0:59	0.058	0.054	0.020	0.007	0.001	0.20	192	SSW
12 Feb, 2018	1:00 ~ 1:59	0.032	0.047	0.045	0.016	0.002	0.60	228	WSW
12 Feb, 2018	2:00 ~ 2:59	0.064	0.044	0.122	0.045	0.001	0.42	251	W
12 Feb, 2018	3:00 ~ 3:59	0.121	0.042	0.185	0.067	0.003	0.42	221	SW
12 Feb, 2018	4:00 ~ 4:59	0.305	0.039	0.254	0.092	0.002	0.87	132	SE
12 Feb, 2018	5:00 ~ 5:59	0.088	0.026	0.185	0.067	0.004	0.70	26	NE
12 Feb, 2018	6:00 ~ 6:59	0.129	0.049	0.197	0.072	0.020	0.70	135	SSE
12 Feb, 2018	7:00 ~ 7:59	0.087	0.036	0.132	0.048	0.000	0.55	291	WNW
12 Feb, 2018	8:00 ~ 8:59	0.008	0.033	0.033	0.012	0.003	1.78	79	E
12 Feb, 2018	9:00 ~ 9:59	0.006	0.036	0.028	0.010	0.000	2.78	21	NNE

Max	0.343 (0.393 mg/m^3)	0.061 (0.114 mg/m^3)	0.299	0.109	0.020 (0.052 mg/m^3)
Avg	0.105 (0.120 mg/m^3)	0.042 (0.080 mg/m^3)	0.107	0.039	0.003 (0.008 mg/m^3)
Min	0.000 (0.000 mg/m^3)	0.026 (0.049 mg/m^3)	0.020	0.007	0.000 (0.000 mg/m^3)

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

Date	Time	CO	NO_2	TSP	PM_{10}	SO_2	Wind Speed	Wind Direction	
		ppm	ppm	mg/m^3	mg/m^3	ppm	kph	Deg.	Direction
		Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly	Hourly
12 Feb, 2018	10:00 ~ 10:59	0.003	0.033	0.037	0.013	0.000	2.63	22	NNE
12 Feb, 2018	11:00 ~ 11:59	0.017	0.030	0.030	0.011	0.000	2.80	20	NNE
12 Feb, 2018	12:00 ~ 12:59	0.010	0.029	0.022	0.008	0.001	2.87	22	NNE
12 Feb, 2018	13:00 ~ 13:59	0.036	0.037	0.014	0.005	0.001	2.53	36	NE
12 Feb, 2018	14:00 ~ 14:59	0.142	0.038	0.012	0.005	0.002	1.57	87	E
12 Feb, 2018	15:00 ~ 15:59	0.121	0.047	0.051	0.019	0.000	1.45	92	ESE
12 Feb, 2018	16:00 ~ 16:59	0.190	0.053	0.099	0.036	0.000	1.42	83	E
12 Feb, 2018	17:00 ~ 17:59	0.317	0.052	0.084	0.031	0.001	1.17	102	ESE
12 Feb, 2018	18:00 ~ 18:59	0.401	0.059	0.144	0.052	0.001	0.43	164	S
12 Feb, 2018	19:00 ~ 19:59	0.319	0.057	0.079	0.029	0.010	0.45	198	SSW
12 Feb, 2018	20:00 ~ 20:59	0.427	0.048	0.174	0.063	0.009	0.52	201	SSW
12 Feb, 2018	21:00 ~ 21:59	0.398	0.046	0.210	0.076	0.007	0.33	205	SW
12 Feb, 2018	22:00 ~ 22:59	0.115	0.048	0.024	0.009	0.001	0.22	289	WNW
12 Feb, 2018	23:00 ~ 23:59	0.066	0.048	0.029	0.010	0.002	0.13	169	S
13 Feb, 2018	0:00 ~ 0:59	0.401	0.040	0.099	0.036	0.001	0.60	159	S
13 Feb, 2018	1:00 ~ 1:59	0.256	0.039	0.071	0.026	0.000	1.48	22	NNE
13 Feb, 2018	2:00 ~ 2:59	0.107	0.049	0.087	0.032	0.001	1.47	19	NNE
13 Feb, 2018	3:00 ~ 3:59	0.072	0.043	0.074	0.027	0.008	0.87	74	E
13 Feb, 2018	4:00 ~ 4:59	0.025	0.044	0.081	0.030	0.009	1.08	24	NE
13 Feb, 2018	5:00 ~ 5:59	0.064	0.046	0.073	0.027	0.007	1.33	25	NE
13 Feb, 2018	6:00 ~ 6:59	0.150	0.046	0.087	0.032	0.011	1.77	21	NNE
13 Feb, 2018	7:00 ~ 7:59	0.034	0.041	0.101	0.037	0.006	2.30	16	NNE
13 Feb, 2018	8:00 ~ 8:59	0.027	0.033	0.065	0.024	0.007	3.22	14	NNE
13 Feb, 2018	9:00 ~ 9:59	0.044	0.038	0.028	0.010	0.001	3.40	5	NNE

Max	0.427 (0.489 mg/m^3)	0.059 (0.110 mg/m^3)	0.210	0.076	0.011 (0.030 mg/m^3)
Avg	0.156 (0.179 mg/m^3)	0.043 (0.082 mg/m^3)	0.074	0.027	0.004 (0.009 mg/m^3)
Min	0.003 (0.003 mg/m^3)	0.029 (0.054 mg/m^3)	0.012	0.005	0.000 (0.000 mg/m^3)

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

Thilawa Special Economic Zone (Zone A) Development Project (Operation Phase)

Appendix

Noise and Vibration Monitoring Report

February, 2018

NOISE AND VIBRATION

MONITORING REPORT

FOR DEVELOPMENT OF INDUSTRIAL AREA

THILAWA SEZ ZONE A

(OPERATION STAGE)

(BI-ANNUALLY MONITORING)

February 2018

Myanmar Koei International Ltd.

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CHAPTER 1: OUTLINES AND SUMMARY OF MONITORING PLAN

1.1 General

Thilawa Special Economic Zone (TSEZ) is located in southern district of Yangon region and about 23 km southeast of Yangon city. As the developer of Thilawa SEZ, Myanmar Japan Thilawa Development Ltd. (MJTD) has a responsibility to carry out regular environmental monitoring in the industrial area of Zone A in accordance with the approved Environmental Impact Assessment (EIA) report with Environmental Management Plan (EMP). MJTD has implemented monitoring various environmental items with the specified time frame to know the environmental conditions in and around the area.

1.2 Outlines of Monitoring Plan

To assess the environmental condition under the operation of industrial area in and around Thilawa SEZ Zone A, noise and vibration levels had been monitored from 6th February 2018 – 9th February 2018 as follows;

Table 1.2-1 Outlines of Noise and Vibration Level Monitoring

Monitoring Date	Monitoring Item	Parameters	Number of Points	Duration	Monitoring Methodology
From 6th February – 7th February, 2018	Noise Level	L_{Aeq}(dB)	1 (NV1)	24 hours	On-site measurement by "Rion NL-42 sound level meter"
From 8th February – 9th February, 2018	Noise Level	L_{Aeq}(dB)	1 (NV2)	24 hours	On-site measurement by "Rion NL-42 sound level meter"
From 7th February – 8th February, 2018	Noise Level	L_{Aeq}(dB)	1 (NV3)	24 hours	On-site measurement by "Rion NL-42 sound level meter"
From 6th February – 7th February, 2018	Vibration Level	L_{v10} (dB)	1 (NV1)	24 hours	On-site measurement by "Vibration Level Meter- VM-53A"
From 8th February – 9th February, 2018	Vibration Level	L_{v10} (dB)	1 (NV2)	24 hours	On-site measurement by "Vibration Level Meter- VM-53A"
From 7th February – 8th February, 2018	Vibration Level	L_{v10} (dB)	1 (NV3)	24 hours	On-site measurement by "Vibration Level Meter- VM-53A"

CHAPTER 2: NOISE AND VIBRATION LEVEL MONITORING

2.1 Monitoring Item

The noise and vibration level monitoring items are shown in Table 2.1-1.

Table 2.1-1 Monitoring Parameters for Noise and Vibration Level

No.	Item	Parameter
1	Noise	A-weighted loudness equivalent (L_{Aeq})
2	Vibration	Vibration level, vertical, percentile (L_{V10})

2.2 Monitoring Location

Noise and vibration levels were measured in front of administrative building, Thilawa SEZ Zone A, monitoring point (NV-1); N: 16°40'11.50", E: 96°16'32.00" for traffic noise concerned, at the east of the Thilawa SEZ Zone A, at the north of the Thilawa SEZ Zone A, monitoring point (NV-2); N: 16°41'27.60", E: 96°15'45.50", and at the west of the Thilawa SEZ Zone A, monitoring point (NV-3); N: 16°40'46.20" , E: 96°15'30.10", where is the nearest to the residential houses of Alwan sok village. The location of the noise and vibration monitoring points are shown in Figure 2.2-1.

Figure 2.2-1 Location of Noise and Vibration Level Monitoring Points

NV-1

NV-1 is located in front of administrative building, Thilawa SEZ and next to Dagon-Thilawa road which is paved with moderate to highly traffic volume during the day and night. Possible noise and vibration sources are operation activities from administration building of MJTD. In addition, passing of loader vehicles, dump trucks and road traffic also might be noise and vibration sources.

NV-2

NV-2 is located at the north of the Thilawa SEZ Zone A, surrounded by the residential houses of Alwan sok village between north to south-east and construction of factories in Thilawa SEZ Zone A between west to south respectively. Possible noise and vibration sources are operation and construction activities of surrounding tenants/locators of Thilawa SEZ Zone A area. In addition, daily human activities near by the residential house of Alwan sok village and road traffic might be noise and vibration sources.

NV-3

NV-3 is located at the west of the Thilawa SEZ Zone A, surrounded by the residential houses of Alwan sok village in north and northwest and garment factory in northeast, construction of factories in Thilawa SEZ Zone A in east respectively. Possible noise and vibration sources are Possible noise and vibration sources are operation and construction activities of surrounding tenants/locators of Thilawa SEZ Zone A area. In addition, daily human activities nearby Alwan sok village and road traffic might be noise and vibration sources. There is an access road situated northeast of NV-3.

2.3 Monitoring Method

Noise level was measured by "Rion NL-42 sound level meter" and automatically recorded every 10 minutes in a memory card. The vibration level meter was, VM-53A (Rion Co. Ltd., Japan), accompanied by a 3-axis accelerometer PV-83C (Rion Co. Ltd.) was placed on solid soil ground. Vertical vibration (Z axis), L_v, was measured every 10 minutes within the adaptable range of (10-70) dB at NV-1, (10-70) dB at NV-2, and (10-70) dB at NV-3 and recorded to a memory card.
The measurement period of noise and vibration was 24 hours for each monitoring point. The status of the noise and vibration level monitoring on NV-1, NV-2 and NV-3 are shown in Figure 2.3-1.

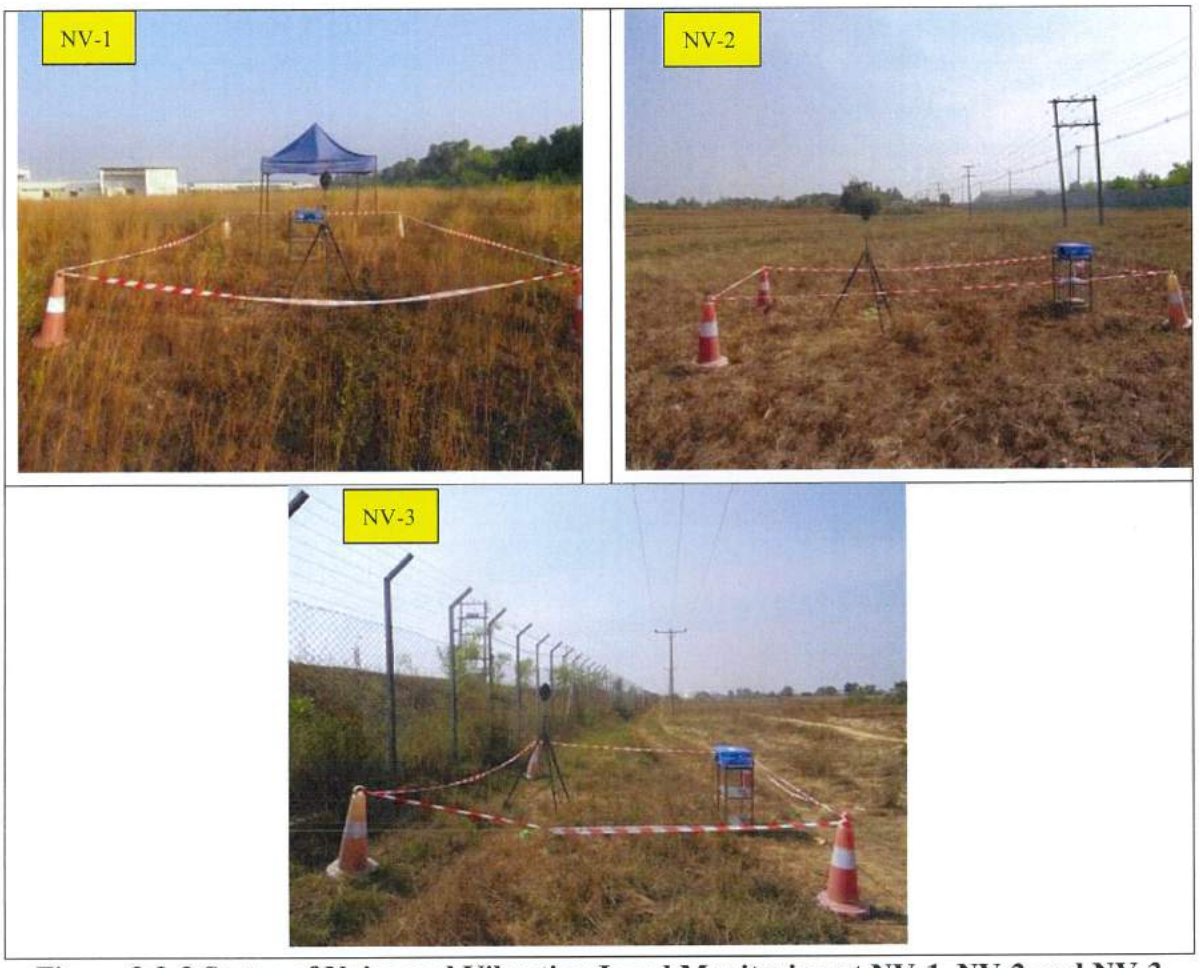

Figure 2.3-2 Status of Noise and Vibration Level Monitoring at NV-1, NV-2 and NV-3

2.4 Monitoring Results

Noise Monitoring Results

Noise monitoring results are separated daytime (6:00 AM to 10:00 PM), night time (10:00 PM to 6:00 AM) time frames for NV-1, daytime (7:00 AM to 7:00 PM), evening time (7:00 PM to 10:00 PM), and night time (10:00 PM to 7:00 AM) time frames respectively for NV-2 and NV-3. Noise measurement was carried out for one location on a 24-hour basis. The monitoring results are summarized in Table 2.4-1, Table 2.4-2, and Table 2.4-3 respectively. Hourly noise level monitoring results for NV-1, NV-2 and NV-3 are shown in Table 2.4-4, Table 2.4-5 and Table 2.4-6. During the detailed analysis of noise level for NV-1 on 24 hours, the results of noise level in day time (6:00 AM to 8:00 AM) and noise level in night time (4:00 AM to 6:00 AM) are higher than other times but all results were under the target values. According to the field survey records, the possible noise sources are pass by motorcycles and heavy vehicles, car horn, broadcasting songs by loudspeaker from near villages. Comparing with the target value of noise level in operation stage prescribed in EIA report for Thilawa SEZ development project Zone A, all results were under the target values at NV-1, NV-2 and NV-3.

Table 2.4-1 Results of Noise Levels (L_{Aeq}) Monitoring at NV-1

Date	(Traffic Noise Level) Equivalent Noise Level (L_{Aeq}, dB)	
	Day Time (6:00 AM – 10:00 PM)	Night Time (10:00 PM – 6:00 AM)
6th February – 7th February, 2018	64	66
Target Value	75	70

Note: Target value is applied to the noise standard along main road stipulated in the Noise Regulation Law (Japan) (Law No. 98 of 1968, Latest Amendment by Law No.91 of 2000).

Table 2.4-2 Results of Noise Levels (L_{Aeq}) Monitoring at NV-2

Date	(Commercial and Industrial Areas) Equivalent Noise Level (L_{Aeq}, dB)		
	Day Time (7:00 AM – 7:00 PM)	Evening Time (7:00 PM – 10:00 PM)	Night Time (10:00 PM – 7:00 AM)
8th February – 9th February, 2018	43	41	37
Target Value	70	65	60

Note: Target value is applied to the noise level during the operation stage in the EIA Report for Thilawa SEZ Development Project (Industrial Area of Zone A).

Table 2.4-3 Results of Noise Levels (L_{Aeq}) Monitoring at NV-3

Date	(Commercial and Industrial Areas) Equivalent Noise Level (L_{Aeq}, dB)		
	Day Time (7:00 AM – 7:00 PM)	Evening Time (7:00 PM – 10:00 PM)	Night Time (10:00 PM – 7:00 AM)
7th February – 8th February, 2018	45	48	45
Target Value	70	65	60

Note: Target value is applied to the noise level during the operation stage in the EIA Report for Thilawa SEZ Development Project (Industrial Area of Zone A).

Table 2.4-4 Hourly Noise Level (L_{Aeq}) Monitoring Results at NV-1

Date	Time	(L_{Aeq}, dB)	(L_{Aeq}, dB) Each Category	(L_{Aeq}, dB) Target Value
6th February – 7th February, 2018	6:00-7:00	69	64	75
	7:00-8:00	70		
	8:00:9:00	65		
	9:00-10:00	56		
	10:00-11:00	55		
	11:00-12:00	56		
	12:00-13:00	55		
	13:00-14:00	58		
	14:00-15:00	58		
	15:00-16:00	66		
	16:00-17:00	68		
	17:00-18:00	64		
	18:00-19:00	59		
	19:00-20:00	58		
	20:00-21:00	58		
	21:00-22:00	57		
	22:00-23:00	68	66	70
	23:00-24:00	57		
	24:00-1:00	55		
	1:00-2:00	53		
	2:00-3:00	53		
	3:00-4:00	67		
	4:00-5:00	70		
	5:00-6:00	70		

Table 2.4-5 Hourly Noise Level (L_{Aeq}) Monitoring Results at NV-2

Date	Time	(L_{Aeq}, dB)	(L_{Aeq}, dB) Each Category	(L_{Aeq}, dB) Target Value
8th February – 9th February, 2018	7:00-8:00	41	43	70
	8:00:9:00	43		
	9:00-10:00	43		
	10:00-11:00	40		
	11:00-12:00	40		
	12:00-13:00	38		
	13:00-14:00	45		
	14:00-15:00	46		
	15:00-16:00	44		
	16:00-17:00	46		
	17:00-18:00	44		
	18:00-19:00	43		
	19:00-20:00	42	41	65
	20:00-21:00	42		
	21:00-22:00	40		
	22:00-23:00	38	37	60
	23:00-24:00	37		
	24:00-1:00	37		
	1:00-2:00	36		
	2:00-3:00	36		
	3:00-4:00	31		
	4:00-5:00	32		
	5:00-6:00	38		
	6:00-7:00	39		

Table 2.4-6 Hourly Noise Level (L_{Aeq}) Monitoring Results at NV-3

Date	Time	(L_{Aeq}, dB)	(L_{Aeq}, dB) Each Category	(L_{Aeq}, dB) Target Value
7th February – 8th February, 2018	7:00-8:00	47	45	70
	8:00:9:00	42		
	9:00-10:00	41		
	10:00-11:00	39		
	11:00-12:00	40		
	12:00-13:00	41		
	13:00-14:00	51		
	14:00-15:00	43		
	15:00-16:00	44		
	16:00-17:00	42		
	17:00-18:00	47		
	18:00-19:00	49		
	19:00-20:00	49	48	65
	20:00-21:00	48		
	21:00-22:00	45		
	22:00-23:00	49	45	60
	23:00-24:00	47		
	24:00-1:00	41		
	1:00-2:00	41		
	2:00-3:00	38		
	3:00-4:00	41		
	4:00-5:00	42		
	5:00-6:00	43		
	6:00-7:00	46		

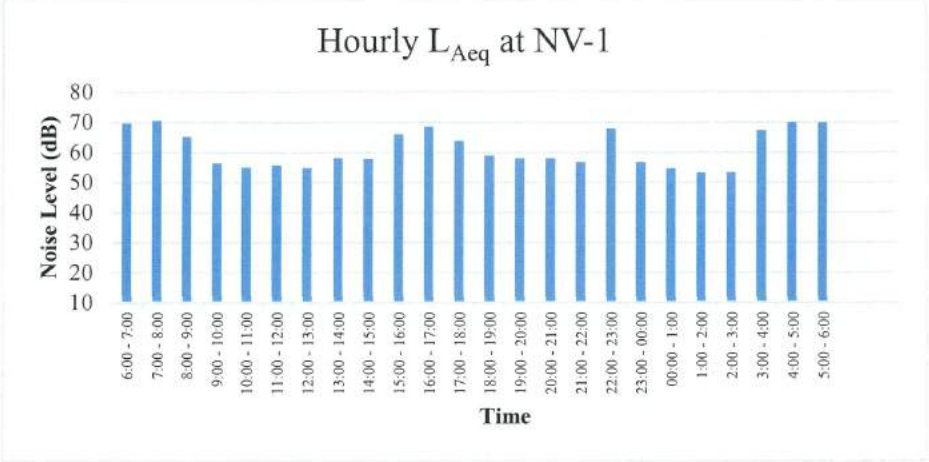

Figure 2.4-3 Results of Noise Levels (L_{Aeq}) Monitoring at NV-1

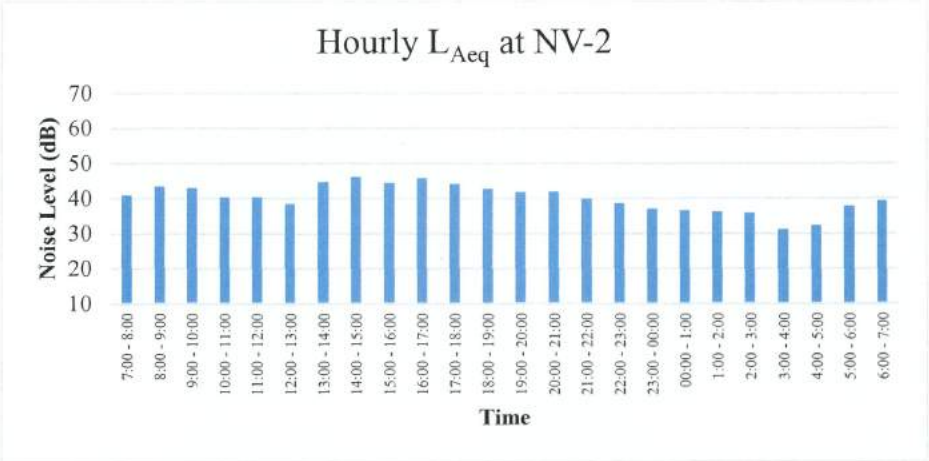

Figure 2.4-4 Results of Noise Levels (L_{Aeq}) Monitoring at NV-2

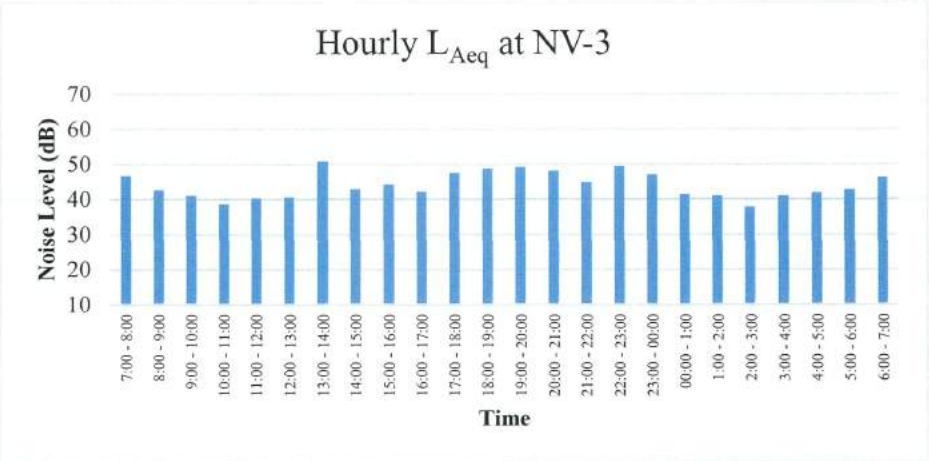

Figure 2.4-5 Results of Noise Levels (L_{Aeq}) Monitoring at NV-3

Vibration Monitoring Results

The results of vibration level are shown in Table 2.4-7, Table 2.4-8, and Table 2.4-9 respectively. Results of hourly vibration level monitoring for NV-1, NV-2 and NV-3 are summarized in Table 2.4-10, Table 2.4-11 and Table 2.4-12. By comparing with the target vibration level in operation stage in EIA report for Thilawa SEZ development project Zone A, all of results were under the target values.

Table 2.4-7 Results of Vibration Levels (L_{v10}) Monitoring at NV-1

Date	(Office, commercial facilities, and factories) Equivalent Vibration Level (L_{v10}, dB)		
	Day Time (7:00 AM – 7:00 PM)	Evening Time (7:00 PM – 10:00 PM)	Night Time (10:00 PM – 7:00 AM)
6th February – 7th February, 2018	51	47	45
Target Value	70	65	65

Note: Target value is applied to the noise level during the operation stage in the EIA Report for Thilawa SEZ Development Project (Industrial Area of Zone A).

Table 2.4-8 Results of Vibration Levels (L_{v10}) Monitoring at NV-2

Date	(Office, commercial facilities, and factories) Equivalent Vibration Level (L_{v10}, dB)		
	Day Time (7:00 AM – 7:00 PM)	Evening Time (7:00 PM – 10:00 PM)	Night Time (10:00 PM – 7:00 AM)
8th February – 9th February, 2018	30	22	18
Target Value	70	65	65

Note: Target value is applied to the noise level during the operation stage in the EIA Report for Thilawa SEZ Development Project (Industrial Area of Zone A).

Table 2.4-9 Results of Vibration Levels (L_{v10}) Monitoring at NV-3

Date	(Office, commercial facilities, and factories) Equivalent Vibration Level (L_{v10}, dB)		
	Day Time (7:00 AM – 7:00 PM)	Evening Time (7:00 PM – 10:00 PM)	Night Time (10:00 PM – 7:00 AM)
7th February – 8th February, 2018	31	27	24
Target Value	70	65	65

Note: Target value is applied to the noise level during the operation stage in the EIA Report for Thilawa SEZ Development Project (Industrial Area of Zone A).

Table 2.4-10 Results of Hourly Vibration Levels (L_{v10}) Monitoring at NV-1

Date	Time	(L_{v10}, dB)	(L_{v10}, dB) Each Category	(L_{v10}, dB) Target Value
6th February – 7th February, 2018	7:00-8:00	49	51	70
	8:00:9:00	50		
	9:00-10:00	50		
	10:00-11:00	52		
	11:00-12:00	52		
	12:00-13:00	51		
	13:00-14:00	50		
	14:00-15:00	51		
	15:00-16:00	52		
	16:00-17:00	52		
	17:00-18:00	52		
	18:00-19:00	49		
	19:00-20:00	47	47	65
	20:00-21:00	48		
	21:00-22:00	45		
	22:00-23:00	46	45	65
	23:00-24:00	47		
	24:00-1:00	44		
	1:00-2:00	45		
	2:00-3:00	44		
	3:00-4:00	46		
	4:00-5:00	42		
	5:00-6:00	44		
	6:00-7:00	47		

Table 2.4-11 Results of Hourly Vibration Levels (L_{v10}) Monitoring at NV-2

Date	Time	(L_{v10}, dB)	(L_{v10}, dB) Each Category	(L_{v10}, dB) Target Value
8th February – 9th February, 2018	7:00-8:00	22	30	70
	8:00:9:00	27		
	9:00-10:00	33		
	10:00-11:00	36		
	11:00-12:00	33		
	12:00-13:00	26		
	13:00-14:00	27		
	14:00-15:00	27		
	15:00-16:00	29		
	16:00-17:00	29		
	17:00-18:00	29		
	18:00-19:00	24		
	19:00-20:00	23	22	65
	20:00-21:00	20		
	21:00-22:00	22		
	22:00-23:00	22	18	65
	23:00-24:00	18		
	24:00-1:00	18		
	1:00-2:00	18		
	2:00-3:00	17		
	3:00-4:00	16		
	4:00-5:00	17		
	5:00-6:00	17		
	6:00-7:00	20		

Table 2.4-12 Results of Hourly Vibration Levels (L_{v10}) Monitoring at NV-3

Date	Time	(L_{v10}, dB)	(L_{v10}, dB) Each Category	(L_{v10}, dB) Target Value
7th February – 8th February, 2018	7:00-8:00	30	31	70
	8:00:9:00	28		
	9:00-10:00	29		
	10:00-11:00	29		
	11:00-12:00	30		
	12:00-13:00	31		
	13:00-14:00	36		
	14:00-15:00	29		
	15:00-16:00	30		
	16:00-17:00	29		
	17:00-18:00	31		
	18:00-19:00	31		
	19:00-20:00	29	27	65
	20:00-21:00	28		
	21:00-22:00	25		
	22:00-23:00	23	24	65
	23:00-24:00	22		
	24:00-1:00	23		
	1:00-2:00	25		
	2:00-3:00	22		
	3:00-4:00	23		
	4:00-5:00	21		
	5:00-6:00	22		
	6:00-7:00	30		

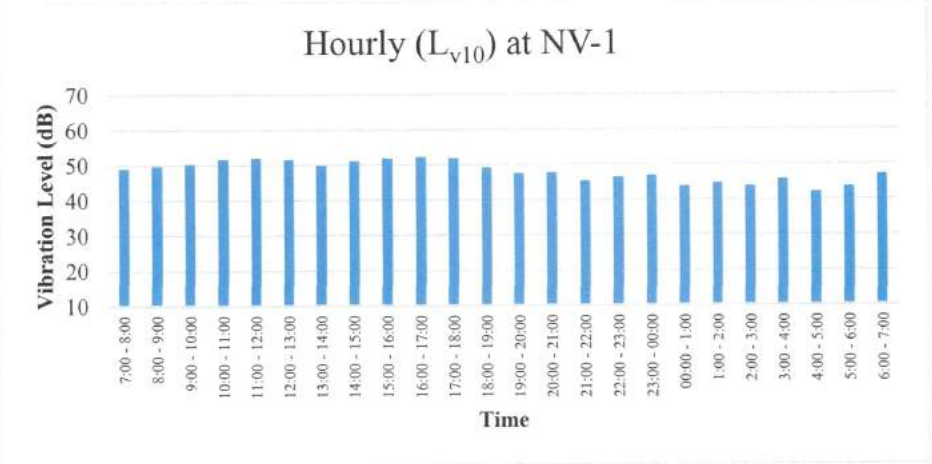

Figure 2.4-6 Results of Vibration Levels (L_{v10}) Monitoring at NV-1

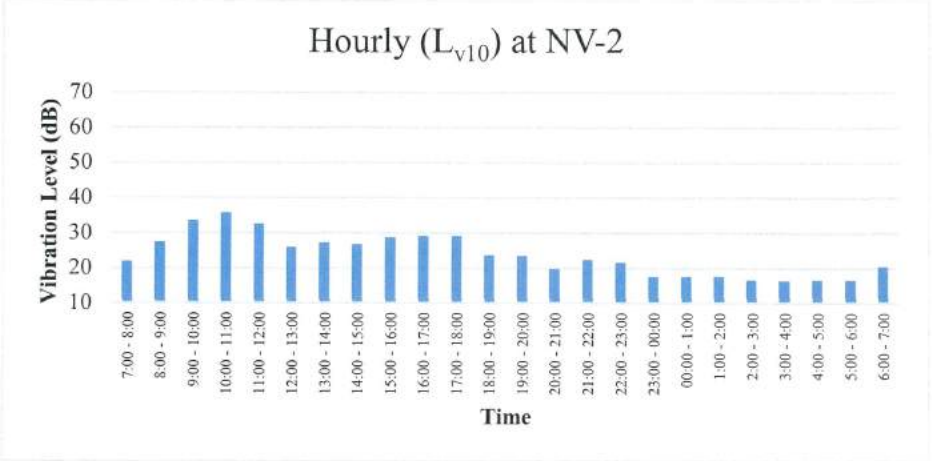

Figure 2.4-7 Results of Vibration Levels (L_{v10}) Monitoring at NV-2

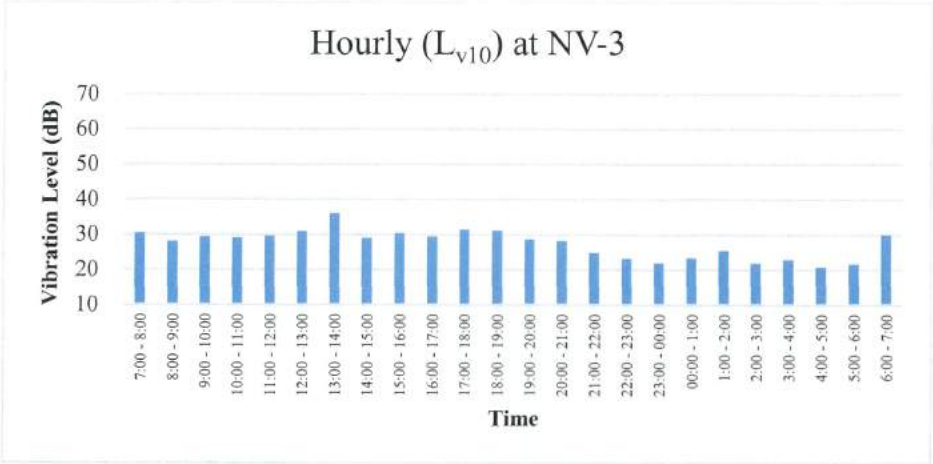

Figure 2.4-8 Results of Vibration Levels (L_{v10}) Monitoring at NV-3

CHAPTER 3: CONCLUSION AND RECOMMENDATION

By comparing with the target noise and vibration level in operation stage in EIA report for Thilawa SEZ development project Zone A, all results were under the target values at NV-1, NV-2, and NV-3. (Referred to section 2.4). As for the detailed analysis of NV-1 on 24 hours, few hours are slightly higher than other time but all results were under the target values. According to the field survey records, the possible noise sources are pass by motorcycles and heavy vehicles, car horn, broadcasting songs by loudspeaker from near villages.

In conclusion of this environmental monitoring, there are no specific noise and vibration impacts to the surrounding area of industrial area of Thilawa SEZ Zone A during this monitoring period.

Thilawa Special Economic Zone (Zone A) Development Project (Operation Phase)

Appendix

General Waste Disposal Record

(Admin Complex Compound- October 2017 to March 2018)

MJTD

Waste Disposal Record

Location : Admin Complex Compound (Trash Room)

Disposal Site : Golden DOWA Eco-system Myanmar Co.,Ltd

Type of Waste : Waste from common area of Thilawa SEZ and Admin complex compound

No	Year	Month	Date	Waste Disposal Time	Weight(Kg)	Total Weight/month
1	2016	March	14-Mar-16	1	320	320
2	2016	April	7-Apr-16	1	600	600
3	2016	June	29-Jun-16	1	1380	1380
4	2016	July	28-Jul-16	1	1000	1000
5	2016	August	31-Aug-16	1	1220	1220
6	2016	October	3-Oct-16	1	1160	2780
7	2016	October	25-Oct-16	1	1620	
8	2016	November	30-Nov-16	1	1120	1120
9	2017	January	5-Jan-17	1	1060	1060
10	2017	February	9-Feb-17	1	680	1440
11	2017	February	10-Feb-17	1	760	
12	2017	March	16-Mar-17	1	960	1680
13	2017	March	17-Mar-17	1	720	
14	2017	April	10-Apr-17	1	960	960
15	2017	May	25-May-17	1	1000	1940
16	2017	May	26-May-17	1	940	
17	2017	June	28-Jun-17	1	1140	1800
18	2017	June	28-Jun-17	1	660	
19	2017	July	25-Jul-17	1	1180	1180
20	2017	August	25-Aug-17	1	1640	2020
21	2017	August	29-Aug-17	1	380	
22	2017	September	20-Sep-17	1	1180	1180
23	2017	October	10-Oct-17	1	1080	1080
24	2017	November	1-Nov-17	1	1140	2180
25	2017	November	29-Nov-17	1	1040	
26	2017	December	12-Dec-17	1	1260	1260
27	2018	January	9-Jan-18	1	820	1400
28	2018	January	16-Jan-18	1	580	
29	2018	February	7-Feb-18	1	960	1720
30	2018	February	23-Feb-18	1	760	
31	2018	March	20-Mar-18	1	1160	2020
32	2018	March	21-Mar-18	1	860	

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

Manifest	C-Slip	*Transportation company to Waste Generator

Date of issuance	(Day Month, Year) 10 10 17	Issuer	(Name&Sign) M/U Min Thein
Number of issuance	1717 1110 0026		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	Myanmar Japan Thilawa Development Ltd	GEM	GEM
Tel			

	Kind	Name	Style of packing
Waste	☐Non-Hazardous	General Waste	
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	10801kg	

Customer code	C001	Waste Profile code	A001

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign) Kyaw Tun Mya	(Day Month, Year)
Waste service company	(Name&Sign)	(Day Month, Year)

Designed by GOLDEN WOWA ECO-SYSTEM MYANMAR CO., LTD.

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED ★ MJTD

Manifest — C-Slip

*Transportation company to Waste Generator

Date of issuance	(Day Month, Year) 1 Nov. 17	Issuer	(Name&Sign)
Number of issuance	[illegible] 0004		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	[illegible]	GEM	GEM
Tel			

Waste	Kind	Name	Style of packing
	☐Non-Hazardous	General Waste	
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	1140 kg	

Customer code	0001	Waste Profile code	A001

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign) [illegible] 2N-6767	(Day Month, Year)
Waste service company	(Name&Sign)	(Day Month, Year)

Designed by GOLDEN WOWA ECO-SYSTEM MYANMAR CO., LTD.

Manifest — C-Slip

*Transportation company to Waste Generator

Date of issuance	(Day Month, Year) 22 Nov. 17	Issuer	(Name&Sign) 22.11.17
Number of issuance	9999 1711 0108		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	Myanmar Japan [illegible]	GEM	GEM
Tel			

Waste	Kind	Name	Style of packing
	☑Non-Hazardous	General Waste	
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	1040 kg	

Customer code	0001	Waste Profile code	A001

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign) Min Oo 3H-8896	(Day Month, Year)
Waste service company	(Name&Sign)	(Day Month, Year)

Designed by GOLDEN WOWA ECO-SYSTEM MYANMAR CO., LTD.

MJTD

Manifest	E-Slip	*Waste service company to Waste Generator

Date of issuance	(Day Month, Year) 12 - Dec - 2017	Issuer	(Name&Sign)
Number of issuance	9999 1712 0051		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	MJTD	GEM	GEM.
Tel			

	Kind	Name	Style of packing
Waste	☒Non-Hazardous	General Waste.	
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	1160 kg	

Customer code	0001	Waste Profile code	A001

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign) Aung Ko Lin	(Day Month, Year) 3.1.2018
Waste service company	(Name&Sign)	(Day Month, Year)

Designed by GOLDEN WOWA ECO-SYSTEM MYANMAR CO., LTD.

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED ★ MJTD

Manifest	C-Slip	*Transportation company to Waste Generator

Date of issuance	(Day Month, Year) 9 Jan 2018	Issuer	(Name&Sign)
Number of issuance	9999 1801 0074		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	Myanmar Japan Thilawa Development Ltd.	GEM	GEM
Tel			

	Kind	Name	Style of packing
Waste	☑Non-Hazardous	General Waste.	
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	820 kg	

Customer code	0001	Waste Profile code	A001

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign) 3K/8896	(Day Month, Year)
Waste service company	(Name&Sign) Khaing	(Day Month, Year)

Designed by GOLDEN WOWA ECO-SYSTEM MYANMAR CO., LTD.

Manifest	E-Slip	*Waste service company to Waste Generator

Date of issuance	(Day Month, Year) 16 JAN 2018	Issuer	(Name&Sign)
Number of issuance	7777 1801 0133		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	Myanmar Japan Thilawa Development Ltd.	GEM	GEM
Tel			

	Kind	Name	Style of packing
Waste	☑Non-Hazardous	General Waste.	
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	820 kg	

Customer code	0001	Waste Profile code	A001

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign)	(Day Month, Year) 22 1. 2. 2018
Waste service company	(Name&Sign)	(Day Month, Year)

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

Designed by GOLDEN WOWA ECO-SYSTEM MYANMAR CO., LTD.

Manifest — C-Slip

*Transportation company to Waste Generator

Date of issuance	(Day Month, Year) 7 FEB 2018	Issuer	(Name&Sign)
Number of issuance	9999 1802 0053		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	Myanmar Japan Thilawa Development Limited	GEM	GEM
Tel			

Waste	Kind	Name	Style of packing
	☑Non-Hazardous	General Waste	
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	960kg	

Customer code	0001	Waste Profile code	A001

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign)	(Day Month, Year)
Waste service company	(Name&Sign)	(Day Month, Year)

Designed by GOLDEN WOWA ECO-SYSTEM MYANMAR CO., LTD.

Manifest — C-Slip

*Transportation company to Waste Generator

Date of issuance	(Day Month, Year) 23 Feb 2018	Issuer	(Name&Sign)
Number of issuance	9999 1802 0166		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	Myanmar Japan Thilawa Development Ltd.	GEM	GEM
Tel			

Waste	Kind	Name	Style of packing
	☑Non-Hazardous	General Waste.	
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	760kg	

Customer code	0001	Waste Profile code	A001

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign)	(Day Month, Year)
Waste service company	(Name&Sign)	(Day Month, Year)

Designed by GOLDEN WOWA ECO-SYSTEM MYANMAR CO., LTD.

MJTD

Manifest | C-Slip

*Transportation company to Waste Generator

Date of issuance	(Day Month, Year) 20 MAR 2018	Issuer	(Name&Sign)
Number of issuance	7777 1205 0117		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	Myanmar Japan Thilawa Development Ltd.	GEM	GEM
Tel			

	Kind	Name	Style of packing
Waste	☐Non-Hazardous	General Waste.	
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	1760 kg	

Customer code	0001	Waste Profile code	A001

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign)	(Day Month, Year)
Waste service company	(Name&Sign) Khaing	(Day Month, Year)

Designed by GOLDEN WOWA ECO-SYSTEM MYANMAR CO., LTD.

Manifest | C-Slip

*Transportation company to Waste Generator

Date of issuance	(Day Month, Year) 21 Mar 2018	Issuer	(Name&Sign)
Number of issuance	7777 1803 0121		

Contractors	Waste generator	Transportation company	Waste service company
Company Name	Myanmar Japan Thilawa Development Ltd.	GEM	GEM
Tel			

	Kind	Name	Style of packing
Waste	☑Non-Hazardous	General Waste	
	☐Hazardous	Quantity(Unit)	Remark
	☐Others	860 kg	

Customer code	0001	Waste Profile code	A001

Trace	PIC(Name&Sign)	Date of Completion
Transportation company	(Name&Sign)	(Day Month, Year)
Waste service company	(Name&Sign)	(Day Month, Year)

Designed by GOLDEN WOWA ECO-SYSTEM MYANMAR CO., LTD.

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

Thilawa Special Economic Zone (Zone A) Development Project (Operation Phase)

Appendix

Ground Subsidence Monitoring Status

(Location- Admin Complex Compound)

October 2017 to March 2018

Ground Subsidence Monitoring Status (Operation Phase)

Location Admin Complex Compound

Coordinate Points E=209545.508 N=1844669.443

Month	Date	Predefined Level (m)-ASL	Weekly Reading Level (m)-ASL	Subsidence (m)	Remark
Jul	15-Jul-16	+7.137	+7.137	0.000	
	22-Jul-16	+7.137	+7.136	-0.001	
	29-Jul-16	+7.137	+7.136	-0.001	
Aug	5-Aug-16	+7.137	+7.136	-0.001	
	12-Aug-16	+7.137	+7.136	-0.001	
	19-Aug-16	+7.137	+7.136	-0.001	
	26-Aug-16	+7.137	+7.136	-0.001	
Sept	2-Sep-16	+7.137	+7.136	-0.001	
	9-Sep-16	+7.137	+7.136	-0.001	
	16-Sep-16	+7.137	+7.136	-0.001	
	23-Sep-16	+7.137	+7.136	-0.001	
	30-Sep-16	+7.137	+7.136	-0.001	
Oct	7-Oct-16	+7.137	+7.136	-0.001	
	14-Oct-16	+7.137	+7.136	-0.001	
	21-Oct-16	+7.137	+7.136	-0.001	
	28-Oct-16	+7.137	+7.136	-0.001	
Nov	4-Nov-16	+7.137	+7.136	-0.001	
	11-Nov-16	+7.137	+7.136	-0.001	
	18-Nov-16	+7.137	+7.136	-0.001	
	25-Nov-16	+7.137	+7.138	+0.001	
Dec	2-Dec-16	+7.137	+7.136	-0.001	
	9-Dec-16	+7.137	+7.136	-0.001	
	16-Dec-16	+7.137	+7.135	-0.002	
	23-Dec-16	+7.137	+7.133	-0.004	
	30-Dec-16	+7.137	+7.133	-0.004	
Jan	6-Jan-17	+7.137	+7.134	-0.003	
	13-Jan-17	+7.137	+7.134	-0.003	
	20-Jan-17	+7.137	+7.134	-0.003	
	27-Jan-17	+7.137	+7.134	-0.003	
Feb	3-Feb-17	+7.137	+7.134	-0.003	
	10-Feb-17	+7.137	+7.134	-0.003	
	17-Feb-17	+7.137	+7.134	-0.003	
	24-Feb-17	+7.137	+7.134	-0.003	
Mar	3-Mar-17	+7.137	+7.134	-0.003	
	10-Mar-17	+7.137	+7.134	-0.003	
	17-Mar-17	+7.137	+7.128	-0.009	After earthquake
	24-Mar-17	+7.137	+7.128	-0.009	
	31-Mar-17	+7.137	+7.128	-0.009	
Apr	7-Apr-17	+7.137	+7.128	-0.009	
	21-Apr-17	+7.137	+7.126	-0.011	
	28-Apr-17	+7.137	+7.126	-0.011	
May	5-May-17	+7.137	+7.126	-0.011	
	12-May-17	+7.137	+7.129	-0.008	
	19-May-17	+7.137	+7.131	-0.006	
	26-May-17	+7.137	+7.135	-0.002	

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

Month	Date	Predefined Level (m)-ASL	Weekly Reading Level (m)-ASL	Subsidence (m)	Remark
Jun	9-Jun-17	+7.137	+7.135	-0.002	
	16-Jun-17	+7.137	+7.134	-0.003	
	23-Jun-17	+7.137	+7.134	-0.003	
	30-Jun-17	+7.137	+7.136	-0.001	
July	7-Jul-17	+7.137	+7.136	-0.001	
	14-Jul-17	+7.137	+7.136	-0.001	
	21-Jul-17	+7.137	+7.138	+0.001	
	28-Jul-17	+7.137	+7.136	-0.001	
Aug	3-Aug-17	+7.137	+7.136	-0.001	
	10-Aug-17	+7.137	+7.137	+0.000	
	17-Aug-17	+7.137	+7.136	-0.001	
	24-Aug-17	+7.137	+7.137	+0.000	
Sept	1-Sep-17	+7.137	+7.136	-0.001	
	8-Sep-17	+7.137	+7.136	-0.001	
	15-Sep-17	+7.137	+7.136	-0.001	
	22-Sep-17	+7.137	+7.136	-0.001	
	29-Sep-17	+7.137	+7.136	-0.001	
Oct	2-Oct-17	+7.137	+7.136	-0.001	
	9-Oct-17	+7.137	+7.136	-0.001	
	16-Oct-17	+7.137	+7.136	-0.001	
	23-Oct-17	+7.137	+7.136	-0.001	
	30-Oct-17	+7.137	+7.136	-0.001	
Nov	6-Nov-17	+7.137	+7.136	-0.001	
	13-Nov-17	+7.137	+7.136	-0.001	
	20-Nov-17	+7.137	+7.135	-0.002	
	27-Nov-17	+7.137	+7.135	-0.002	
Dec	4-Dec-17	+7.137	+7.135	-0.002	
	11-Dec-17	+7.137	+7.135	-0.002	
	18-Dec-17	+7.137	+7.134	-0.003	
	26-Dec-17	+7.137	+7.134	-0.003	
Jan	2-Jan-18	+7.137	+7.134	-0.003	
	8-Jan-18	+7.137	+7.133	-0.004	
	15-Jan-18	+7.137	+7.133	-0.004	
	22-Jan-18	+7.137	+7.132	-0.005	
	29-Jan-18	+7.137	+7.132	-0.005	
Feb	5-Feb-18	+7.137	+7.132	-0.005	
	13-Feb-18	+7.137	+7.132	-0.005	
	19-Feb-18	+7.137	+7.132	-0.005	
	26-Feb-18	+7.137	+7.132	-0.005	
Mar	5-Mar-18	+7.137	+7.132	-0.005	
	12-Mar-18	+7.137	+7.132	-0.005	
	19-Mar-18	+7.137	+7.132	-0.005	
	26-Mar-18	+7.137	+7.130	-0.007	

Thilawa Special Economic Zone (Zone A) Development Project (Operation Phase)

Appendix

Sewage Treatment Plant Monitoring Record

October 2017 to March 2018

Monitoring Parameters Result for STP(Phase-1)

Inlet

Month	Date	pH	ORP	DO	EC	TDS	Turbidity	COD	Temp	BOD	T-Coli	T-N	T-P	O&G	SS
		Daily Parameters								Weekly Parameters					
Standard		5.5-8.5	-	-	-	Max 2,000	-	Max 300	Max 35 °C	Max 200	Max 400	Max 80	-	Max 5	Max 200
Unit		-	mv	mg/L	µs/cm	ppm	FNU	ppm	°C	ppm	MPN/100ml	ppm	ppm	ppm	ppm
Oct	1-Oct-17														
Oct	2-Oct-17	[illegible]	292.6	2.96	535	267	24.3	164	29.89						
Oct	3-Oct-17	[illegible]	329.5	4.03	509	255	25.7	266	30.19						
Oct	4-Oct-17														
Oct	5-Oct-17														
Oct	6-Oct-17														
Oct	7-Oct-17														
Oct	8-Oct-17														
Oct	9-Oct-17	[illegible]	437	4.61	485	243	16.2	62	29.64						
Oct	10-Oct-17	[illegible]	385	3.53	502	247	8.9	92	29.92						
Oct	11-Oct-17	5.96	370.8	3.35	323	160	57.9	43	29.32	17.3	>160000	7	0.754	8	98
Oct	12-Oct-17	6.13	338.1	3.28	386	193	11.5	60	29.68						
Oct	13-Oct-17	6.16	324.5	4.7	473	237	62.2	140	29.83						
Oct	14-Oct-17														
Oct	15-Oct-17														
Oct	16-Oct-17	6.1	385.4	4.24	430	231	65.3	48	29.72						
Oct	17-Oct-17	6.06	332.2	4.01	406	203	21.5	34	29.3	12.05	>160000	4	0.665	3.45	50
Oct	18-Oct-17														
Oct	19-Oct-17	6.24	135.6	4.45	501	250	52.2	196	29.64						
Oct	20-Oct-17	6.38	254.2	5.5	796	395	28.6	108	29.66						
Oct	21-Oct-17														
Oct	22-Oct-17														
Oct	23-Oct-17	6.43	170.1	5.5	473	237	66.8	96	29.64						
Oct	24-Oct-17	6.77	340.3	4.75	671	336	38.3	34	29.72	7	>160000	9	0.703	4.2	20
Oct	25-Oct-17	6.42	336.4	4.4	444	267	18.9	40	29.79						
Oct	26-Oct-17	6.38	392.3	3.6	460	224	28.9	88	29.57						
Oct	27-Oct-17	6.51	378.9	3.51	556	250	23.2	150.5	29.91						
Oct	28-Oct-17														
Oct	29-Oct-17														
Oct	30-Oct-17	6.6	334.1	3.34	525	263	21.3	Not run	29.73						
Oct	31-Oct-17	4.49	387.6	4.39	521	260	7.8	84	29.74	5.4	23	8	0.192	5.82	22
Nov	1-Nov-17	6.7	340	3.65	726	362	10	[illegible]	29.9						
Nov	2-Nov-17	6.12	359.6	4.58	987	566	54.1		29.82						
Nov	3-Nov-17	6.15	425.1	4.59	445	247	11.9		29.55						
Nov	4-Nov-17	6.35	374.3	4.01	756	378	12.4		29.62						
Nov	5-Nov-17	6.35	399.2	4.37	860	424	6.9		29.72						
Nov	6-Nov-17	6.04	386.1	4.08	1241	620	9.3	186	29.5						
Nov	7-Nov-17	5.29	442.8	5.61	558	279	24.2	73	29.8	26.6	[illegible]	10.3	0.651	4.4	44
Nov	8-Nov-17	6.47	292.3	3.55	718	360	14.6	37	29.8						
Nov	9-Nov-17	6.7	302.1	3.9	479	239	14.6	16	29.4						
Nov	10-Nov-17	6.75	284.2	3.27	612	311	16.5	58	30.09						
Nov	11-Nov-17	6.74	317.7	4.99	482	241	8.8		30.06						
Nov	12-Nov-17	6.23	339.6	2.57	928	467	20.7		29.64						
Nov	13-Nov-17	6.5	336.5	5.83	715	356	64.1		29.75						
Nov	14-Nov-17	6.69	379.2	3.66	678	348	12.5	26	29.58						
Nov	15-Nov-17	6.67	357.6	6.75	767	384	2.1	28	29.59	7.11	[illegible]	8.1	0.441	4.55	22
Nov	16-Nov-17	6.96	214.2	5.16	660	136	7.8	24	30.13						
Nov	17-Nov-17	4.68	311.5	5.53	894	447	24.4	146	30.23						
Nov	18-Nov-17	6.09	253.3	2.7	798	398	19.3		30.11						
Nov	19-Nov-17	6.45	319.6	3.41	765	383	8.2		29.95						
Nov	20-Nov-17	6.68	362.2	4	864	432	9.2	87	29.89						
Nov	21-Nov-17	6.09	283.3	4.57	845	422	6.1	42	30.02						
Nov	22-Nov-17	6.53	424.8	5.12	598	340	27.4	74	29.64	22.1	[illegible]	19.5	1.4	[illegible]	80
Nov	23-Nov-17	6.71	339.8	5.2	720	364	22.9	182	30						
Nov	24-Nov-17	6.6	277.2	4.09	610	319	11.2	24.6	30.08						
Nov	25-Nov-17	6.6	372.2	4	972	430	9.2		30						
Nov	26-Nov-17	6.7	312.8	3.21	1730	364	43.6		30.26						
Nov	27-Nov-17	6.98	314.8	5.15	738	368	53	58	30.07						
Nov	28-Nov-17	6.64	288	5.73	679	340	14.5	42	29.97						
Nov	29-Nov-17	6.56	305.1	5.14	673	298	12.3	29	29.99	7.2	[illegible]	9	0.226	<3.1	16
Nov	30-Nov-17	6.39	151.3	5.66	634	318	17.8	21	29.96						
Dec	1-Dec-17	6.64	380.2	3.48	866	434	9	76	29.68						
Dec	2-Dec-17	7.82	233.5	4.09	1034	517	25.6		29.86						
Dec	3-Dec-17	6.65	224.6	4.02	975	488	15.6		29.64						
Dec	4-Dec-17	4.76	386.3	4.28	1473	741	19.6	[illegible]	29.75						
Dec	5-Dec-17	6.92	343.5	5.62	725	371	19.8	87	29.46	20	[illegible]	22.2	1.94	[illegible]	50
Dec	6-Dec-17	6.8	258.6	4.97	1059	529	18.3	39	79.82						
Dec	7-Dec-17	6.64	219.4	4.78	1204	448	16.8	39	29.66						
Dec	8-Dec-17	6.81	347.7	3.21	488	244	10.7	61	29.98						
Dec	9-Dec-17	6.88	311.7	5.26	419	210	11.3		29.9						
Dec	10-Dec-17	6.8	296.9	4.36	620	310	15.8		29.93						
Dec	11-Dec-17	6.82	294.9	5.12	774	424	19.8	53	30.01						
Dec	12-Dec-17	7.34	231.5	3.81	791	395	12.5	55	30.05						
Dec	13-Dec-17	7.14	279.3	4.36	1068	533	7.4		30.02						
Dec	14-Dec-17	Temporary stoped for tank cleaning (13.12.2017 to 25.12.2017)													
Dec	15-Dec-17	12	314.8	3.54	1014	498	6.6		29.57						
Dec	16-Dec-17	2018	285.7	3.42	1043	522	6.5		30.01						
Dec	17-Dec-17	7.09	277.9	3.36	868	433	11.1		29.15						
Dec	18-Dec-17														
Dec	19-Dec-17	7	301.5	3.4	424	212	10.4		28.86						
Dec	20-Dec-17	6.84	320.6	3.22	679	340	8.7		28.99						
Dec	21-Dec-17	5.58	339.9	4.23	991	495	5.3		28.83						
Dec	22-Dec-17	7.21	287.8	3.58	561	280	7.2		28.61						
Dec	23-Dec-17	7.08	165.2	5.13	770	386	28.4		28.96						
Dec	24-Dec-17	7.15	198.8	5.4	796	362	19.9		28.76						
Dec	25-Dec-17	6.56	259.9	4.36	598	299	11.7		28.63						
Dec	26-Dec-17	6.9	297.8	3.71	626	313	46.1	19	29.07						
Dec	27-Dec-17	6.83	327.7	4.69	515	257	26.9	22	29.11	3.16	>160000	8.7	1.12	4.4	16
Dec	28-Dec-17	7.58	290.9	7.36	728	384	15.3	47	27.64						
Dec	29-Dec-17	6.92	169.7	5.13	465	233	6.5	14	28.94						
Dec	30-Dec-17	6.99	242.5	4.13	563	281	14.1		29.06						
Dec	31-Dec-17	7.08	182.4	4.76	682	342	31.7		29.02						
Jan	1-Jan-18	7.06	298.6	4.63	731	369	26.5		28.65						
Jan	2-Jan-18	6.24	330.1	3.63	708	354	4.7	Not run	28.85						
Jan	3-Jan-18	6.81	288.2	4.8	686	343	23.8		28.76						
Jan	4-Jan-18	7.01	291	5.04	726	351	22.7		29.04						
Jan	5-Jan-18	7.03	310.3	4.96	734	358	23.2	31	29.06						
Jan	6-Jan-18	6.5	329.7	4.4	852	426	16		28.89						
Jan	7-Jan-18	7.01	331.2	5.02	835	532	14.2		27.32						
Jan	8-Jan-18	7.04	360.1	4.4	502	253	8.6	19	29.3						
Jan	9-Jan-18	7.08	328.7	5.52	660	330	15.1	17	29.83						
Jan	10-Jan-18	7.13	247.3	3.63	737	367	18	41	29.69	17.28	[illegible]	13.4	1.59	3.27	48
Jan	11-Jan-18	Battery Shut down						61							
Jan	12-Jan-18	6.92	298.4	4.38	676	339	25.6	44	29.62						
Jan	13-Jan-18	7.09	326.6	4.36	740	349	14.2		29.72						
Jan	14-Jan-18	5.47	320.1	4.1	637	320	11.9		28.63						
Jan	15-Jan-18	6.6	235.3	5.03	590	298	9.5	Not run	26.92						
Standard		6 – 9	-	-	-	Max 2,000	-	Max 400	Max 35 °C	Max 200	-	Max 80	Max8	Max 40	Max 200
Unit		-	mv	mg/L	µs/cm	ppm	FNU	ppm	°C	ppm	MPN/100ml	ppm	ppm	ppm	ppm
Jan	16-Jan-18	6.54	173.1	ju	1925	977	10.6		29.24						
Jan	17-Jan-18	7.16	287.1	5.65	1159	578	86	55	29.04	13.66	>160000	9.7	9.13	5.45	50
Jan	18-Jan-18	[illegible]	366.4	4.05	650	325	16.1	24	28.91						
Jan	19-Jan-18	6.64	307.5	2.6	720	360	6.1	22.5	28.2						
Jan	20-Jan-18														
Jan	21-Jan-18	6.7	390.2	2.6	762	356	14.1		28.52						
Jan	22-Jan-18	6.98	339.5	3.58	706	354	40.9	19	28.77						
Jan	23-Jan-18	7.06	342	3.71	713	356	13.4	80	28.87						
Jan	24-Jan-18	7.07	197.4	4.01	929	466	18.5	31	28.95	28.94	>160000	8.9	2.07	3.2	14
Jan	25-Jan-18	7.06	333.1	4.81	683	351	8.2	52	29.1						
Jan	26-Jan-18	[illegible]	371.1	4.81	1739	890	26.5	82	29.01						
Jan	27-Jan-18	6.75	363.6	4.44	695	348	9.3		28.94						
Jan	28-Jan-18	6.81	386.7	4.27	1201	581	14.4		28.87						
Jan	29-Jan-18							68							
Jan	30-Jan-18	6.87	398.6	4.76	1059	529	10.5	55	28.5						
Jan	31-Jan-18	6.97	296.6	4.68	599	299	9.9	47	28.52	12.49	>160000	22	2.33	3.4	12

Monthly Parameters (Inlet; all other dates blank)

Month	Date	Cyanide	Chromium	Arsenic	Mercury	Cadmium	Selenium	Lead	Color	Odor	Zinc	Copper	Barium	Nickel	Sulphide	Free Chlorine	Formal-dehyde	Silver	Iron	Ammonia	Hexavalent Chromium(Cr6+)	Fluoride	Total Chlorine	Total Cyanide	Total Heavy Metals	Phenols
Standard		Max 0.2	Max 0.5	Max 0.25	Max 0.001	Max 0.03	Max 0.02	Max 0.2	150	150	Max 5	Max 1	Max 1	Max 0.2	Max 1	Max 1	Max 1	Max0.5	Max3.5	Max80	Max0.1	Max20	Max0.2			Max 1
Unit		ppm	ppm	ppm	ppm	ppm	ppm	ppm	Co-Pt	Co-Pt	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Oct	11-Oct-17	0.032	≤0.002	≤0.01	≤0.002	≤0.001	≤0.01	≤0.002	7.26	1.4	0.022	≤0.002	0.018	0.026	0.056	1.1										
Nov	7-Nov-17	0.021	0.017	≤0.01	≤0.002	≤0.001	≤0.01	≤0.002	10.65	8	0.065	0.011	0.005	0.018	0.01	0.1	0.231									<0.002
Dec	5-Dec-17	0.008	≤0.002	≤0.01	≤0.002	≤0.001	≤0.01	≤0.002	26.65	2	0.014	≤0.002	0.03	0.006	0.055	<0.1	0.057	≤0.002	1.84	<0.015	<0.05	2.078	0.1			0.016
Standard		Max 0.1	Max 0.5	Max 0.1	Max 0.005	Max 0.03	Max 0.02	Max 0.1	150	150	Max 2	Max 0.5	Max 1	Max 0.2	Max 1	Max 1	Max 1	Max1.5	Max3.5	Max80	Max0.1	Max20	Max0.2	Max1	Max10	Max 0.5
Unit		ppm	ppm	ppm	ppm	ppm	ppm	ppm	Co-Pt	Co-Pt	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Jan	17-Jan-18																						0.1			
Jan	24-Jan-18																						<0.1			
Jan	31-Jan-18																						<0.1			

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Standard		6 ~ 9	-	-	-	Max 2,500	-	Max 400	Max 36 °C	Max 200	-	Max 80	Max 8	Max 40	Max 200	Max 0,1	Max 0,5	Max 0,1	Max 0,005	Max 0,03	Max 0,03	Max 0,1	150	150	Max 2	Max 0,5	Max 1	Max 0,2	Max 1	Max 1	Max 1	Max0,5	Max3,6	Max80	Max0,1	Max20	Max0,2	Max1	Max10	Max 0,5
Unit		-	mv	mg/L	µs/cm	ppm	FNU	ppm	°C	ppm	MPN/100ml	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	Co-Pt	Co-Pt	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Feb	1-Feb-18	6.8	379.1	3.87	536	310	24	46	27.87																														
Feb	2-Feb-18	6.84	327.8	3.75	547	331	18.9	52	28.09																														
Feb	3-Feb-18	6.98	354.9	4.18	650	324	11.1		28.55																														
Feb	4-Feb-18	7.01	295.4	3.78	619	310	23		28.74																														
Feb	5-Feb-18	6.95	311.4	4.28	684	342	13	38	28.6																														
Feb	6-Feb-18	6.7	302.5	4.8	1050	524	10.5	58	28.91																														
Feb	7-Feb-18	6.93	374.3	5.27	938	466	16.4	44	29.09	13.38	>160000	24.1	2.33	3.6	12	0.004	≤0.002	≤0.01	≤0.002	≤0.001	≤0.01	≤0.002	38.77	1.4	0.016	≤0.002	0.014	0.002	0.037	<0.1	0.133	≤0.002	0.602	3.37	<0.05	0.798	0.1			0.002
Feb	8-Feb-18	6.89	322.6	4.89	1181	590	6.1	24	28.98																														
Feb	9-Feb-18	7.01	315	4.84	858	923	423	42	28.95																														
Feb	10-Feb-18	7.21	318.4	5.08	999	528	22.2		28.72																														
Feb	11-Feb-18	7	327.7	3.85	1004	501	29.3		28.98																														
Feb	12-Feb-18	6.81	319.1	4.21	571	286	22.3		28.95																														
Feb	13-Feb-18	7.09	315.1	3.97	890	441	18.4	27	28.84																														
Feb	14-Feb-18	7.46	303.4	5.15	1260	632	25.6	54	29.34	24.8	>160000	11.2	1.14	4.2	38																						0.1			
Feb	15-Feb-18	7.65	333.7	4.58	1244	620	31.7	41	29.3																														
Feb	16-Feb-18	7.23	333.5	3.99	728	364	19.3	31	29.11																														
Feb	17-Feb-18	7.13	324.2	4.44	837	420	27.9		29.17																														
Feb	18-Feb-18	7.2	328.7	4.82	920	393	28.1		29.2																														
Feb	19-Feb-18	6.95	302.5	5.2	948	462	18.1	50	29.09																														
Feb	20-Feb-18	7.13	318.7	5.16	867	433	14.3	44	28.71																														
Feb	21-Feb-18	7.05	225	5.52	814	421	20.3	57	29.14	46.3	>160000	18.7	1.74	3.64	18																						0.1			
Feb	22-Feb-18	7.19	296.8	5.22	829	418	16.5	42	29.22																														
Feb	23-Feb-18	7.42	322.3	5.08	837	466	18.3	85	29.28																														
Feb	24-Feb-18	7.14	337	3.71	1189	595	17.9		29.63																														
Feb	25-Feb-18	7.6	302.1	5.04	191	486	16.6		29.73																														
Feb	26-Feb-18	7.26	319.2	5.09	522	532	18.2	72	29.2																														
Feb	27-Feb-18	7.21	317.4	4.32	536	441	10.9	58	29.34																														
Feb	28-Feb-18	7.15	297.2	4.66	747	373	13.4	43	29.4	34.86	>160000	17.6	1.32	4.2	16																						<0.1			
Mar	1-Mar-18	7.14	295.7	5.19	438	219	8.3		29.66																														
Mar	2-Mar-18	7.15	288.6	5.23	428	223	8.3		29.2																														
Mar	3-Mar-18	7.16	293.6	5.21	418	218	9.3		27.56																														
Mar	4-Mar-18	7.09	231.2	4.71	825	413	10.7		29.31																														
Mar	5-Mar-18	4.63	367.4	4.66	900	449	29	149	29.33																														
Mar	6-Mar-18	6.82	312.5	4.52	863	420	10.3	60	29.34																														
Mar	7-Mar-18	7.17	298.3	5.31	794	432	8.4	85	29.28	34.41	>160000	20	1.73	6.6	8	<0.002	≤0.002	≤0.01	≤0.002	≤0.001	≤0.01	≤0.002	24.51	1	≤0.002	≤0.002	0.022	0.002	0.04	0.1	0.102	≤0.002	0.068	19.5	<0.05	3.751	0.2			<0.002
Mar	8-Mar-18	5.37	401	6.34	819	410	5.9	55	29.29																														
Mar	9-Mar-18	6.97	180.5	5.5	800	403	17.6	45	29.85																														
Mar	10-Mar-18	6.6	294.3	4.25	1054	534	12.6		30.06																														
Mar	11-Mar-18	7.08	231.3	4.78	1001	447	10.5		29.97																														
Mar	12-Mar-18	7.09	262.3	4.41	1301	650	12.8	40	29.98																														
Mar	13-Mar-18	7.08	268.4	5.14	831	304	7.5	40	29.66																														
Mar	14-Mar-18	6.76	283.6	5.03	1236	592	32.7	47	29.99	9.3	>160000	23.1	2.11	3.2	16																						0.1			
Mar	15-Mar-18	7.16	112.3	3	1051	525	57	56	29.66																														
Mar	16-Mar-18	6.92	282.4	4.75	501	250	10.2	44	30.06																														
Mar	17-Mar-18	7.05	270.5	4.47	1200	603	15.9		30.19																														
Mar	18-Mar-18	6.69	279.3	4.52	1240	582	12.9		30.08																														
Mar	19-Mar-18	6.82	286.5	5.31	1089	534	12.3	24	30.06																														
Mar	20-Mar-18	5.86	322.5	4.97	826	413	44.1	51	29.99																														
Mar	21-Mar-18	6.9	298	3.7	760	380	30.6	49	30.08	20.25	>160000	11.4	0.817	4	28																						0.1			
Mar	22-Mar-18	6.92	288.3	4.42	892	394	29	34	30.06																														
Mar	23-Mar-18	6.69	275.4	4.75	911	406	12.8	32	30.17																														
Mar	24-Mar-18	6.8	280.7	4.87	923	462	21.8		29																														
Mar	25-Mar-18	6.34	323.7	4.6	782	395	40.8		30.29																														
Mar	26-Mar-18	6.51	278.6	4.2	612	417	14.2	52	30.03																														
Mar	27-Mar-18	6.85	338.7	1.44	785	392	6.3		28.34																														
Mar	28-Mar-18	6.87	298.2	4.75	579	340	12.1	64	29.53	18.34	>160000	18.5	1.49	3.64	24																						0.1			
Mar	29-Mar-18	6.98	287.4	4.23	763	408	11.4	32	29.01																														
Mar	30-Mar-18	6.96	289.5	4.46	753	382	16.7	24	29.43																														
Mar	31-Mar-18	7.34	288.7	250	1050	525	25.5		30.12																														

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED MJTD

Monitoring Parameters Result for STP(Phase-1)

Outlet

Month	Date	pH	ORP	DO	EC	TDS	Turbidity	COD	Temp	BOD	T-Coli	T-N	T-P	O&G	SS
		Daily Parameters								Weekly Parameters					
Standard		6.0 - 9.0	-	-	-	Max 2,000	-	Max 70	Max 40	Max 20	Max 400	Max 5	Max 2	Max 8	Max 30
Unit		-	mv	mg/L	µs/cm	ppm	FNU	ppm	°C	ppm	MNP/100ml	ppm	ppm	ppm	ppm
Oct	1-Oct-17														
Oct	2-Oct-17							6							
Oct	3-Oct-17	6.66	366.2	6.01	464	233	2.3	< 0.7	29.83						
Oct	4-Oct-17														
Oct	5-Oct-17														
Oct	6-Oct-17														
Oct	7-Oct-17														
Oct	8-Oct-17														
Oct	9-Oct-17	5.13	601.2	5.94	494	247	1.8	0.8	29.72						
Oct	10-Oct-17	5.87	364.7	5.56	549	275	1.8	2.6	30.22						
Oct	11-Oct-17	6.18	332.9	5.45	526	263	8.2	4.6	29.67	1.02	<1.8	4	0.204	<3.1	16
Oct	12-Oct-17	5.79	451.7	5.79	545	273	22.5	7.8	29.64						
Oct	13-Oct-17	6.52	335.3	5.19	507	254	2	4	29.8						
Oct	14-Oct-17														
Oct	15-Oct-17														
Oct	16-Oct-17	6.24	382.3	5.34	513	256	1.9	4.7	29.69						
Oct	17-Oct-17	6.38	282.5	4.71	501	250	9.5	5.4	29.84	1.96	<1.8	0	0.281	<3.1	14
Oct	18-Oct-17														
Oct	19-Oct-17	6.9	492.6	6.62	463	231	12.9	3.1	29.25						
Oct	20-Oct-17	6.86	307	6.29	505	253	26.8	5.8	29.24						
Oct	21-Oct-17														
Oct	22-Oct-17														
Oct	23-Oct-17	6.64	354.4	6.59	479	240	2.7	3	29.91						
Oct	24-Oct-17	7.1	360	6.58	453	228	10	3.8	29.8	2	<1.8	6	0.13	<3.1	6
Oct	25-Oct-17	6.54	389.4	4.89	490	247	9.6	3.6	29.59						
Oct	26-Oct-17	6	369.8	6.08	421	265	2.9	3	29.48						
Oct	27-Oct-17	6.72	339.6	5.36	490	225	7.8	3.3	29.87						
Oct	28-Oct-17														
Oct	29-Oct-17														
Oct	30-Oct-17	6.63	357.6	6.05	560	280	3	Not run	29.47						
Oct	31-Oct-17	6.5	358.1	5.81	569	284	2.8	23.8	29.71	3.63	<1.8	11	0.103	<3.1	6
Nov	1-Nov-17	6.57	367.6	5.8	720	361	2	9.8	29.63						
Nov	2-Nov-17	5.78	428.2	6.32	923	461	1.7		29.89						
Nov	3-Nov-17	5.99	412	6.03	933	466	12		29.38						
Nov	4-Nov-17	6.4	487.7	5.66	899	450	4.4		29.48						
Nov	5-Nov-17	6.27	401.2	5.78	920	460	5.9		29.38						
Nov	6-Nov-17	6.64	356.5	5.86	913	460	4.9	6.1	29.22						
Nov	7-Nov-17	6.25	445.4	6.04	1021	510	2.8	2.2	28.81	0.1	<1.8	7.4	0.074	<3.1	6
Nov	8-Nov-17	6.59	367.7	4.96	943	472	2	4.4	29.34						
Nov	9-Nov-17	6.67	393.8	5.56	916	458	2.4	3.7	29.43						
Nov	10-Nov-17	6.84	357.8	5.26	869	434	1.8	1.1	29.34						
Nov	11-Nov-17	6.77	340.5	5.43	814	407	8.2		29.63						
Nov	12-Nov-17	6.93	337.9	4.85	772	386	3.4		29.51						
Nov	13-Nov-17	6.59	335.4	6.54	752	377	2.1		19						
Nov	14-Nov-17	6.48	386.6	4.41	767	384	4.1	3.1	29.1						
Nov	15-Nov-17	6.67	357.6	6.75	767	384	2.1	3.6	29.59	2.04	<1.8	7	0.074	<3.1	6
Nov	16-Nov-17	7.74	272.2	6.78	751	376	2.1	6.8	29.48						
Nov	17-Nov-17	6.36	389.8	6.18	788	394	1.8	4.6	29.62						
Nov	18-Nov-17	6.48	303.5	5.02	949	475	2		29.83						
Nov	19-Nov-17	6.71	373.6	5.76	951	476	2.1		29.91						
Nov	20-Nov-17	6.62	337.6	6.9	939	470	3.1	3.1	30.01						
Nov	21-Nov-17	6.52	384.3	6.44	999	500	2.3	2	29.54						
Nov	22-Nov-17	6.88	473.4	6.12	991	492	4.7	1.3	29.79	0	<1.8	[illegible]	0.075	<3.1	6
Nov	23-Nov-17	6.97	318.2	6.77	1025	517	5.2	2.7	29.22						
Nov	24-Nov-17	6.76	334.8	6.6	1023	512	4.1	5.5	29.3						
Nov	25-Nov-17	6.47	352.2	4.32	846	447	8.6		29.99						
Nov	26-Nov-17	6.86	309	5.43	1023	512	3.2		29.44						
Nov	27-Nov-17	6.95	321.5	6.3	1037	519	3.1	0.7	29.29						
Nov	28-Nov-17	6.59	337	7.01	973	389	5.9	0.9	29.89						
Nov	29-Nov-17	6.84	354.6	6.32	932	491	4.3	3.4	30.08	0	<1.8	[illegible]	0.103	<3.1	6
Nov	30-Nov-17	6.9	292.9	6.2	868	433	6.9	5	29.5						
Dec	1-Dec-17	6.89	365.1	6.81	853	426	26.4	9.6	29.08						
Dec	2-Dec-17	6.67	362.1	5.78	867	434	2.1		28.96						
Dec	3-Dec-17	6.92	313.9	6.95	961	458	2.7		28.74						
Dec	4-Dec-17	4.38	426.5	5.8	1054	527	2.3	<0.7	28.6						
Dec	5-Dec-17	6.67	338.8	6.82	1153	578	6.7	10.6	28.86	1.13	<1.8	9.3	0.102	<3.1	12
Dec	6-Dec-17	6.94	354.7	5.3	1094	548	2.4	1.8	28.84						
Dec	7-Dec-17	6.67	343.6	6.39	1012	359	2.3	1.7	29.14						
Dec	8-Dec-17	6.91	343.3	5.95	1044	522	3.4	1.3	28.82						
Dec	9-Dec-17	7.01	323.5	6.54	974	487	3.4		28.92						
Dec	10-Dec-17	7.1	333.6	6.43	848	424	3.6		29.16						
Dec	11-Dec-17	7.23	364.2	6.39	942	531	2.9	2.9	28.27						
Dec	12-Dec-17	7.51	219	6.41	808	404	4	2.6	27.25						
Dec	13-Dec-17	7.43	185.2	6.93	821	411	8		28.84						
Dec	14-Dec-17	Temporary stoped for tank cleaning (13.12.2017 to 25.12.2017)													
Dec	15-Dec-17	7.2	343.5	6.24	824	413	4.2		28.13						
Dec	16-Dec-17	7.1	282.7	6.22	901	418	6.5		29.18						
Dec	17-Dec-17	7.06	284.2	5.2	828	414	3.7		27.3						
Dec	18-Dec-17														
Dec	19-Dec-17	7.15	307.2	5.9	828	415	3.8		26.17						
Dec	20-Dec-17	6.99	322.7	5.57	826	414	2.9		26.76						
Dec	21-Dec-17	6.42	340.9	6.1	806	400	2.8		25.61						
Dec	22-Dec-17	7.25	328.3	6.19	802	396	2.9		25						
Dec	23-Dec-17	6.97	364.8	7.45	828	414	9.3		26.59						
Dec	24-Dec-17	7.5	339.6	7.6	848	416	9.2		25.66						
Dec	25-Dec-17	6.85	470.3	6.61	768	384	14		27.14						
Dec	26-Dec-17	6.78	456.8	5.85	710	355	5.2	5.6	27.32						
Dec	27-Dec-17	6.87	532.7	7.09	691	346	5.4	14.2	27.75	3.18	<1.8	7.8	0.092	<3.1	2
Dec	28-Dec-17	7	130.5	7.18	561	281	59.2	16.9	29.13						
Dec	29-Dec-17	7.25	316.4	6.75	727	364	5.6	5.6	27.96						
Dec	30-Dec-17	6.94	323.1	6.78	732	366	11.9		27.78						
Dec	31-Dec-17	7.17	313.6	7.37	737	368	4.2		27.87						
Jan	1-Jan-18	7.3	317.5	7.2	736	369	5.3		27.78						
Jan	2-Jan-18	7.35	301.9	6.65	736	368	4.3	Not run	27.21						
Jan	3-Jan-18	7.29	291.2	6.62	736	368	4.7		26.8						
Jan	4-Jan-18	7.34	286.4	7.02	746	401	5.1		28.64						
Jan	5-Jan-18	7.4	295.3	7.06	749	395	4.1	5.1	28.55						
Jan	6-Jan-18	6.92	360.6	6.19	774	387	5.3		27.12						
Jan	7-Jan-18	6.8	285.5	7.5	786	368	4.3		28.19						
Jan	8-Jan-18	6.99	388.8	6.07	685	727	343	2.3	28.21						
Jan	9-Jan-18	6.98	404.6	6.86	7.41	370	3	4.1	28.76						
Jan	10-Jan-18	6.94	337.5	6.41	752	377	6.8	6.5	28.77	4.5	<1.8	10.2	0.091	<3.1	6
Jan	11-Jan-18	Battery Shut down						6.2							
Jan	12-Jan-18	7.02	317.4	5.56	753	416	3.6	7.1	27.92						
Jan	13-Jan-18	6.92	389.5	6.52	7.53	380	6.5		28.24						
Jan	14-Jan-18	5.79	310.7	6.8	746	372	5		27.75						
Jan	15-Jan-18	6.97	267.3	5.82	737	368	6.2	Not run	27.39						
Standard		6 - 9	-	-	-	Max 2,000	-	Max 125	Max 35	Max 30	Max 400	Max 80	Max 2	Max 10	Max 50
Unit		-	mv	mg/L	µs/cm	ppm	FNU	ppm	°C	ppm	MNP/100ml	ppm	ppm	ppm	ppm
Jan	16-Jan-18	7.36	259.2	7.59	752	378	5.4	Not run	26.99						
Jan	17-Jan-18	7.01	311.5	7.01	803	402	119	8.8	27.74	2.01	<1.8	12.2	0.255	<3.1	12
Jan	18-Jan-18	7.04	415.9	6.67	870	435	6.4	8.7	27.83						
Jan	19-Jan-18	7.02	335.2	5.99	758	379	8.4	10	27.54						
Jan	20-Jan-18														
Jan	21-Jan-18	7.03	316.4	6.5	861	436	5		27.64						
Jan	22-Jan-18	7.13	436.5	6.71	624	312	2.1	6.4	27.42						
Jan	23-Jan-18	7.09	403	6.96	690	345	3.1	7.8	27.52						
Jan	24-Jan-18	6.98	336.7	7.76	717	359	25.1	6.8	27.67	3.36	<1.8	10	0.121	<3.1	4
Jan	25-Jan-18	7.02	337.7	6.08	770	385	3.6	5.6	27.81						
Jan	26-Jan-18	6.96	415.5	6.38	760	380	3	8.5	27.91						
Jan	27-Jan-18	6.68	478	5.55	1050	525	12.7		28.27						
Jan	28-Jan-18	6.88	346.6	7.14	1107	554	4.7		28.27						
Jan	29-Jan-18	6.67	386.2	7.04	1123	562	9.4	5.1	27.87						
Jan	30-Jan-18	6.79	339.7	6.57	990	415	8.7	8.9	27.46						
Jan	31-Jan-18	6.93	333	1.99	727	363	9.9	6.9	26.43	1.12	<1.8	11.8	0.144	<3.1	6

Month	Date	Cyanide	Chromium	Arsenic	Mercury	Cadmium	Selenium	Lead	Color	Odor	Zinc	Copper	Barium	Nickel	Sulphide	Free Chlorine	Formal-dehyde	Silver	Iron	Ammonia	Hexavalent Chromium(Cr6+)	Fluoride	Total Chlorine	Total Cyanide	Total Heavy Metals	Phenols
		Monthly Parameters																								
Standard		Max 0.2	Max 0.5	Max 0.25	Max 0.005	Max 0.03	Max 0.02	Max 0.2	-	-	Max 5	Max 1	Max 1	Max 0.2	Max 1	Max 1	Max 1	Max0.5	Max3.5	Max3.5	Max0.1	Max20	Max0.2			Max 1
Unit		ppm	ppm	ppm	ppm	ppm	ppm	ppm	-	-	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Oct	11-Oct-17	0.009	≤0.002	≤0.01	≤0.002	≤0.001	≤0.01	≤0.002	2.05	1	0.1	≤0.002	0.022	0.003	0.012	0.2	0.022									0.002
Nov	7-Nov-17	0.003	0.006	≤0.01	≤0.002	≤0.001	≤0.01	≤0.002	2.34	1.4	0.025	0.008	0.015	0.035	<0.005	0.2	0.025									<0.002
Dec	5-Dec-17	0.004	≤0.002	≤0.01	≤0.002	≤0.001	≤0.01	≤0.002	5.01	4	≤0.002	≤0.002	0.06	≤0.002	<0.005	0.1	0.008	≤0.002	0.43	4.06	<0.05	4.386	0.4			<0.002
Standard		Max 0.1	Max 0.5	Max 0.1	Max 0.005	Max 0.03	Max 0.02	Max 0.1	Max 150	Max 150	Max 2	Max 0.5	Max 1	Max 0.2	Max 1	Max 1	Max 1	Max0.5	Max3.5	Max10	Max0.1	Max20	Max0.2	Max1	Max10	Max 0.5
Unit		ppm	ppm	ppm	ppm	ppm	ppm	ppm	-	-	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Jan	17-Jan-18																						[illegible]			
Jan	24-Jan-18																						0.2			
Jan	31-Jan-18																						[illegible]			

Standard		6 ~ 8	-	-	-	Max 2,000		Max 125	Max 35	Max 30	Max 400	Max 80	Max 2	Max 10	Max 50	Max 0.1	Max 0.5	Max 0.1	Max 0.005	Max 0.03	Max 0.02	Max 0.1	Max 180	Max 160	Max 2	Max 0.5	Max 1	Max 0.2	Max 1	Max 1	Max 1	Max0.8	Max3.5	Max10	Max0.1	Max20	Max0.2	Max1	Max10	Max 0.8
Unit		-	mv	mg/L	µs/cm	ppm	FNU	ppm	°C	ppm	MNP/100ml	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	-	-	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Feb	1-Feb-18	7.02	352.4	6.24	716	358	8.3	14.5	27.57																															
Feb	2-Feb-18	6.91	328.7	5.65	720	394	5.2	6.8	27.82																															
Feb	3-Feb-18	7.01	435.3	6.84	843	422	8.1		27.28																															
Feb	4-Feb-18	6.81	345.4	7.56	843	421	2.3		27.61																															
Feb	5-Feb-18	7.24	348.7	7.6	832	416	3.1	7.1	27.67																															
Feb	6-Feb-18	6.7	334.8	7.78	870	435	8.1	6.6	27.56																															
Feb	7-Feb-18	6.92	346.2	6.77	841	421	4.7	7.4	27.79	1.53	<1.8	11.5	0.176	<3.1	8	0.003	≤0.002	≤0.01	≤0.002	≤0.001	≤0.01	≤0.002	0.61	2	0.004	≤0.002	0.014	0.006	<0.005	<0.1	0.037	≤0.002	0.094	0.021	<0.05	1.153	0.1			<0.002
Feb	8-Feb-18	6.94	335.8	6.93	815	408	35.5	5	27.7																															
Feb	9-Feb-18	6.81	354.1	7.42	770	385	8.2	5.3	27.99																															
Feb	10-Feb-18	7.04	366.4	8.01	778	411	9.2		28.06																															
Feb	11-Feb-18	7.13	304.4	6.55	852	427	7.4		27.93																															
Feb	12-Feb-18	6.79	349.7	6.42	858	429	11.1		28.07																															
Feb	13-Feb-18	6.71	354.8	7.4	891	445	14.2	7.4	28.14																												0.4			
Feb	14-Feb-18	6.5	398.8	7.9	915	458	14.2	8.4	28.34	1.75	<1.8	13.2	0.375	<3.1	8																									
Feb	15-Feb-18	6.59	417.7	7.01	843	421	10.2	6.4	28.36																															
Feb	16-Feb-18	7	372.9	6.15	808	403	61	12.3	28.36																															
Feb	17-Feb-18	6.9	362.1	5.83	834	417	52.1		28.26																															
Feb	18-Feb-18	7.12	379.4	6.18	824	429	45		28.24																															
Feb	19-Feb-18	6.7	348.8	7.6	841	405	11.2	5.2	28.76																															
Feb	20-Feb-18	6.7	387.3	6.95	752	376	19.3	9.9	27.72																												0.4			
Feb	21-Feb-18	6.84	444.9	7.18	799	399	18.6	9.3	28.09	2.42	<1.8	11.8	0.401	<3.1	10																									
Feb	22-Feb-18	6.82	398.4	7.42	822	401	19.5	8.9	28.16																															
Feb	23-Feb-18	7.1	354.5	8.01	793	408	11.2	13.9	28.36																															
Feb	24-Feb-18	7.1	370.5	8.17	817	382	33.6		28.68																															
Feb	25-Feb-18	6.92	318.7	6.96	852	428	5.14		28.79																															
Feb	26-Feb-18	6.88	352.6	7.14	848	414	11.5	8.2	28.69																															
Feb	27-Feb-18	6.5	398.8	7.4	776	408	11.1	16.1	28.07																												0.4			
Feb	28-Feb-18	6.89	352.7	6.26	825	413	56	11.2	29.01	2.02	<1.8	12.4	0.561	<3.1	4																									
Mar	1-Mar-18	6.9	414.8	8.84	1004	502	118		29.12																															
Mar	2-Mar-18	6.7	410.7	8.79	1002	511	120		29.1																															
Mar	3-Mar-18	6.9	413.7	8.74	1004	518	118		27.56																															
Mar	4-Mar-18	7.27	406.8	8.74	1027	514	58.4		28.65																															
Mar	5-Mar-18	7.06	406.6	8.52	936	468	14.1	8.1	28.67																															
Mar	6-Mar-18	7.12	406.3	6.82	1008	493	113	15	28.35																															0.014
Mar	7-Mar-18	7.23	412.5	6.62	1017	512	124	10.4	28.72	9.11	<1.8	10.4	0.216	<3.1	2	0.003	≤0.002	≤0.01	≤0.002	≤0.001	≤0.01	≤0.002	3.41	1.4	≤0.002	≤0.002	0.038	0.032	0.007	0.1	0.012	≤0.002	0.09	2.66	<0.05	4.85	0.3			
Mar	8-Mar-18	6.47	251.5	3.98	856	428	13.5	28.7	29.76																															
Mar	9-Mar-18	6.32	345.6	7.47	763	381	5.3	7	29.43																															
Mar	10-Mar-18	6.55	324.1	6.19	748	374	3.6		29.36																															
Mar	11-Mar-18	7.09	406.7	6.52	819	487	11.4		29.34																															
Mar	12-Mar-18	6.87	296.3	6.88	753	376	11.7	6.7	29.22																															
Mar	13-Mar-18	6.74	316.2	5.96	840	420	46.7	12	29.13																												0.3			
Mar	14-Mar-18	6.7	297.5	6.26	807	403	26.5	8.8	29.12	0.75	<1.8	11.9	0.473	<3.1	8																									
Mar	15-Mar-18	6.31	347.5	5.44	784	392	64.5	9.3	29.15																															
Mar	16-Mar-18	6.35	380	6.26	1119	560	12.2	13.5	27.74																															
Mar	17-Mar-18	6.36	373.3	6.03	865	428	120		29.29																															
Mar	18-Mar-18	6.36	379.2	6.25	788	402	12.2		29.22																															
Mar	19-Mar-18	6.76	381.4	6.13	819	420	11.6	5.8	29.28																															
Mar	20-Mar-18	6.11	387.4	5.77	854	427	10.1	19.6	29.41																												0.4			
Mar	21-Mar-18	6.1	399.3	6.04	820	410	37.3	34.1	29.62	0.75	<1.8	15	0.58	<3.1	10																									
Mar	22-Mar-18	6.29	375.2	5.94	832	422	26.4	7.9	29.33																															
Mar	23-Mar-18	6.36	373.9	6.14	851	427	11.5	8.8	29.28																															
Mar	24-Mar-18	6.21	401.2	5.72	760	380	14.8		29.49																															
Mar	25-Mar-18	6.06	407.2	5.72	782	391	6.1		29.39																															
Mar	26-Mar-18	6.28	396.2	6.81	690	377	9.9	7.9	29.97																															
Mar	27-Mar-18	5.9	417.5	4.92	843	421	6.3		29.48																												0.1			
Mar	28-Mar-18	6.6	387.6	6.06	848	424	8.4	6.8	29.43	0.75	<1.8	12.7	0.261	<3.1	2																									
Mar	29-Mar-18	6.81	314.8	6.04	685	418	4.9	4.1	29.13																															
Mar	30-Mar-18	6.96	289.5	4.46	753	382	16.7	22.6	29.43																															
Mar	31-Mar-18	7.34	288.7	260	1050	525	25.5		30.12																															

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED ★ MJTD

Monitoring Parameters Result for STP(Phase-2)

Inlet

Month	Date	pH	ORP	DO	EC	TDS	Turbidity	COD	Temp	BOD	T-Coli	T-N	T-P	O&G	SS	Cyanide	Chromium	Arsenic	Mercury	Cadmium	Selenium	Lead	Color	Odor	Zinc	Copper	Barium	Nickel	Sulphide	Free Chlorine	Formal-dehyde	Silver	Iron	Ammonia	Hexavalent Chromium (Cr6+)	Fluoride	Total Chlorine	Total Cyanide	Total Heavy Metals	Phenols
		Daily Parameters								Weekly Parameters						Monthly Parameters																										
Standard		6.5-8.5	-	-	-	Max 2,000	-	Max 300	Max 35 °C	Max 200	Max 400	Max 80	-	Max 5	Max 200	Max 0.2	Max 0.5	Max 0.25	Max 0.005	Max 0.03	Max 0.02	Max 0.2	150	150	Max 5	Max 1	Max 1	Max 0.2	Max 1	Max 1	Max 1	Max 0.5	Max3.5	Max10	Max0.1	Max20	Max0.2	Max	Max	Max 1
Unit		-				ppm			°C	ppm	MPN/100ml	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	Co-Pt	Co-Pt	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Oct	1-Oct-17																																							
Oct	2-Oct-17							268																																
Oct	3-Oct-17	6.25	254.2	4.45	570	284	33.8	132	29.95																															
Oct	4-Oct-17																																							
Oct	5-Oct-17																																							
Oct	6-Oct-17																																							
Oct	7-Oct-17																																							
Oct	8-Oct-17																																							
Oct	9-Oct-17	6.21	378.3	5.43	499	250	18.6	144	29.67																															
Oct	10-Oct-17	5.8	413.6	3.7	414	207	9.7	94	29.83	Temporarily stopped for tank cleaning																																
Oct	11-Oct-17	5.98	335.2	3.5	404	202	46.4		29.15																															
Oct	12-Oct-17	6.06	329.8	4.04	406	198	9.2		29.53																															
Oct	13-Oct-17	5.85	222	0.37	404	202	14.7	46	29.37																															
Oct	14-Oct-17																																							
Oct	15-Oct-17																																							
Oct	16-Oct-17	6.07	364.4	3.34	370	192	56.4	36	29.77																															
Oct	17-Oct-17	6.05	268.3	2.72	411	206	20	66	29.31	33.73	>160000	6	0.328	5.27	30	0.019	≤0.002	≤0.01	≤0.002	≤0.001	≤0.01	≤0.002	7.37	2	0.044	≤0.002	0.022	0.014	0.023	0.1	0.085									0.003
Oct	18-Oct-17																																							
Oct	19-Oct-17	6.43	198.7	5.46	432	218	22.8	70	29.43																															
Oct	20-Oct-17	6.46	341	5.76	632	413	66.6	28	29.61																															
Oct	21-Oct-17																																							
Oct	22-Oct-17																																							
Oct	23-Oct-17	6.53	285.8	5.13	535	267	64.1	100	29.63																															
Oct	24-Oct-17	6.83	401.1	4.05	609	304	26.4	26	29.79	6	>160000	9	0.643	4	22																									
Oct	25-Oct-17	6.71	423.2	4.2	539	262	32.1	65	29.82																															
Oct	26-Oct-17	6.35	276.8	4.46	523	310	12.9	37	29.62																															
Oct	27-Oct-17	6.42	360.5	4.85	596	193	25.2	211	29.97																															
Oct	28-Oct-17																																							
Oct	29-Oct-17																																							
Oct	30-Oct-17	6.05	313.4	5.06	467	234	25	291	30.02																															
Oct	31-Oct-17	5.26	422.9	5.51	702	351	26.2	114	29.94	10.8	130	13	0.412	9.09	70																									
Nov	1-Nov-17	6.74	292.2	4.85	688	344	11.2	64	29.95																															
Nov	2-Nov-17	4.52	485.1	3.29	894	447	10.4		29.39																															
Nov	3-Nov-17	6.34	342.2	4.01	481	231	10.7		29.26																															
Nov	4-Nov-17	6.21	448.2	2.87	669	336	6.4		28.94																															
Nov	5-Nov-17	6.21	427.9	4.01	937	469	7.7		29.46																															
Nov	6-Nov-17	6.84	346.3	6.05	2128	1072	56.8	43	29.75																															
Nov	7-Nov-17	5.82	436.2	4.9	514	257	10.3	49	29.45	28.9	>160	15.7	0.351	4.2	34	0.011	0.009	≤0.01	≤0.002	≤0.001	≤0.01	≤0.002	11.99	4	0.062	0.013	0.004	0.019	0.01	0.1	0.221									0.003
Nov	8-Nov-17	6.41	353.5	3.16	758	379	15.9	91	29.98																															
Nov	9-Nov-17	6.38	341	3.63	479	242	35.1	48	29.87																															
Nov	10-Nov-17	6.72	344	3.26	481	241	9.5	68	30.25																															
Nov	11-Nov-17	6.63	356.5	4.07	534	267	10		30.1																															
Nov	12-Nov-17	6.32	363.1	3.3	1014	507	33.6		29.78																															
Nov	13-Nov-17	6.48	361.4	5.14	668	335	10.5		29.57																															
Nov	14-Nov-17	6.61	392.2	3.93	1038	516	35.3	97	29.98																															
Nov	15-Nov-17	6.62	277.8	4.34	806	403	18.7	52	30.17	15.43	>160000	23.7	1.84	7.82	40																									
Nov	16-Nov-17	7.15	300.1	5.72	911	456	21.5	25	29.93																															
Nov	17-Nov-17	6.36	386.3	6.11	716	358	1.5	66	29.6																															
Nov	18-Nov-17	6.52	317.4	4.13	1124	562	27.1		30.26																															
Nov	19-Nov-17	6.34	382.6	3.77	934	467	5.1		30.19																															
Nov	20-Nov-17	6.47	353.1	3.85	894	447	6.2	80	29.99																															
Nov	21-Nov-17	6.1	379	5.79	883	441	9.5	81	30.12																															
Nov	22-Nov-17	6.68	301.6	3.39	864	432	16.2	53	29.78	9.6	220	9.1	<0.05	4	10																									
Nov	23-Nov-17	6.6	374.3	5.39	787	394	45.9	242	30.3																															
Nov	24-Nov-17	6.78	334.8	6.6	1023	512	4.1	31.3	29.3																															
Nov	25-Nov-17	6.72	337.2	6.9	850	530	4		29.97																															
Nov	26-Nov-17	6.94	294.5	3.32	1617	808	37.5		30.27																															
Nov	27-Nov-17	7.01	322.2	4.12	992	496	12.2	87	30.12																															
Nov	28-Nov-17	6.77	286.6	5.04	828	438	35.1	39	30.08																															
Nov	29-Nov-17	6.72	283.4	4.11	782	391	25.3	23	30.12	6.2	>160000	5	0.1	<3.1	18																									
Nov	30-Nov-17	6.52	273.1	3.83	900	450	6.1	33	29.42																															
Dec	1-Dec-17	6.19	303.2	3.62	771	385	9.3	99	29.48																															
Dec	2-Dec-17	8.7	370	3.29	942	471	7.2		29.23																															
Dec	3-Dec-17	6.84	355.5	4.5	1016	543	10.2		26.86																															
Dec	4-Dec-17	2.61	472.1	4.1	3420	1705	41.6	>1000	29.71																															
Dec	5-Dec-17	6.67	338.8	6.82	1153	578	6.7	139	26.86	18.8	>160000	14.1	1.38	17.01	96	0.003	≤0.002	≤0.01	≤0.002	≤0.001	≤0.01	≤0.002	17.47	4	0.026	≤0.002	0.026	0.01	0.071	<0.1	0.167	≤0.002	1.674	0.853	<0.05	3.555	<0.1			0.023
Dec	6-Dec-17	6.84	357.7	4.38	721	361	5.6	59	29.67																															
Dec	7-Dec-17	6.79	342.1	4.22	684	343	4.9	74	28.29																															
Dec	8-Dec-17	6.93	348.2	3.82	495	247	11	69	29.92																															
Dec	9-Dec-17	7.05	281.5	4.45	612	306	13.2		29.81																															
Dec	10-Dec-17	6.87	334.6	0.87	635	317	10.8		26.32																															
Dec	11-Dec-17	6.66	323.2	2.97	498	333	19.9	50	29.46																															
Dec	12-Dec-17	7.31	238.1	3.86	716	358	10.5	47	30.02																															
Dec	13-Dec-17	7.17	279.3	4.36	1068	533	7.4	51	30.02	10.16	>160000	6.8	0.396	7.64	52																									
Dec	14-Dec-17	7.29	325.4	5.18	1141	571	12.7	41	30.31																															
Dec	15-Dec-17	7.11	335.3	4.33	1336	665	8.9	62	29.99																															
Dec	16-Dec-17	7.24	314.8	5.12	1412	620	10.7		30.12																															
Dec	17-Dec-17	7.02	283.3	3.4	821	411	13.8		29.5																															
Dec	18-Dec-17	6.99	290.5	4.95	370	185	7.7		29.45																															
Dec	19-Dec-17	7.07	301.9	4.89	408	205	13.1	34	29.36																															
Dec	20-Dec-17	7.05	290.6	4.1	517	259	6.9	33	28.89	34.4	23	8.8	0.842	5.45	22																									
Dec	21-Dec-17	4.89	366.8	4.1	1016	508	5.8	62	28.74																															
Dec	22-Dec-17	7.21	311.5	5.16	653	326	10.7	42	29.01																															
Dec	23-Dec-17	6.97	335.8	1.54	703	353	12.5		27.9																															
Dec	24-Dec-17	7.25	348.5	3.45	362	390	13.6		30.11																															
Dec	25-Dec-17	6.98	330.1	1.22	604	302	10.5		27.34																															
Dec	26-Dec-17	6.93	381.1	1.03	615	307	20	Not run	27.34																															
Dec	27-Dec-17	6.97	387.9	1.3	599	299	8.5		27.7																															
Dec	28-Dec-17	7.14	126.8	2.36	608	304	7.1		27.94																															
Dec	29-Dec-17	6.86	236.6	5.56	475	238	14.6		29.07																															
Dec	30-Dec-17	7.08	294.5	5.1	578	289	16.2		29.24																															
Dec	31-Dec-17	7.06	305.3	5.26	676	339	25.2		29.28																															
Jan	1-Jan-18	7.22	282.5	4.29	784	392	23.8		29.24																															
Jan	2-Jan-18	6.8	364	4.46	820	410	9.2	48	29.15																															
Jan	3-Jan-18	6.95	305.9	4.9	698	350	8.8	36	29	7.99	>160000	13.2	0.424	4.91	50	0.007	≤0.002	≤0.01	≤0.002	≤0.001	≤0.01	≤0.002	18.97	1	0.03	0.008	0.036	0.006	<0.005	0.1	0.084	≤0.002	2.196	0.908	<0.05	1.544	0.1			0.019
Jan	4-Jan-18	6.88	307.5	5.12	1084	548	8.9		29.07																															
Jan	5-Jan-18	6.71	312.7	5.19	1022	448	9.1	Not run	29.06																															
Jan	6-Jan-18	6.84	337.9	2.09	778	389	10.2		28.03																															
Jan	7-Jan-18	7.2	431.7	4.01	678	442	11.3		27.24																															
Jan	8-Jan-18	7.07	386.3	1.64	623	311	6.2		28.15																															
Jan	9-Jan-18	7.17	353.1	2.25	634	316	6.8		28.33																															
Jan	10-Jan-18	7.17	274	3.86	955	476	19.3		29.8																															
Jan	11-Jan-18	Battery Shutdown																																						
Jan	12-Jan-18	6.83	290.7	7.36	727	342	30.7		29.06																															
Jan	13-Jan-18	6.38	366.8	4.84	1247	620	21.3																															
Jan	14-Jan-18	4.8	371.2	4.83	1173	587	6.7		28.89																															
Jan	15-Jan-18	6.78	313.3	4.77	624	312	16.2	30	29.31																															
Standard		6 – 9	-	-	-	Max 2,000	-	Max 400	Max 35 °C	Max 200	-	Max 80	Max6	Max 40	Max 200	Max 0.1	Max 0.5	Max 0.1	Max 0.005	Max 0.01	Max 0.02	Max 0.1	150	150	Max 2	Max 0.5	Max 1	Max 0.2	Max 1	Max 1	Max 1	Max0.5	Max3.5	Max80	Max0.1	Max20	Max0.2	Max1	Max10	Max 0.5
Unit		-	mv	mg/L	µs/cm	ppm	FNU	ppm	°C	ppm	MPN/100ml	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	Co-Pt	Co-Pt	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Jan	16-Jan-18	6.89	218.7	5.19	2022	1012	12.9	33	29.05																															
Jan	17-Jan-18	7.1	234.7	2.12	1150	5755	12		28.29																															
Jan	18-Jan-18	6.95	361.1	1.18	849	425	8.9		28.03																															
Jan	19-Jan-18	6.93	318.4	3.78	665	332	9.5		29.04																															
Jan	20-Jan-18																																							
Jan	21-Jan-18	6.96	32.6	4.66	890	482	9.8		29.06																															
Jan	22-Jan-18	7	373.9	0.82	739	370	15.7		27.22																															

Standard		6 – 9	-	-	-	Max 2,000		Max 400	Max 35 °C	Max 200	-	Max 80	Max8	Max 40	Max 200	Max 0.1	Max 0.5	Max 0.1	Max 0.005	Max 0.03	Max 0.02	Max 0.1	150	150	Max 2	Max 0.5	Max 1	Max 6.2	Max 1	Max 1	Max 1	Max0.5	Max3.5	Max90	Max0.1	Max20	Max0.2	Max1	Max10	Max 0.5
Unit		-	mv	mg/L	µs/cm	ppm	FNU	ppm	°C	ppm	MPN/100ml	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	Co-Pt	Co-Pt	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Jan	23-Jan-18	7.08	376.1	1.04	646	323	12		27.16																														
Jan	24-Jan-18	7.02	278.2	0.71	671	336	12.6		27.3																														
Jan	25-Jan-18	7.06	379.1	3.06	636	339	12.09		27.25																														
Jan	26-Jan-18	7.07	380.4	1.3	733	364	9.5		27.5																														
Jan	27-Jan-18	6.7	420.4	2.14	836	418	7.1		27.36																														
Jan	28-Jan-18	6.76	419.1	1.62	1018	509	8.3		27.32																														
Jan	29-Jan-18	6.79	432.6	1.26	968	398	8.6		27.42																														
Jan	30-Jan-18	6.84	432.1	1.81	784	392	8.7		26.8																														
Jan	31-Jan-18	6.93	333	1.99	727	363	9.9		26.43																														
Feb	1-Feb-18	Temporary stoped for tank cleaning in February and March 2018																																					
Feb	2-Feb-18																																						
Feb	3-Feb-18	6.95	424.8	2.14	757	379	12.8		27.66																														
Feb	4-Feb-18	6.89	330.9	1.76	649	324	10.2		27.39																														
Feb	5-Feb-18	7.05	344.8	0.97	782	391	10.6		27.13																														
Feb	6-Feb-18	6.82	262.2	4.9	841	421	18.2		26.67																														
Feb	7-Feb-18	6.88	427	1.54	813	407	12.6		27.98																														
Feb	8-Feb-18	6.99	351.2	2.83	729	364	13		27.31																														
Feb	9-Feb-18	6.97	341.4	2.5	688	344	10.9		27.49																														
Feb	10-Feb-18	7.28	355.9	3.22	742	405	12.2		28.06																														
Feb	11-Feb-18	6.85	352	2.85	732	369	12.6		28.32																														
Feb	12-Feb-18	6.98	328.9	1.27	859	430	9.7		27.34																														
Feb	13-Feb-18	6.89	340.5	1.25	819	410	12.9		27.33																														
Feb	14-Feb-18	6.96	382.2	1.52	792	395	10.4		27.55																														
Feb	15-Feb-18	7.04	375.4	1.13	752	376	7.5		27.58																														
Feb	16-Feb-18	7.08	361.7	2.48	800	400	7.7		27.6																														
Feb	17-Feb-18	7.1	348.6	1.58	738	369	3.6		27.5																														
Feb	18-Feb-18	7.05	358.7	1.66	748	385	6.7		27.22																														
Feb	19-Feb-18	7.32	344.9	2.5	729	407	13		27.31																														
Feb	20-Feb-18	7.01	382.2	2.31	767	384	6.6		26.88																														
Feb	21-Feb-18	6.77	356.8	2.27	619	310	4.5		27.16																														
Feb	22-Feb-18	7.04	349.6	1.75	672	420	9.5		26.68																														
Feb	23-Feb-18	7.28	352.9	1.54	739	406	12.3		27.34																														
Feb	24-Feb-18	7.08	385.9	6.74	1055	527	2		26.57																														
Feb	25-Feb-18	7.02	365.1	2.84	580	288	14.6		28.87																														
Feb	26-Feb-18	7.22	352.5	2.68	749	328	10.2		28.68																														
Feb	27-Feb-18	6.98	364	2.65	736	369	12.2		28.34																														
Feb	28-Feb-18	7.01	333	1.82	1395	698	26.3		28.59																														
Mar	1-Mar-18	6.93	400.2	2.3	1080	546	24.2		28.43																														
Mar	2-Mar-18	7.11	410.8	2.3	1079	549	25.3		29.21																														
Mar	3-Mar-18	7.23	409.7	2.3	1052	549	24.2		27.56																														
Mar	4-Mar-18	7.07	230.2	1.76	888	471	20.3		27.29																														
Mar	5-Mar-18	6.73	408.8	2.37	1199	599	19.1		27.83																														
Mar	6-Mar-18	7.12	405.6	2.38	1025	563	19.8		27.36																														
Mar	7-Mar-18	7.01	410.5	2.31	1009	539	16.7		27.48																														
Mar	8-Mar-18	6.47	251.5	3.98	856	428	13.5		29.76																														
Mar	9-Mar-18	6.75	304.1	1.67	645	322	10.5		28.66																														
Mar	10-Mar-18	6.73	266.6	2.39	806	396	13.6		27.86																														
Mar	11-Mar-18	7.33	263.9	1.78	1008	541	20.1		27.59																														
Mar	12-Mar-18	7.11	275.8	1.9	782	391	6.6		28.36																														
Mar	13-Mar-18	6.92	315.5	1.99	771	385	8.8		28.29																														
Mar	14-Mar-18	7.07	194	1.69	722	361	12		28.61																														
Mar	15-Mar-18	6.99	254.8	1.42	693	346	8.4		28.52																														
Mar	16-Mar-18	6.74	349.7	1.91	779	390	7.7		28.72																														
Mar	17-Mar-18	6.81	327.7	1.67	823	412	10.2		28.59																														
Mar	18-Mar-18	6.9	254.8	1.36	696	356	8.5		28.48																														
Mar	19-Mar-18	7.06	275	1.71	723	388	10,5		28.36																														
Mar	20-Mar-18	6.68	346.8	2.2	698	349	7.3		28.47																														
Mar	21-Mar-18	6.71	354.8	2.59	676	338	5.6		28.77																														
Mar	22-Mar-18	7.07	347.7	2.16	688	375	6.9		28.56																														
Mar	23-Mar-18	6.79	351	2.1	623	352	7.2		28.91																														
Mar	24-Mar-18	6.43	354.7	3.28	736	368	10.8		29.81																														
Mar	25-Mar-18	6.49	375.6	3.8	717	359	5.6		29.03																														
Mar	26-Mar-18	6.52	369.5	2.38	724	362	8.5		29.68																														
Mar	27-Mar-18	6.47	335.8	3.54	984	493	7.1		29.67																														
Mar	28-Mar-18	6.81	319.6	2.51	800	400	7.8		28.46																														
Mar	29-Mar-18	6.68	344.7	3.56	796	428	7.2		28.5																														
Mar	30-Mar-18	6.74	352.4	3.22	764	398	7.4		29.42																														
Mar	31-Mar-18	7.28	333.9	1.2	712	356	10.8		29.04																														

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED
MJTD

Monitoring Parameters Result for STP(Phase-2)

Month	Date	Outlet																																								
		pH	ORP	DO	EC	TDS	Turbidity	COD	Temp	BOD	T-Coli	T-N	T-P	O&G	SS	Cyanide	Chromium	Arsenic	Mercury	Cadmium	Selenium	Lead	Color	Odor	Zinc	Copper	Barium	Nickel	Sulphide	Free Chlorine	Formal-dehyde	Silver	Iron	Ammonia	Hexavalent Chromium (Cr6+)	Fluoride	Total Chlorine	Total Cyanide	Total Heavy Metals	Phenols
		Daily Parameters								Weekly Parameters						Monthly Parameters																										
Standard		5.0 - 9.0	-	-	-	Max 2,000	-	Max 70	Max 40	Max 20	Max 400	Max 80	Max 2	Max 5	Max 30	Max 0.2	Max 0.5	Max 0.25	Max 0.005	Max 0.03	Max 0.02	Max 0.2	-	-	Max 3	Max 1	Max 1	Max 0.2	Max 1	Max 1	Max 1	Max	Max3.5	Max10	Max0.1	Max20	Max0.2			Max 1
Unit		-	-	-	-	ppm	-	ppm	°C	ppm	MNP/100ml	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	-	-	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Oct	1-Oct-17																																								
Oct	2-Oct-17	6.17	405.1	5.22	464	232	3	3.4	30.03																																
Oct	3-Oct-17	6.81	408.8	5	487	244	1.5	2.7	30.08																																
Oct	4-Oct-17																																								
Oct	5-Oct-17																																								
Oct	6-Oct-17																																								
Oct	7-Oct-17																																								
Oct	8-Oct-17																																								
Oct	9-Oct-17	5.45	537.4	5..58	459	230	2.2	3.3	29.18																																
Oct	10-Oct-17	5.89	410.8	5.14	455	228	2.8	5	29.77																																
Oct	11-Oct-17	6.04	382.1	4.74	445	223	2.9		29.25																																
Oct	12-Oct-17	6.11	362.9	5.22	439	241	3.1		29.44																																
Oct	13-Oct-17	6.55	360.5	4.33	443	222	2.7	5.4	29.31																																
Oct	14-Oct-17																																								
Oct	15-Oct-17																																								
Oct	16-Oct-17	6.37	334.6	5.35	423	264	2.2	5.1	29.38																																
Oct	17-Oct-17	6.17	339.5	4.76	476	239	1.9	6	29.41	1.13	<1.8	4	0.076	<3.1	2	0.006	≤0.002	≤0.01	≤0.002	≤0.001	≤0.01	≤0.002	2.42	1	0.04	≤0.002	0.018	≤0.002	0.009	<0.1	0.012									0.006
Oct	18-Oct-17																																								
Oct	19-Oct-17	6.65	434.7	6.02	441	220	2	6.8	29.01																																
Oct	20-Oct-17	6.77	392.4	6.62	412	206	1.7	<0.7	28.53																																
Oct	21-Oct-17																																								
Oct	22-Oct-17																																								
Oct	23-Oct-17	6.69	42.58	5.62	505	253	2	6.3	29.39																																
Oct	24-Oct-17	6.92	413.1	6.48	480	241	1.7	3.2	29.46	2.63	<1.8	7	0.062	<3.1	2																										
Oct	25-Oct-17	6.31	456.4	5.22	493	225	2.2	4.5	29.27																																
Oct	26-Oct-17	6.19	403.5	5.66	531	219	2.6	5.3	29.42																																
Oct	27-Oct-17	6.56	413.7	5.34	522	250	2.7	5.3	29.37																																
Oct	28-Oct-17																																								
Oct	29-Oct-17																																								
Oct	30-Oct-17	6.73	353.4	6.95	639	320	7.1	11.6	29.95																																
Oct	31-Oct-17	6.67	356.9	5.35	621	310	2	6.9	29.51	1.52	<1.8	12	0.091	<3.1	8																										
Nov	1-Nov-17	6.63	376.6	6.55	600	300	1.7	10.9	29.4																																
Nov	2-Nov-17	5.97	458.2	5.78	617	308	1.8		29.82																																
Nov	3-Nov-17	6.03	439	5.87	625	313	3.8		29.15																																
Nov	4-Nov-17	6.14	468.3	5.13	645	323	1.7		29																																
Nov	5-Nov-17	6.02	447.8	6.09	656	329	1.8		29.16																																
Nov	6-Nov-17	6.82	354.1	4.97	691	340	1.7	8.3	28.92																																
Nov	7-Nov-17	6.32	445.8	5.21	759	380	1.5	3	28.47	2.77	<1.8	5.9	0.106	<3.1	8	0.007	0.007	≤0.01	≤0.002	≤0.001	≤0.01	≤0.002	3.24	1	0.022	0.009	≤0.001	0.008	<0.005	0.1	0.033									0.002
Nov	8-Nov-17	6.53	375.9	5.07	796	399	1.8	3.8	28.79																																
Nov	9-Nov-17	6.81	342.8	6.97	739	370	1.5	5.3	29.1																																
Nov	10-Nov-17	6.62	377.2	5.35	626	313	2.1	4.5	29.48			s																													
Nov	11-Nov-17	6.64	355.5	6.06	609	305	2		29.89																																
Nov	12-Nov-17	6.85	346.3	6.11	584	292	2.2		29.4																																
Nov	13-Nov-17	6.48	362.4	6.65	570	285	1.7		29.06																																
Nov	14-Nov-17	6.53	397.6	6.12	613	306	1.7	4.2	28.97																																
Nov	15-Nov-17	6.53	419.2	5.9	660	330	1.9	3	29.33	12.26	<1.8	6.9	0.077	<3.1	8																										
Nov	16-Nov-17	7.3	317.2	6.43	674	337	4.1	3.5	29.11																																
Nov	17-Nov-17	6.36	386.3	6.11	716	358	1.5	5	29.6																																
Nov	18-Nov-17	6.38	263.6	5.46	993	497	2.2		29.73																																
Nov	19-Nov-17	6.29	387.5	6	910	455	2.5		29.81																																
Nov	20-Nov-17	6.47	351.2	5.67	857	429	2.1	8.3	29.97																																
Nov	21-Nov-17	6.31	410.3	6.01	986	493	4.9	13.1	29.6																																
Nov	22-Nov-17	6.77	378.4	4.85	774	337	2.7	13.7	29.82	1.8	<1.8	9.2	0.072	<3.1	2																										
Nov	23-Nov-17	6.57	386.1	6.57	1067	534	2.1	8.6	29.49																																
Nov	24-Nov-17	6.74	328.8	6.22	933	467	4.2	12.8	28.9																																
Nov	25-Nov-17	6.58	352.3	5.68	859	470	4.6		30.3																																
Nov	26-Nov-17	7	287.7	4.82	830	415	2.2		29.91																																
Nov	27-Nov-17	7	324.1	5.92	1071	536	3.1	26.5	30.01																																
Nov	28-Nov-17	6.83	304.2	6.59	828	492	4.2	20.1	29.94																																
Nov	29-Nov-17	7.01	300.7	6.14	897	478	3.5	14.1	30.19	3.25	<1.8	7.9	0.126	<3.1	2																										
Nov	30-Nov-17	6.44	295.2	5.05	888	444	2.7	8.5	29.61																																
Dec	1-Dec-17	6.38	295.9	5.68	893	447	2.4	9.1	28.88																																
Dec	2-Dec-17	6.63	403.5	5.32	822	441	2.3		28.76																																
Dec	3-Dec-17	6.83	354.4	5.78	908	454	2.1		28.48																																
Dec	4-Dec-17	4.63	415	6.28	936	468	2.5	0.8	27.94																																
Dec	5-Dec-17	6.51	386.3	6.17	954	477	2.5	5.5	27.53	1.74	<1.8	10.8	<0.05	<3.1	2	0.002	≤0.002	≤0.01	≤0.002	≤0.001	≤0.01	≤0.002	9.76	1.4	≤0.002	≤0.002	0.008	0.006	<0.005	0.1	<0.003	≤0.002	0.1	0.117	<0.05	2.634	0.1			0.012
Dec	6-Dec-17	6.81	387.1	5.65	1025	512	2.4	7	28.15																																
Dec	7-Dec-17	6.74	376.4	5.42	1019	432	2.3	6.2	28.29																																
Dec	8-Dec-17	6.9	350.5	5.82	896	448	2.3	6	29																																
Dec	9-Dec-17	6.97	342.9	6.35	865	433	3.3		29.31																																
Dec	10-Dec-17	7.1	318.2	4.89	868	439	2.8		29.21																																
Dec	11-Dec-17	6.86	288.7	5.24	789	398	2.6	6.6	28.27																																
Dec	12-Dec-17	7.35	237.7	5.82	828	414	2.6	5.8	29.2																																
Dec	13-Dec-17	7.26	287.1	6.07	869	435	2.5	7.9	29.07	0	<1.8	7.9	<0.05	<3.1	4																										
Dec	14-Dec-17	7.34	345.7	6.03	874	437	2.9	9.3	29.42																																
Dec	15-Dec-17	7.17	339.1	5.11	831	415	3.2	11.6	29.28																																
Dec	16-Dec-17	7.23	352.2	6.04	856	428	3.1		29.32																																
Dec	17-Dec-17	7.07	283.3	5.74	1000	501	5.8		28.71																																
Dec	18-Dec-17	7.06	292.3	6.42	938	469	3.9		28.43																																
Dec	19-Dec-17	7.12	305.2	5.38	783	392	2.3	4.7	27.92																																
Dec	20-Dec-17	7.01	303.1	5.25	638	319	2.6	6.7	27.48	0	<1.8	11	0.156	<3.1	4																										
Dec	21-Dec-17	5.39	367.8	4.61	657	329	2.6	7.1	26.45																																
Dec	22-Dec-17	7.22	327.7	5.37	712	356	2.8	7.3	26.3																																
Dec	23-Dec-17	6.99	365.7	6.91	747	373	1.3		26.52																																
Dec	24-Dec-17	7.22	386.7	5.65	752	382	2.6		26.63																																
Dec	25-Dec-17	6.94	403.7	5.85	751	376	1.5		25.93																																
Dec	26-Dec-17	6.89	406.6	5.79	753	376	1.9	Not run	26.15																																
Dec	27-Dec-17	6.93	415.2	7.98	856	378	2.2		26.3																																
Dec	28-Dec-17	7.21	192.5	8.67	767	384	2.5		26.24																																
Dec	29-Dec-17	7.11	343.7	6.83	780	390	2.6		26.1																																
Dec	30-Dec-17	6.99	326.6	5.9	741	371	2.2		27.09																																
Dec	31-Dec-17	7.07	386.1	5.77	670	335	2.1		26.3																																
Jan	1-Jan-18																																								
Jan	2-Jan-18	7.2	465.9	6.81	649	324	2.5	5.6	27.92																																
Jan	3-Jan-18	7.24	302.1	5.51	79.8	399	2.2	8.4	27.79	4.05	<1.8	8	0.366	<3.1	2	<0.002	≤0.002	≤0.01	≤0.002	≤0.001	≤0.01	≤0.002	6.22	1.4	≤0.002	≤0.002	0.012	0.01	<0.005	0.1	0.006	≤0.002	0.214	0.264	<0.05	2.505	[illegible]			<0.002
Jan	4-Jan-18	7.13	310.3	6.04	825	412	2.6		28.07																																
Jan	5-Jan-18	7.22	322.2	5.59	774	385	2.4		28.12																																
Jan	6-Jan-18	6.97	352.9	5.94	837	419	1.8		27.22																																
Jan	7-Jan-18	7.71	355.4	5.3	838	389	2.7		25.29																																
Jan	8-Jan-18	7.07	400.1	6.2	842	421	2		27.69																																
Jan	9-Jan-18	7.23	326.9	7.06	842	421	3.1		28.9																																
Jan	10-Jan-18	7.07	329.3	6.54	844	422	2.5		27.8																																
Jan	11-Jan-18	Battery Shutdown																																						
Jan	12-Jan-18	7.03	329.3	6.54	844	422	2.5		27.8																																
Jan	13-Jan-18	5.95	349.7	5.5	866	433	10.8		27.64																																
Jan	14-Jan-18	6.06	350.8	6.1	863	432	3.2		27.8																																
Jan	15-Jan-18	7.02	330.3	5.78	876	435	2.7		27.64																																
Standard		6 - 9	-	-	-	Max 2,000	-	Max 125	Max 36	Max 30	Max 400	Max 80	Max 2	Max 10	Max 50	Max 0.1	Max 0.5	Max 0.1	Max 0.005	Max 0.03	Max 0.02	Max 0.1	Max 150	Max 150	Max 2	Max 0.5	Max 1	Max 0.2	Max 1	Max 1	Max 1	Max0.5	Max3.5	Max10	Max0.1	Max20	Max0.2			Max 0.5
Unit		-	mV	mg/L	µs/cm	ppm	FNU	ppm	°C	ppm	MNP/100ml	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	-	-	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Jan	16-Jan-18	7.12	267.6	7.55	852	431	14.3	6	27.91																																
Jan	17-Jan-18	7.07	240.7	6.14	845	422	2.2		27.85																																
Jan	18-Jan-18	7.02	402.7	5.88	841	420	2.3		27.04																																
Jan	19-Jan-18	7.06	330.4	6.02	843	422	2.3																																
Jan	20-Jan-18																																							
Jan	21-Jan-18	7.05	406.3	6.1	846	432	2.2		27.5																																
Jan	22-Jan-18	7.02	413.9	6.36	852	426	2		28.22																																

Standard		6 ~ 9	-	-	-	Max 2,000	-	Max 125	Max 35	Max 30	Max 400	Max 80	Max 2	Max 10	Max 50	Max 0.1	Max 0.5	Max 0.1	Max 0.005	Max 0.43	Max 0.02	Max 0.1	Max 150	Max 150	Max 2	Max 0.5	Max 1	Max 0.2	Max 1	Max 1	Max 1	Max 0.5	Max3.5	Max10	Max0.1	Max20	Max0.2			Max 0.5
Unit		-	mv	mg/L	µs/cm	ppm	FNU	ppm	°C	ppm	MNP/100ml	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	-	-	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Jan	23-Jan-18	7.12	405.5	6.75	846	423	2.5		26.71																															
Jan	24-Jan-18	7.01	345.4	7.61	853	426	2.4		25.72																															
Jan	25-Jan-18	7.02	405.2	6.66	836	436	2.3		25.62																															
Jan	26-Jan-18	6.99	397.7	7.31	857	428	2.7		25.65																															
Jan	27-Jan-18	6.9	526.6	6.87	887	443	11.8		25.71																															
Jan	28-Jan-18	6.74	498.8	7.46	902	452	7.3		25.83																															
Jan	29-Jan-18	6.86	568.7	7.41	862	432	12.8		25.64																															
Jan	30-Jan-18	6.76	520.3	6.12	926	463	3.6		25.42																															
Jan	31-Jan-18	6.97	296.6	4.68	599	299	9.9		28.52																															
Feb	1-Feb-18																																							
Feb	2-Feb-18																																							
Feb	3-Feb-18	6.92	457.6	5.56	947	479	2.1		24.73																															
Feb	4-Feb-18	6.77	351.2	6.49	945	472	2		25.12																															
Feb	5-Feb-18	7	371.4	7.19	951	476	2.7		25.52																															
Feb	6-Feb-18	6.82	421.5	6.32	948	478	2.1		25.66																															
Feb	7-Feb-18	6.77	510.6	7.42	965	482	7.9		25.32																															
Feb	8-Feb-18	6.91	359.9	7.44	958	479	5.1		25.46																															
Feb	9-Feb-18	6.82	356.8	7.81	969	485	3.6		25.68																															
Feb	10-Feb-18	7.22	355.9	8.24	992	512	4		26.12																															
Feb	11-Feb-18	7.32	358.8	7.5	986	562	4.2		26.18																															
Feb	12-Feb-18	6.87	346.2	6.47	975	488	2.4		26.21																															
Feb	13-Feb-18	6.73	351.8	6.28	977	488	2.2		26.44																															
Feb	14-Feb-18	6.7	415.1	7.68	980	490	2.1		26.81																															
Feb	15-Feb-18	6.83	411.4	7.61	981	491	1.8		26.68																															
Feb	16-Feb-18	6.87	378.2	8.63	959	479	2.3		26.53																															
Feb	17-Feb-18	6.83	367.1	6.27	965	483	2.2		26.58																															
Feb	18-Feb-18	6.75	368.2	6.22	952	492	2.3		26.45																															
Feb	19-Feb-18	6.75	371.6	8.34	945	478	2		26.66																															
Feb	20-Feb-18	6.78	392.5	7.76	959	429	2.3		26.24																															
Feb	21-Feb-18	6.62	431.5	6.87	992	987	2		26.26																															
Feb	22-Feb-18	6.69	412.8	7.44	967	883	2		26.25																															
Feb	23-Feb-18	6.91	359.8	7.68	958	562	2.1		26.93																															
Feb	24-Feb-18	7.14	337	3.71	1189	595	17.9		29.63																															
Feb	25-Feb-18	6.86	386	7.52	1077	538	3.6		27.01																															
Feb	26-Feb-18	7.22	362.3	6.45	1288	521	2.3		27.06																															
Feb	27-Feb-18	7	355.8	6.28	965	479	2.1		27.12																															
Feb	28-Feb-18	6.89	350.5	6.31	1063	532	10.4		27.4																															
Mar	1-Mar-18	6.87	408.6	90.6	1076	538	7.07		27.6																															
Mar	2-Mar-18	6.9	407.8	90.8	1058	547	7.09		29.1																															
Mar	3-Mar-18	6.86	409.4	90.8	1082	539	7.23		27.56																															
Mar	4-Mar-18	6.97	414.3	6.43	1091	546	4.7		27.59																															
Mar	5-Mar-18	6.87	407.1	6.3	1094	547	4.5		27.72																															
Mar	6-Mar-18	6.89	407.3	6.41	1092	544	4.8		27.36																															
Mar	7-Mar-18	6.79	408.2	6.45	1005	603	5.1		27.58																															
Mar	8-Mar-18	5.74	371.2	6.32	1080	540	4.3		28																															
Mar	9-Mar-18	6.44	343.7	6.89	1091	545	4.1		28.29																															
Mar	10-Mar-18	6.76	371.3	6.42	1086	547	5.1		28.39																															
Mar	11-Mar-18	6.89	362.1	6.3	1095	548	4.8		28.73																															
Mar	12-Mar-18	6.94	299.6	8.24	1156	578	4.9		28.3																															
Mar	13-Mar-18	6.69	333.9	7.05	1086	543	3.5		28.1																															
Mar	14-Mar-18	6.7	367.3	6.86	1089	545	4.6		28.36																															
Mar	15-Mar-18	6.57	340.3	6.04	1088	544	2.1		28.24																															
Mar	16-Mar-18	6.35	380	6.26	1119	560	12.2		27.74																															
Mar	17-Mar-18	6.34	376.3	6.74	1124	562	8.1		27.71																															
Mar	18-Mar-18	6.36	368.9	6.86	446	546	8.3		27.72																															
Mar	19-Mar-18	6.53	378	6.19	1135	561	4.8		27.79																															
Mar	20-Mar-18	6.15	386.8	5.95	1126	563	3.9		28.26																															
Mar	21-Mar-18	6.17	398.7	6.58	1147	574	2.9		28.55																															
Mar	22-Mar-18	6.3	374.4	6.23	1131	581	4.3		28.2																															
Mar	23-Mar-18	6.52	378.3	6.71	1126	560	5.1		28.29																															
Mar	24-Mar-18	6.27	401.2	5.2	1136	569	7.5		28.38																															
Mar	25-Mar-18	6.11	405.1	5.65	1160	580	12		28.37																															
Mar	26-Mar-18	6.21	414.6	6.22	1147	546	4.7		28.44																															
Mar	27-Mar-18	6.25	399.6	4.32	1168	584	7.4		28.44																															
Mar	28-Mar-18	6.51	388.8	6.25	1170	585	6.3		28.64																															
Mar	29-Mar-18	6.73	364.7	5.88	915	416	11		28.59																															
Mar	30-Mar-18	6.29	376.2	6.41	1154	566	7.4		28.41																															
Mar	31-Mar-18	6.97	410.1	4.7	1146	573	5.4		28.76																															

MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED ★ MJTD

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