

Environmental Monitoring Report Phase - 1 (Operation Phase)



CONTENTS

1. Executive Summary
2. Summary of Monitoring Activities
3. Monitoring Results
4. Environmental Monitoring Form

Appendix

- A. Water and Waste Water Monitoring Report for June 2016
- B. Ground subsidence and ground water usage monitoring status
(Construction Monthly Progress Report) April 2016 to September 2016
- C. Waste Disposal Record
(Construction Monthly Progress Report) April 2016 to September 2016
- D. General Waste Disposal Record
(Admin Complex Compound) March 2016 to September 2016
- E. Sewage Treatment Plant Monitoring Record
April 2016 to September 2016
- F. Accident or Incident Case Record
March 2016 to September 2016



1. Executive Summary

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

The monitoring record from April 2016 to September 2016 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;

EMP for Phase 1, Operation Phase Report first report was submitted at April 2016 and second report is submitted this day attached with Operation Phase implementation schedule. Subsequent Operation Phase reports for the Phase 1 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;

None

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

We would like to inform that Suspended Solid at Thilawa SEZ retention pond discharge point (SW-1) and Retention Canal Discharge point (SW-5) is higher than the standard. We are discussing with our environmental consultant to change the monitoring points for SW_1 and SW-5 because that location is the mixing point of the water from the Thilawa SEZ treated water and rainwater. Rainwater includes high Suspended Solid as it is the natural surface water conditions around this area, similar to the outside of Thilawa SEZ such as SW-2, SW-3 and SW-4. After we confirmed the changed locations, we will apply to the relevant government authority to obtain approval for such change of monitoring points.

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

There was four case of minor accidents happened during this monitoring period at Thilawa SEZ common area and please refer to the attached Appendix (Accident Case). Each tenant will report accidents record directly to Environmental Section, One Stop Service Center, Thilawa SEZ Management Committee.



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 this project area (1point)	1 week each in dry and wet season (First 3 years after operation stage)	Refer to Environmental Monitoring Report (Operation Phase) No.1, air quality monitoring will start after consult with environmental expert.
Water Quality	Water temperature, pH, SS, DO, BOD, COD, coliform count, 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, Nickel	Representative points in this project area (3 points)	Bi-monthly for water temperature, pH, SS, DO, BOD, COD, T-coli, T-N, T-P, color and odor, Bi-annually for all parameters	Water and Waste water quality monitoring report June, 2016 (Bi-Monthly)
Waste	Status of non-hazardous waste management Status of hazardous waste management	Each Locator*	Twice/year	Monthly Progress Reports (April, May, June, July, August, September) 2016
Noise and Vibration	Noise level at the monastery and residences to check effect of buffer zone for sound-proofing to	Representative points in this project area (3 points)	One time each in dry and wet season (First 3 years after operation stage)	Refer to Environmental Monitoring Report (Operation Phase) No.1, Noise and vibration monitoring will start after consult with environmental expert.
Ground Subsidence	Ground elevation Consumption of ground water amount	Representative (1 point)	Every week	Monthly Progress Reports (April, May, June, July, August, September) 2016
Hydrology				
Risk for infectious disease such as AIDS/HIV	Status of measures of infectious disease	Each Locator*	Once/month	Monthly Progress Reports (April, May, June, July, August, September) 2016
Working conditions (including occupational safety)	Prehension of condition of occupational safety and health Prehension of infectious disease	Each Locator*	Once/ month	
Accident	Existence of accident	Each Locator*	As occasion arise	

*Remark: Each locator will report directly to Environment Section, One Stop Service Center, Thilawa SEZ Management Committee





MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED

**Thilawa Special Economic Zone (Zone A)
Development Project –Phase 1**

Environment Monitoring Form

Environmental Monitoring Plan (Operation Phase)



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.)

Attached approval letter:

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 -

Remarks: Air quality monitoring will start after two years (December 2017) according to the consultation with environmental expert which was reported in operation phase first monitoring report.

NO₂, SO₂, 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)
Construction Area Near Gate 2	NO ₂	ppm						Once in three months	HAZSCANNER, EPAS	
	SO ₂	ppm							HAZSCANNER, EPAS	
	CO	ppm							HAZSCANNER, EPAS	
	TSP	ppm							HAZSCANNER, EPAS	
	PM10	ppm							HAZSCANNER, EPAS	

***Remark: Referred to the Japan and Thailand Standard (EIA Report, Table 6.4-1)**

Complains from Residents

- Are there any complains 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 Complains from Residents	Countermeasures

2)(a) Water Quality - April 2016
Measurement 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 Referred 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			Max 40			HI7609829-1 Sensor	
	pH	-			5.0-9.0			HI7609829-1 Sensor	
	SS	mg/l			Max 30			APHA-AWWA-WEF Method	
	DO	mg/l			-	>=4		HI7609829-2 Sensor	
	BOD	mg/l			Max 20			APHA-AWWA-WEF Method	
	COD(Cr)	mg/l			Max 70*			Dichromate Method	
	Total Coliform	MPN/100ml			Max 400	7.5×10 ³		APHA-AWWA-WEF Method	
	T-N	mg/l	N/A	N/A	Max 80		Twice in one year	APHA-AWWA-WEF Method	
	T-P	mg/l			-			Photometric Method	
	Color	Co.Pt			Max 150			APHA-AWWA-WEF Method	
	Odor	-			-			APHA-AWWA-WEF Method	
	HS	mg/l			Max 1			APHA-AWWA-WEF Method	
	Oil and Grease	mg/l			Max 5			APHA-AWWA-WEF Method	
	Formaldehyde	mg/l			Max 1			APHA-AWWA-WEF Method	
	Phenols	mg/l			Max 1			APHA-AWWA-WEF Method	
Free Chlorine	mg/l			Max 1			APHA-AWWA-WEF 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-12*	Zinc	mg/l	N/A	N/A	Max 5		Twice in one year	APHA-AWWA-WEF Method		
	Chromium	mg/l			Max 0.5			AAS-Graphite Furnace Method		
	Arsenic	mg/l			Max 0.25			AAS-Graphite Furnace Method		
	Copper	mg/l			Max 1			APHA-AWWA-WEF Method		
	Mercury	mg/l			Max 0.005			APHA-AWWA-WEF Method		
	Cadmium	mg/l			Max 0.03			APHA-AWWA-WEF Method		
	Barium	mg/l			Max 1			APHA-AWWA-WEF Method		
	Selenium	mg/l			Max 0.02			APHA-AWWA-WEF Method		
	Lead	mg/l			Max 0.2			AAS-Graphite Furnace Method		
	Nickel	mg/l			Max 0.2			APHA-AWWA-WEF Method		
SW-52*	Temperature	°C	N/A	N/A	Max 40		Twice in one year	HI7609829-1 Sensor		
	pH	-			5.0-9.0			HI7609829-1 Sensor		
	SS	mg/l			Max 30			APHA-AWWA-WEF Method		
	DO	mg/l			-			>=4		HI7609829-2 Sensor
	BOD	mg/l			Max 20			APHA-AWWA-WEF Method		
	COD(Cr)	mg/l			Max 70**			Dichromate Method		
	Total Coliform	MPN/100ml			Max 400			7.5×10 ³		APHA-AWWA-WEF Method
	T-N	mg/l			Max 80			APHA-AWWA-WEF Method		
	T-P	mg/l			-			Photometric Method		
	Color	Co.Pt			Max 150			APHA-AWWA-WEF Method		
	Odor	-			-			APHA-AWWA-WEF 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 ²	HS	mg/l	N/A	N/A	Max 1		Twice in one year	APHA-AWWA-WEF Method	
	Oil and Grease	mg/l			Max 5			APHA-AWWA-WEF Method	
	Formaldehyde	mg/l			Max 1			APHA-AWWA-WEF Method	
	Phenols	mg/l			Max 1			APHA-AWWA-WEF Method	
	Free Chlorine	mg/l			Max 1			APHA-AWWA-WEF Method	
	Zinc	mg/l			Max 5			APHA-AWWA-WEF Method	
	Chromium	mg/l			Max 0.5			AAS-Graphite Furnace Method	
	Arsenic	mg/l			Max 0.25			AAS-Graphite Furnace Method	
	Copper	mg/l			Max 1			APHA-AWWA-WEF Method	
	Mercury	mg/l			Max 0.005			APHA-AWWA-WEF Method	
	Cadmium	mg/l			Max 0.03			APHA-AWWA-WEF Method	
	Barium	mg/l			Max 1			APHA-AWWA-WEF Method	
	Selenium	mg/l			Max 0.02			APHA-AWWA-WEF Method	
	Lead	mg/l			Max 0.2			AAS-Graphite Furnace Method	
Nickel	mg/l	Max 0.2	APHA-AWWA-WEF Method						
SW-6 ²	Temperature	°C	N/A	N/A	Max 40	>=4	Twice in one year	HI7609829-1 Sensor	
	pH	-			5.0-9.0			HI7609829-1 Sensor	
	SS	mg/l			Max 30			APHA-AWWA-WEF Method	
	DO	mg/l			-			HI7609829-2 Sensor	
	BOD	mg/l			Max 20			APHA-AWWA-WEF Method	
	COD(Cr)	mg/l			Max 70*			Dichromate 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 ²	Total Coliform	MPN/100ml			Max 400	7.5×10 ³		APHA-AWWA-WEF Method	
	T-N	mg/l			Max 80			APHA-AWWA-WEF Method	
	T-P	mg/l			-			Photometric Method	
	Color	Co.Pt			Max 150			APHA-AWWA-WEF Method	
	Odor	-			-			APHA-AWWA-WEF Method	
	HS	mg/l			Max 1			APHA-AWWA-WEF Method	
	Oil and Grease	mg/l			Max 5			APHA-AWWA-WEF Method	
	Formaldehyde	mg/l			Max 1			APHA-AWWA-WEF Method	
	Phenols	mg/l	N/A	N/A	Max 1		Twice in one year	APHA-AWWA-WEF Method	
	Free Chlorine	mg/l			Max 1			APHA-AWWA-WEF Method	
	Zinc	mg/l			Max 5			APHA-AWWA-WEF Method	
	Chromium	mg/l			Max 0.5			AAS-Graphite Furnace Method	
	Arsenic	mg/l			Max 0.25			AAS-Graphite Furnace Method	
	Copper	mg/l			Max 1			APHA-AWWA-WEF Method	
	Mercury	mg/l			Max 0.005			APHA-AWWA-WEF Method	
	Cadmium	mg/l			Max 0.03			APHA-AWWA-WEF Method	
	Barium	mg/l			Max 1			APHA-AWWA-WEF Method	
	Selenium	mg/l			Max 0.02			APHA-AWWA-WEF Method	
	Lead	mg/l			Max 0.2			AAS-Graphite Furnace Method	
	Nickel	mg/l			Max 0.2			APHA-AWWA-WEF 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-23* (Reference Point)	Temperature	°C	34.57	N/A	Max 40		Twice in one year	HI7609829-1 Sensor		
	pH	-	7.16		5.0-9.0			HI7609829-1 Sensor		
	SS	mg/l	123		Max 30			APHA-AWWA-WEF Method		
	DO	mg/l	12.12		-			>=4		HI7609829-2 Sensor
	BOD	mg/l	116		Max 20			APHA-AWWA-WEF Method		
	COD(Cr)	mg/l	555		Max 70*			Dichromate Method		
	Total Coliform	MPN/100ml	9.3		Max 400			7.5×10 ³		APHA-AWWA-WEF Method
	T-N	mg/l	< 1		Max 80			APHA-AWWA-WEF Method		
	T-P	mg/l	0.054		-			Photometric Method		
	Color	Co.Pt	Natural		Max 150			APHA-AWWA-WEF Method		
	Odor	-	Natural		-			APHA-AWWA-WEF Method		
	HS	mg/l	< 2		Max 1			APHA-AWWA-WEF Method		
	Oil and Grease	mg/l	< 5		Max 5			APHA-AWWA-WEF Method		
	Formaldehyde	mg/l	0.02		Max 1			APHA-AWWA-WEF Method		
	Phenols	mg/l	< 0.001		Max 1			APHA-AWWA-WEF Method		
	Free Chlorine	mg/l	< 0.01		Max 1			APHA-AWWA-WEF Method		
	Zinc	mg/l	< 0.1		Max 5			APHA-AWWA-WEF Method		
	Chromium	mg/l	< 0.02		Max 0.5			AAS-Graphite Furnace Method		
	Arsenic	mg/l	0.006		Max 0.25			AAS-Graphite Furnace Method		
	Copper	mg/l	< 0.1		Max 1			APHA-AWWA-WEF Method		
Mercury	mg/l	< 0.0005	Max 0.005	APHA-AWWA-WEF 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-2 ³ (Reference Point)	Cadmium	mg/l	< 0.002	N/A	Max 0.03		Twice in one year	APHA-AWWA-WEF Method		
	Barium	mg/l	< 0.1		Max 1			APHA-AWWA-WEF Method		
	Selenium	mg/l	< 0.01		Max 0.02			APHA-AWWA-WEF Method		
	Lead	mg/l	< 0.01		Max 0.2			AAS-Graphite Furnace Method		
	Nickel	mg/l	0.014		Max 0.2			APHA-AWWA-WEF Method		
SW-3 ³ (Reference Point)	Temperature	°C	36.86	N/A	Max 40		Twice in one year	HI7609829-1 Sensor		
	pH	-	7.48		5.0-9.0			HI7609829-1 Sensor		
	SS	mg/l	350		Max 30			APHA-AWWA-WEF Method		
	DO	mg/l	12.92		-			HI7609829-2 Sensor		
	BOD	mg/l	96		Max 20			APHA-AWWA-WEF Method		
	COD(Cr)	mg/l	560		Max 70 ⁴			Dichromate Method		
	Total Coliform	MPN/100ml	4.5		Max 400			>=4		APHA-AWWA-WEF Method
	T-N	mg/l	< 1		Max 80					APHA-AWWA-WEF Method
	T-P	mg/l	< 0.01		-					Photometric Method
	Color	Co.Pt	Natural		Max 150			7.5×10 ³		APHA-AWWA-WEF Method
	Odor	-	Natural		-					APHA-AWWA-WEF Method
	HS	mg/l	< 2		Max 1					APHA-AWWA-WEF Method
	Oil and Grease	mg/l	< 5		Max 5					APHA-AWWA-WEF Method
	Formaldehyde	mg/l	0.02		Max 1					APHA-AWWA-WEF Method
	Phenols	mg/l	< 0.001		Max 1					APHA-AWWA-WEF Method
Free Chlorine	mg/l	0.04	Max 1		APHA-AWWA-WEF 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-3* (Reference Point)	Zinc	mg/l	0.148	N/A	Max 5		Twice in one year	APHA-AWWA-WEF Method		
	Chromium	mg/l	< 0.02		Max 0.5			AAS-Graphite Furnace Method		
	Arsenic	mg/l	0.004		Max 0.25			AAS-Graphite Furnace Method		
	Copper	mg/l	< 0.1		Max 1			APHA-AWWA-WEF Method		
	Mercury	mg/l	< 0.0005		Max 0.005			APHA-AWWA-WEF Method		
	Cadmium	mg/l	< 0.002		Max 0.03			APHA-AWWA-WEF Method		
	Barium	mg/l	< 0.1		Max 1			APHA-AWWA-WEF Method		
	Selenium	mg/l	< 0.01		Max 0.02			APHA-AWWA-WEF Method		
	Lead	mg/l	< 0.01		Max 0.2			AAS-Graphite Furnace Method		
	Nickel	mg/l	< 0.01		Max 0.2			APHA-AWWA-WEF Method		
SW-4* (Reference Point)	Temperature	°C	38.44	N/A	Max 40	>=4	Twice in one year	HI7609829-1 Sensor		
	pH	-	7.87		5.0-9.0			HI7609829-1 Sensor		
	SS	mg/l	180		Max 30			APHA-AWWA-WEF Method		
	DO	mg/l	13.15		-			HI7609829-2 Sensor		
	BOD	mg/l	99		Max 20			APHA-AWWA-WEF Method		
	COD(Cr)	mg/l	545		Max 70*			Dichromate Method		
	Total Coliform	MPN/100ml	< 1.8		Max 400			7.5×10 ³		APHA-AWWA-WEF Method
	T-N	mg/l	< 1		Max 80			APHA-AWWA-WEF Method		
	T-P	mg/l	0.015		-			Photometric Method		
	Color	Co.Pt	Natural		Max 150			APHA-AWWA-WEF Method		
Odor	-	Natural	-	APHA-AWWA-WEF 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-43* (Reference Point)	HS	mg/l	< 2	N/A	Max 1		Twice in one year	APHA-AWWA-WEF Method	
	Oil and Grease	mg/l	< 5		Max 5			APHA-AWWA-WEF Method	
	Formaldehyde	mg/l	< 0.01		Max 1			APHA-AWWA-WEF Method	
	Phenols	mg/l	< 0.001		Max 1			APHA-AWWA-WEF Method	
	Free Chlorine	mg/l	< 0.01		Max 1			APHA-AWWA-WEF Method	
	Zinc	mg/l	0.123		Max 5			APHA-AWWA-WEF Method	
	Chromium	mg/l	< 0.02		Max 0.5			AAS-Graphite Furnace Method	
	Arsenic	mg/l	< 0.002		Max 0.25			AAS-Graphite Furnace Method	
	Copper	mg/l	< 0.1		Max 1			APHA-AWWA-WEF Method	
	Mercury	mg/l	< 0.0005		Max 0.005			APHA-AWWA-WEF Method	
	Cadmium	mg/l	< 0.002		Max 0.03			APHA-AWWA-WEF Method	
	Barium	mg/l	< 0.1		Max 1			APHA-AWWA-WEF Method	
	Selenium	mg/l	< 0.01		Max 0.02			APHA-AWWA-WEF Method	
	Lead	mg/l	< 0.01		Max 0.2			AAS-Graphite Furnace Method	
Nickel	mg/l	< 0.01	Max 0.2	APHA-AWWA-WEF Method					
GW-13* (Reference Point)	Temperature	°C	35.33	N/A	Max 40	>=4	Twice in one year	HI7609829-1 Sensor	
	pH	-	7.06		5.0-9.0			HI7609829-1 Sensor	
	SS	mg/l	7.67		Max 30			APHA-AWWA-WEF Method	
	DO	mg/l	6.52		-			HI7609829-2 Sensor	
	BOD	mg/l	23		Max 20			APHA-AWWA-WEF Method	
	COD(Cr)	mg/l	45.5		Max 70*			Dichromate 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)
GW-13* (Reference Point)	Total Coliform	MPN/100ml	9.2	N/A	Max 400	7.5×10 ³	Twice in one year	APHA-AWWA-WEF Method	
	T-N	mg/l	< 1		Max 80			APHA-AWWA-WEF Method	
	T-P	mg/l	0.075		-			Photometric Method	
	Color	Co.Pt	Natural		Max 150			APHA-AWWA-WEF Method	
	Odor	-	Natural		-			APHA-AWWA-WEF Method	
	HS	mg/l	< 2		Max 1			APHA-AWWA-WEF Method	
	Oil and Grease	mg/l	< 5		Max 5			APHA-AWWA-WEF Method	
	Formaldehyde	mg/l	< 0.01		Max 1			APHA-AWWA-WEF Method	
	Phenols	mg/l	< 0.001		Max 1			APHA-AWWA-WEF Method	
	Free Chlorine	mg/l	< 0.01		Max 1			APHA-AWWA-WEF Method	
	Zinc	mg/l	< 0.1		Max 5			APHA-AWWA-WEF Method	
	Chromium	mg/l	< 0.02		Max 0.5			AAS-Graphite Furnace Method	
	Arsenic	mg/l	< 0.002		Max 0.25			AAS-Graphite Furnace Method	
	Copper	mg/l	< 0.1		Max 1			APHA-AWWA-WEF Method	
	Mercury	mg/l	< 0.0005		Max 0.005			APHA-AWWA-WEF Method	
	Cadmium	mg/l	< 0.002		Max 0.03			APHA-AWWA-WEF Method	
	Barium	mg/l	< 0.1		Max 1			APHA-AWWA-WEF Method	
	Selenium	mg/l	< 0.01		Max 0.02			APHA-AWWA-WEF Method	
Lead	mg/l	< 0.01	Max 0.2		AAS-Graphite Furnace Method				
Nickel	mg/l	< 0.01	Max 0.2		APHA-AWWA-WEF Method				





¹*Remark: Referred to the Vietnam Standard (EIA Report).

²*Remarks: Two surface water points, SW-1 and SW-5, cannot be collected the sample because of no discharge from the surrounding as well as dry season due to no rainfall. When sampling the water from SW-6 during water quality monitoring, there is no discharge from sewage treatment plant (STP) in April 2016.

³*Remarks: Thilawa SEZ Zone A has only two main discharging points. SW-1, SW-5 and SW-6 are wastewater discharge points from STP. SW-2, SW-3, SW-4 and GW-1 are reference for monitoring the situation of the outside of the Thilawa SEZ Zone A and not require to monitor.

⁴* Remarks: According to the Letter Ref: No MJTD/O/15-01-105, we monitored COD by dichromate values instead of COD by permanganate. Therefore, we have adopted target level of COD by Dichromate for effluent water quality discharging to the water body is 70 mg/L which is equivalent to 35 mg/L COD by Permanganate from this EMP report

2)(b) Water Quality - June 2016

Measurement 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 Referred International Standard.

Location ^{*2}	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	-	6.55	N/A	5.0-0.9	>=4	Once in two month	pH meter, HI7609829-1 pH Sensor	
	SS ³	mg/l	138 ²		Max 30			Gravimetric method	
	DO	mg/l	5.41		-			HI7609829-2, (D.O) sensor	
	COD	mg/l	11.5		Max 70			Dichromate method	
	BOD	mg/l	1.3		Max 20			Direct inoculation method	
	Oil and Grease	mg/l	< 1		Max 5			APHA-AWWA-WEF Method	
	Cr	mg/l	0.016		Max 0.5			APHA-AWWA-WEF Method	
	Total coliforms	MPN/100ml	13		Max 400			7.5×10 ³	

Location*2	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	pH	-	6.35	N/A	5.0-0.9	≥4	Once in two month	pH meter, HI7609829-1 pH Sensor	
	SS ³	mg/l	40.5 ²		Max 30			Gravimetric method	
	DO	mg/l	5.38		-			HI7609829-2,(D.O)sensor	
	COD	mg/l	19.3		Max 70			Dichromate method	
	BOD	mg/l	1.1		Max 20			Direct inoculation method	
	Oil and Grease	mg/l	< 1		Max 5			APHA-AWWA-WEF Method	
	Cr	mg/l	0.034		Max 0.5			APHA-AWWA-WEF Method	
	Total coliforms	MPN/100ml	79		Max 400			7.5×10 ³	
SW-6	pH	-	6.47	N/A	5.0-0.9	≥4	Once in two month	pH meter, HI7609829-1 pH Sensor	
	SS ³	mg/l	48.2 ²		Max 30			Gravimetric method	
	DO	mg/l	6.12		-			HI7609829-2,(D.O)sensor	
	COD	mg/l	6.4		Max 70			Dichromate method	
	BOD	mg/l	0.8		Max 20			Direct inoculation method	
	Oil and Grease	mg/l	< 1		Max 5			APHA-AWWA-WEF Method	
	Cr	mg/l	< 0.01		Max 0.5			APHA-AWWA-WEF Method	
	Total coliforms	MPN/100ml	330		Max 400			7.5×10 ³	
SW-2 (Reference Point)	pH	-	6.51	None (Available Guideline Value determined by MOI)	5.0-9.0	≥4	Once in two month	pH meter, HI7609829-1 pH Sensor	
	SS ³	mg/l	134		Max.30			Gravimetric method	
	DO	mg/l	3.75		-			HI7609829-2,(D.O)sensor	
	COD _{Cr}	mg/l	25.7		Max. 70 ⁵			Dichromate method	
	BOD	mg/l	0.9		Max. 20			Direct inoculation method	





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Location*2	Item	Unit	Measured Value	Country's Standard	Target value to be applied	*1Referred International Standard	Frequency	Method	Note (Reason of excess of the standard)
	Oil and Grease	mg/l	<1		Max. 5			APHA-AWWA-WEF Method	
	Cr	mg/l	0.013		Max. 0.5			APHA-AWWA-WEF Method	
	Total coliforms	MPN/100ml	13		Max 400			AOAC Petrifilm Method	
SW-3 (Reference Point)	pH	-	6.49	None (Available Guideline Value determined by MOI)	5.0-9.0	>=4	Once in two month	pH meter, HI7609829-1 pH Sensor	
	SS ³	mg/l	132		Max.30			Gravimetric method	
	DO	mg/l	4.78		-			HI7609829-2,(D.O)sensor	
	COD _c	mg/l	18.9		Max. 70 ⁵			Dichromate method	
	BOD	mg/l	1.1		Max. 20			Direct inoculation method	
	Oil and Grease	mg/l	<1		Max. 5			APHA-AWWA-WEF Method	
	Cr	mg/l	0.01		Max. 0.5			APHA-AWWA-WEF Method	
	Total coliforms	MPN/100ml	790 ⁴		Max 400			AOAC Petrifilm Method	
SW-4 (Reference Point)	pH	-	6.55	None (Available Guideline Value determined by MOI)	5.0-9.0	>=4	Once in two month	pH meter, HI7609829-1 pH Sensor	
	SS ³	mg/l	183		Max.30			Gravimetric method	
	DO	mg/l	5.04		-			HI7609829-2,(D.O)sensor	
	COD	mg/l	20.1		Max. 70 ⁵			Dichromate method	
	BOD	mg/l	1.2		Max. 20			Direct inoculation method	
	Oil and Grease	mg/l	<1		Max. 5			APHA-AWWA-WEF Method	
	Cr	mg/l	0.02		Max. 0.5			APHA-AWWA-WEF Method	
	Total coliforms	MPN/100ml	130		Max 400			AOAC Petrifilm Method	
GW-1 (Reference Point)	pH	-	6.73	N/A	None	5.5~9.0	Once in two month	pH meter, HI7609829-1 pH Sensor	
	SS	mg/l	<5		(Available			50	

Location* ²	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)
Point)	DO	mg/l	6.4		Guideline	>=4		HI7609829-2,(D.O)sensor	
	CODCr	mg/l	19.5		Value	60		Dichromate method	
	BOD	mg/l	<2		determined by	15		Direct inoculation method	
	Oil and Grease	mg/l	<1		MOI)	0.1		APHA-AWWA-WEF Method	
	Cr	mg/l	<0.01			0.04		APHA-AWWA-WEF Method	
	Total coliforms	MPN/100ml	2.2			7.5×10 ³		AOAC Petrifilm Method	

¹*Remark: Referred to the Vietnam Standard (EIA Report).

²*Remarks: Thilawa SEZ Zone A has only two main discharging points. SW-1, SW-5 and SW-6 are wastewater discharge points from STP. SW-2, SW-3, SW-4 and GW-1 are reference for monitoring the situation of the outside of the Thilawa SEZ Zone A and not require to monitor.

³*Remarks: Suspended solids concentration in SW-1 and SW-5 are higher than the standard and may be effect of the possible reason are (1) natural surface water condition around this area and (2) the reverse flow from the tide condition of the natural creek. SW-6 is also higher than the standard and it may be because of unexpected large amount of rain water is coming into Sewage Treatment Plant (STP) with high suspended solids during heavy rain of this raining season.

⁴*Remarks: Total coliform content at SW-3 is higher than the standard but TSEZ discharging water from SW-1 and SW-5 are within the standard.

⁵* Remarks: According to the Letter Ref: No MJTD/O/15-01-105, we monitored COD by dichromate values instead of COD by permanganate. Therefore, we have adopted target level of COD by Dichromate for effluent water quality discharging to the water body is 70 mg/L which is equivalent to 35 mg/L COD by Permanganate from this EMP report.



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)
TNV-1	Leq (day)	dB(A)			N/A	N/A	75	Once (peak period)	Sound Level Meter	
	Leq(eve)	dB(A)					70			

*Remark: Referred to the Japan Standard (EIA Report).

Noise Level (Living Environment-Near Monastery)

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)
TNV-2	Leq (day)	dB(A)			N/A	75	Singapore	Once in 3 months	Sound Level Meter	
	Leq(eve)	dB(A)				60				
	Leq(night)	dB(A)				55				
TNV-3	Leq(day)	dB(A)			N/A	75	Singapore	Once in 3 months	Sound level Meter	
	Leq(eve)	dB(A)				60				
	Leq(night)	dB(A)				55				

*Remark: Referred to the Singapore Target Noise Standard (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) (a) Solid Waste (Disposal from construction site of the contractor)

Measurement 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 Loads	Remarks
	22-Feb-2016	Waste Disposal	6	YCDC





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2	11-Mar-2016	Waste Disposal (Sewage Damage Pipe)	10	YCDC
3	6-Apr-2016	Waste Disposal	5	YCDC
4	29-Jul-2016	Waste Disposal	6	YCDC

Remark: Attached waste disposal record (Construction Monthly Progress Report) in appendix.

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.

5) (b) Solid Waste (Disposal from admin complex compound)

Measurement 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	14-Mar-2016	General Waste Disposal	320	Golden Dowa Eco-system Myanmar Co.,Ltd
2	7-Apr-2016	General Waste Disposal	600	Golden Dowa Eco-system Myanmar Co.,Ltd
3	29-Jun-2016	General Waste Disposal	1380	Golden Dowa Eco-system Myanmar Co.,Ltd
4	28-Jul-2016	General Waste Disposal	1000	Golden Dowa Eco-system Myanmar Co.,Ltd
5	31-Aug-2016	General Waste Disposal	1220	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.

6) (a) Ground Subsidence and Hydrology-April 2016

Duration (Week)	Water Consumption		Ground Level		Frequency	Note
	Quantity	Unit	Quantity	Unit		
7-Apr-2016	118	m3/week	+ 6.990	m	Once a week	
14-Apr-2016	130	m3/week	- *1	m		
21-Apr-2016	90	m3/week	+ 6.992	m		
28-Apr-2016	110	m3/week	+ 6.995	m		

* Remarks: Attached ground subsidence and ground water usage monitoring status (Construction Monthly Progress Report) in appendix.

*1Remarks: Ground level was not measuring in 14-Apr-2016 because of no working in public holiday (Thingyan Festival- Water Festival).

(b) Ground Subsidence and Hydrology-May 2016

Duration (Week)	Water Consumption		Ground Level		Frequency	Note
	Quantity	Unit	Quantity	Unit		
5-May-2016	120	m3/week	+ 6.989	m	Once a week	
12-May-2016	180	m3/week	+ 6.987	m		
19-May-2016	107	m3/week	+ 6.991	m		
26-May-2016	169	m3/week	+ 6.994	m		

* Remarks: Attached ground subsidence and ground water usage monitoring status (Construction Monthly Progress Report) in appendix.



(c) Ground Subsidence and Hydrology-June 2016

Duration (Week)	Water Consumption		Ground Level		Frequency	Note
	Quantity	Unit	Quantity	Unit		
2-Jun-2016	124	m3/week	+ 6.997	m	Once a week	
9-Jun-2016	150	m3/week	+ 6.998	m		
16-Jun-2016	145	m3/week	+ 6.999	m		
23-Jun-2016	182	m3/week	+ 6.992	m		
30-Jun-2016	125	m3/week	+ 6.990	m		

* Remarks: Attached ground subsidence and ground water usage monitoring status (Construction Monthly Progress Report) in appendix.

(d) Ground Subsidence and Hydrology-July 2016

Duration (Week)	Water Consumption		Ground Level		Frequency	Note
	Quantity	Unit	Quantity	Unit		
7-Jul-2016	118	m3/week	+ 6.994	m	Once a week	
14-Jul-2016	165	m3/week	+ 6.996	m		
21-Jul-2016	109	m3/week	+ 6.991	m		
28-Jul-2016	113	m3/week	+ 6.993	m		

* Remarks: Attached ground subsidence and ground water usage monitoring status (Construction Monthly Progress Report) in appendix.

(e) Ground Subsidence and Hydrology-August 2016

Duration (Week)	Water Consumption		Ground Level		Frequency	Note
	Quantity	Unit	Quantity	Unit		
4-Aug-2016	123	m3/week	+ 6.994	m	Once a week	
11-Aug-2016	107	m3/week	+ 6.996	m		
18-Aug-2016	121	m3/week	+ 6.995	m		
25-Aug-2016	151	m3/week	+ 6.993	m		

* Remarks: Attached ground subsidence and ground water usage monitoring status (Construction Monthly Progress Report) in appendix.

(f) Ground Subsidence and Hydrology-September 2016

Duration (Week)	Water Consumption		Ground Level		Frequency	Note
	Quantity	Unit	Quantity	Unit		
1-Sep-2016	131	m3/week	+ 6.992	m	Once a week	
8-Sep-2016	154	m3/week	+ 6.993	m		
15-Sep-2016	142	m3/week	+ 6.994	m		
22-Sep-2016	139	m3/week	+ 6.994	m		
29-Sep-2016	156	m3/week	+ 6.995	m		

* Remarks: Attached ground subsidence and ground water usage monitoring status (Construction Monthly Progress Report) in appendix.

7) Offensive Odor (only operation phase) Not Applicable at Construction Phase Report
Complains 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 Complains 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
An Accident was occurred on 11 th July 2016 at Circle Junction area. The two vehicles were hit at the circular junction area. Nobody got injured and the two vehicles were damaged.	MJTD take the action as per following: <ul style="list-style-type: none"> - Negotiate between two parties - Remind to site manager and MD to reduce speed for all driver - Please refer to Attachment of Accident Report for detail.
An Accident was occurred on 9 th August 2016 at near Circular Junction area. The car was hit by the motorcycle while taking circular turn at the roundabout first circular pond. The motorcyclist got knee injury and was send to clinic.	MJTD take the action as per following: <ul style="list-style-type: none"> - Negotiate between two parties - Remind to reduce speed and explained the traffic rules - Please refer to Attachment of Accident Report for detail
An Accident was occurred on 11 th October 2016 at Junction point road from Gate-1 and Gate-2. Motorcycle and 4-wheels vehicle were hit at the junction point road area. The motorcyclist got fracture of the right arm.	MJTD take the action as per following: <ul style="list-style-type: none"> - Negotiate between two parties - Remind to site manager and explained the traffic rules to reduce speed in future - Please refer to Attachment of Accident Report for detail.
An Accident was occurred on 19 th October 2016 at near plot B3 and B10. The two vehicles were hit at near plot B3 and B10. Nobody got injured and the two vehicles were damaged.	MJTD take the action as per following: <ul style="list-style-type: none"> - Negotiate between two parties - Remind to reduce speed and explained the traffic rules - Please refer to Attachment of Accident Report for detail

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

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

End of Document

**Thilawa Special Economic Zone (Zone A)
Development Project –Phase 1**

Appendix

Water and Waste Water Monitoring Report

May 2016



MJTD MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED

WATER QUALITY MONITORING IN THILAWA SEZ (PHASE 1, OPERATION STAGE)

(Bi-Annual Monitoring)

May 2016



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1. INTRODUCTION

The water quality sampling points are in the Thilawa SEZ area, which is located in the Thanlyin and Kyauktan townships, about 20 km southeast of Yangon city (Figure 1). Thilawa SEZ is surrounded by ring road and accompanied with the container ports along the Yangon River.

There are two ways to access to Thilawa SEZ from Yangon city, which are the route passing through Thanlyin Bridge and also through Dagon River.

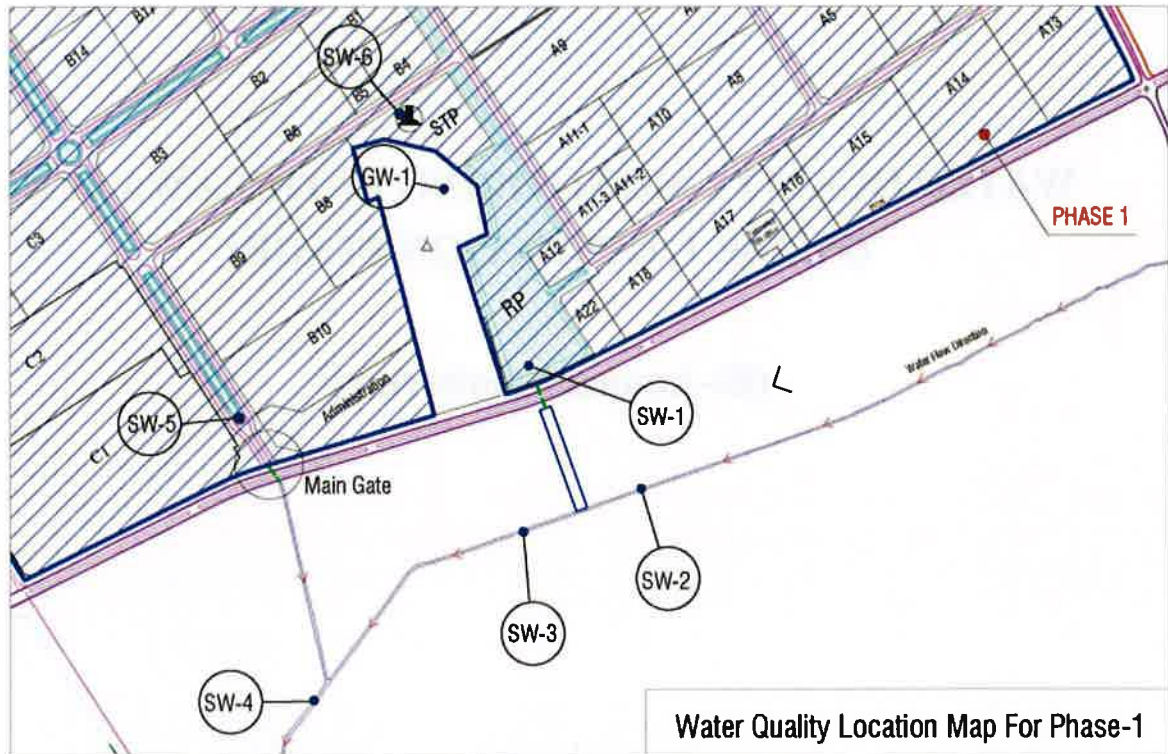


Figure 1. Location map of Thilawa SEZ area and water quality sampling locations

2. FIELD SURVEY

Water quality sampling for 4th May 2016 was conducted in 4 locations among proposed 7 locations.

Survey Item

Parameters for water quality survey are determined so as to cover the parameters of existing environmental standards. There were four locations for water quality survey as SW-2, SW-3, SW-4 and GW-1. The sample from the remaining three surface water points such as SW-1, SW-5 and SW-6, cannot be collected because of no discharge from the surrounding as well as the dry condition due to no rainfall previously.



Summary of sampling points

The detail of the locations of monitoring points are shown below.

Table 1. Locations of water quality sampling points

No.	Station	Type	Coordinate	Location
1.	SW-2	Surface Water	16° 40' 06.0" N 96° 16' 43.1" E	Upstream of Shwe Byauk Creek, Thilawa SEZ
2.	SW-3	Surface Water	16° 40' 05.5" N 96° 16' 41.6" E	Upstream of Shwe Byauk Creek, Thilawa SEZ
3.	SW-4	Surface Water	16° 39' 54.6" N 96° 16' 26.4" E	Downstream of Shwe Byauk Creek, Thilawa SEZ
4.	GW-1	Ground Water	16° 40' 25.1" N 96° 16' 31.7" E	In Moegyoe Swan Monastery, Thilawa SEZ

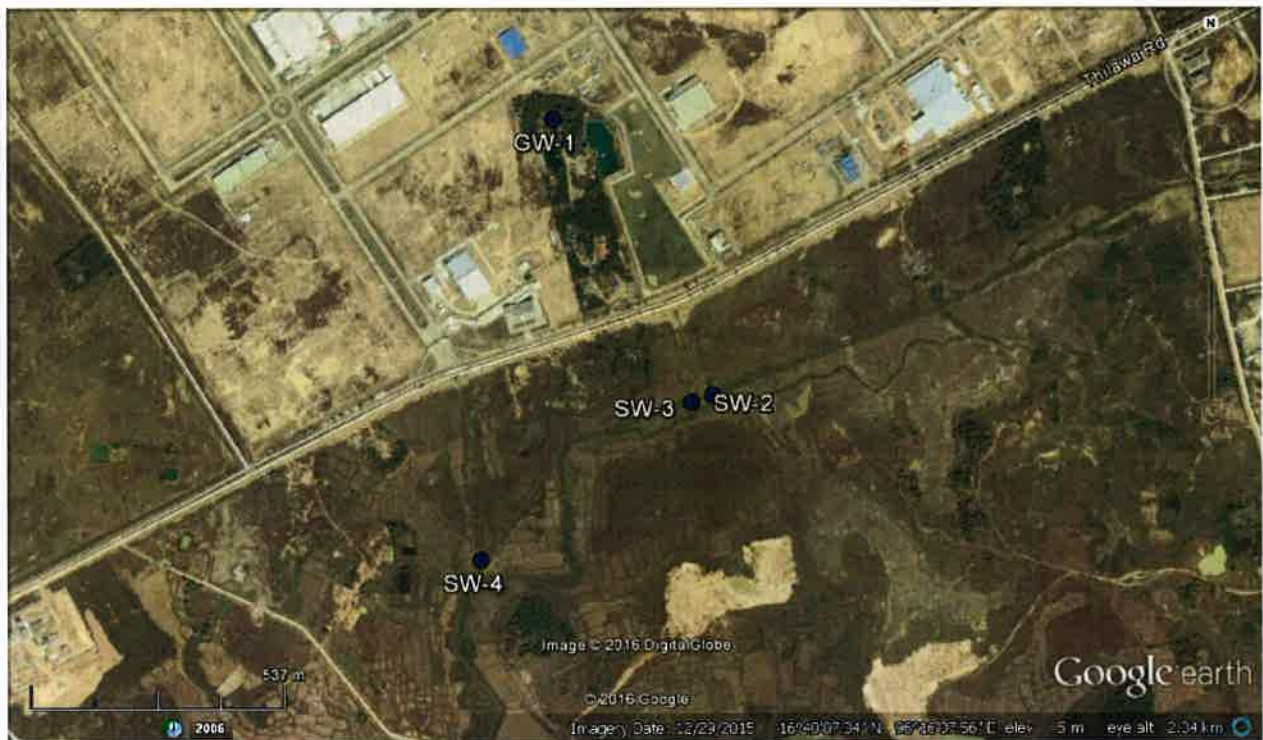


Figure 2. Location map of water quality sampling points

SW-2

SW-2 was collected at the upstream of Shwe Byauk Creek which is flowing generally from east to west and then entering into the Yangon River. This sampling point is also located at south of Zone A area and Dagon-Thilawa car road. The surrounding area are Class A in the north, industrial compound in the east and paddy field in the south and west respectively.





Figure 3. Surface water sampling at SW-2

SW-3

SW-3 was collected at the upstream of Shwe Byauk Creek which is flowing generally from east to west and then entering into the Yangon River. It is distanced about 60 m downstream of SW-2. This sampling point is also located at south of Zone A area and Dagon-Thilawa car road. The surrounding area are Zone A in the north, industrial compound in the east and paddy field in the south and west respectively.



Figure 4. Surface water sampling at SW-3

SW-4

SW-4 was collected at the downstream of Shwe Byauk Creek, which is flowing generally from east to west and then entering into the Yangon River. It is distanced about 500 m downstream of SW-3. This sampling point is also located at south of Zone A area and Dagon-Thilawa car road. The surrounding area are Zone A in the north, industrial compound in the east and paddy field in the south and west respectively.





Figure 5. Surface water sampling at SW-4

GW-1

GW-1 was collected from tube well as ground water sample. It is located in the compound of Moegyoe Swan Monastery as well as in the Zone A area. The transparency of the ground water is high.



Figure 6. Ground water sampling at GW-1

SW-1

SW-1 is located at the drain from the retention pond, which is located in the east of Moegyoswan Monastery. This drainage is flowing from north to south and then connected to the Shwe Byauk Creek. The surrounding area is most of occupied by the building.



Figure 7. Condition of SW-1 and its surrounding

SW-5

SW-5 is located at drain in front of main gate of MJTD Administrative Building. Most of the water collected in this drain is rain water and waste water from surrounding. This drain is also connected to the Shwe Byauk Creek. The surrounding area is most of occupied by the building.



Figure 8. Condition of SW-5 and its surrounding

SW-6

SW-6 is located at the outlet drain of Sewage Treatment Plant, which is located in the north of Administrative Building, distanced about 480 m. The surrounding is flat and most of the area is occupied by the building.





Figure 9. Condition of SW-6 and its surrounding

Survey Period

Water quality survey was conducted on 4th May, 2016.

Sample Point	SW-2	SW-3	SW-4	GW-1
Sampling Time	9:40 AM	10:30 AM	11:05 AM	12:05 AM

Survey Method

Water samples were taken by Alpha horizontal water sampler and collected in sterilized sample containers. All sampling was in strict accordance with recognized standard procedures. The parameters as pH, temperature, velocity, dissolved oxygen (DO), electrical conductivity (EC), and turbidity were measured at each site concurrently with sample collection. All samples were kept in iced boxes and were transported to the laboratory and stored at 2-4 °C refrigerators.

Table 2. Field Equipment for river flow measurement and water quality survey

No.	Equipment	Manufacturer	Originate Country	Model
1	Multi-parameter (Temp., pH, EC, ORP, DO, TDS, Turbidity)	HANNA	USA	HI7609829 (with 3 sensors)
2	SmarTROLL multi-parameter	In-situ Inc.	USA	-
3	Alpha Bottle (Water Sampler)	Wildlife Supply Company®	Indonesia	-



Table 3. Container and preservation method of water samples for laboratory analysis

No.	Parameter	Container	Preservation
1	BOD, COD	1000 ml glass bottle	Refrigerate
2	Oil and Grease	1000 ml glass bottle	Sulfuric acid, Refrigerate
3	Chromium (Total)	1000 ml plastic bottle	HNO ₃ , Refrigerate
4	Chlorine	1000 ml plastic bottle	Refrigerate
5	Suspended solid	1000 ml plastic bottle	Refrigerate
6	Heavy metals	3000 ml plastic bottle	Refrigerate
7	Coliform	1000 ml glass bottle	Refrigerate
8	Other	2000 ml plastic bottle	Refrigerate

The following table provides the test method for water quality.

Table 4. Analytical method for water quality

No.	Item	Analysis method	Sampling point
			SW-2, SW-3, SW-4, GW-1
1	Water Temperature	HI7609829-1 Sensor	✓
2	pH	HI7609829-1 Sensor	✓
3	Dissolved Oxygen (DO)	HI7609829-2 Sensor	✓
4	Suspended Solid	APHA-AWWA-WEF Method	✓
5	BOD	APHA-AWWA-WEF Method	✓
6	COD (Cr)	APHA 5220 D (Closed Reflux Colorimetric Method)	✓
7	Color	APHA-AWWA-WEF Method	✓
8	Odor	APHA-AWWA-WEF Method	✓
9	Total Nitrogen	APHA-AWWA-WEF Method	✓
10	Total Phosphorus	Photometric Method	✓
11	Sulphide	APHA-AWWA-WEF Method	✓
12	Oil & Grease	APHA-AWWA-WEF Method	✓
13	Formaldehyde	APHA-AWWA-WEF Method	✓
14	Phenols	APHA-AWWA-WEF Method	✓
15	Free Chloride	APHA-AWWA-WEF Method	✓
16	Zinc	APHA-AWWA-WEF Method	✓
17	Chromium (total)	AAS – Graphite Furnace Method	✓
18	Arsenic	AAS – Graphite Hydride Method	✓
19	Copper	APHA-AWWA-WEF Method	✓
20	Mercury	APHA-AWWA-WEF Method	✓
21	Cadmium	APHA-AWWA-WEF Method	✓
22	Barium	APHA-AWWA-WEF Method	✓
23	Selenium	APHA-AWWA-WEF Method	✓
24	Lead	AAS – Graphite Furnace Method	✓
25	Nickel	APHA-AWWA-WEF Method	✓
26	Total Coliform	APHA-AWWA-WEF Method	✓



Survey Result

Water samples were sent to SGS Myanmar and SGS Thailand laboratories. Water quality results are shown in following table.

This table reveals that all of the monitoring results. BOD levels of surface water points are obviously higher than the standard during this monitoring. Organic matter such as dead plants, leaves, grass clippings, manure, sewage, or even food waste in the water body are decomposed by a lot of microorganisms such as bacteria. In this case, the demand for oxygen will be high due to all the bacteria, so the BOD level will be high. Because of the high temperature of summer season during a couple of month in the area, organic waste such as dead plants, leaves and grass clippings along the Shwe Byauk Creek may be more rather than previous months. So, high BOD level is judged by the bacteria present working to decompose the organic waste.

BOD level at GW-1 is slightly higher than the standard. BOD levels against with standard shall be evaluated as yearly average or 75 percentile among all of the data in a year. Thus assessment of water quality will be evaluated after 1 year's operation.

Suspended Solid and COD(Cr) levels of surface water points are higher than the standard as previous times. Surface water sampling points at upstream area is totally influent and contaminated with Yangon River water. Since Yangon River is a tidal river, the COD(Cr) result at SW-2, SW-3 and SW-4 have possibilities of containing a large amount of chloride ions. Therefore, these results might have positive interfered by chloride ion. Certified analytical results from each laboratory are described in appendix.

Table 5. In-Situ Measurement and laboratory analysis of water quality

No.	Parameter	SW-2	SW-3	SW-4	GW-1	Standard
1	Water Temperature (C)	34.57	36.86	38.44	35.33	40
2	pH	7.16	7.48	7.87	7.06	5 - 9
3	Suspended solid (mg/l)	123	350	180	7.67	30
4	DO (mg/l)	12.12	12.92	13.15	6.52	-
5	EC (µs/cm)	8984.7	8809.2	9140.6	3570.1	-
6	Salinity (psu)	4.2	4.0	4.0	1.6	-
7	BOD (mg/l)	116	96	99	23	20
8	COD (Cr) (mg/l)	555	560	545	45.5	70
9	Color (Pt.Co)	Natural	Natural	Natural	Not Objectable	-
10	Odor	Natural	Natural	Natural	Not Objectable	-
11	Total nitrogen (mg/l)	<1	<1	<1	<1	-
12	Total phosphorus (mg/l)	0.054	<0.01	0.015	0.075	-
13	Sulphide (mg/l)	<2*	<2*	<2*	<2*	1
14	Oil and grease (mg/l)	<5	<5	<5	<5	5
15	Formaldehyde (mg/l)	0.02	0.02	<0.01	<0.01	1
16	Phenol (mg/l)	<0.001	<0.001	<0.001	<0.001	1
17	Free Chlorine (mg/l)	<0.01	0.04	<0.01	<0.01	1



No.	Parameter	SW-2	SW-3	SW-4	GW-1	Standard
18	Zinc (mg/l)	<0.1	0.148	0.123	<0.1	5
19	Chromium (mg/l)	<0.02	<0.02	<0.02	<0.02	0.5
20	Arsenic (mg/l)	0.006	0.004	<0.002	<0.002	0.25
21	Copper (mg/l)	<0.1	<0.1	<0.1	<0.1	1
22	Mercury (mg/l)	<0.0005	<0.0005	<0.0005	<0.0005	0.005
23	Cadmium (mg/l)	<0.0020	<0.0020	<0.0020	<0.002	0.03
24	Barium (mg/l)	<0.1	<0.1	<0.1	<0.1	1
25	Selenium (mg/l)	<0.01	<0.01	<0.01	<0.01	0.02
26	Lead (mg/l)	<0.010	<0.010	<0.010	<0.010	0.2
27	Nickel (mg/l)	0.014	<0.010	<0.010	<0.010	0.2
28	Total Coliform (MPN/100ml)	9.3	4.5	<1.8	9.2	400

* - As the detection limit of Sulphide is "<2", which may be complied with the standard "1".



APPENDIX

LAB RESULTS



ANALYSIS REPORT

ORIGINAL

Job Ref: 2405/2016

Date : 18.05.2016

Page 1 of 2

Client Name : **RESOURCE AND ENVIRONMENT MYANMAR CO., LTD**
 B-702 Delta Plaza, Shwegondaing Rd, Bahan Township,
 Yangon, Myanmar

Project Name : Environmental Monitoring in Thilaw SEZ, Zone A (Phase I)

Sample Brought By : Client

Sample Location : Thilawa

Sample Received Date : 05.05.2016

Analysed Date : 05.05.2016

Results (mg/l)	Methods	Stations				Detection Limit
		SW-2 (4.5.16)	SW-3 (4.5.16)	SW-4 (4.5.16)	GW-1 (4.5.16)	
Lab Code	-	085/16	086/16	087/16	084/16	-
Commodity Name	-	Surface Water	Surface Water	Surface Water	Ground Water	-
Total Suspended Solid	Based on Standard methods for the examination of water & waste water APHA , AWWA & WEF, 22nd ed, 2012; 2540 D	123	350	180	7.67	20
Total Nitrogen (organic)	Based on Standard methods for the examination of water & waste water APHA , AWWA & WEF, 22nd ed, 2012; 4500-N _{org} C	<1	<1	<1	<1	1
Sulfide	Standard methods for the examination of water & waste water APHA , AWWA & WEF, 22nd ed, 2012; 4500-S ²⁻ A&F. Iodometric Titration Method	<2	<2	<2	<2	2
Total Phosphorus	Laboratory Manual For the Physico-Chemical Analysis of Soil, Water and Plant ; Photometric (Ascorbic) Method	0.054	<0.01	0.015	0.075	0.01



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Results (mg/l)	Methods	Stations				Detection Limit
		SW-2 (4.5.16)	SW-3 (4.5.16)	SW-4 (4.5.16)	GW-1 (4.5.16)	
Lab Code	-	085/16	086/16	087/16	084/16	-
Commodity Name	-	Surface Water	Surface Water	Surface Water	Ground Water	-
Copper	Based on Standard methods for the examination of water & waste water APHA ,AWWA & WEF,22nd ed, 2012 ; 3111B (Direct Air- Acetylene Flame method)	<0.1	<0.1	<0.1	<0.1	0.1
Zinc	Based on Standard methods for the examination of water & waste water APHA ,AWWA & WEF,22nd ed, 2012 ; 3111B (Direct Air- Acetylene Flame method)	<0.1	0.148	0.123	<0.1	0.1
Oil & Grease	Based on Standard methods for the examination of water & waste water APHA ,AWWA & WEF ,22nd ed, 2012 ; 5520 B	<5	<5	<5	<5	5
BOD	In-house method based on Standard methods for the examination of water & waste water, APHA , AWWA & WEF,22nd ed, 2012 ;5210 D (Respirometric) and manual of BOD System Ox direct (Lovibond)	116	96	99	23	2
COD	In-house method based on Standard methods for the examination of water & waste water APHA , AWWA & WEF,22nd ed, 2012; 5220 D(Closed Reflux ,Colorimetric) and manual of Photometer-system MD 100 and RD 125 Reactor(Lovibond)	555	560	545	45.5	10

***** End of report *****

SGS (Myanmar) Limited

Nu Nu Yi
(Nu Nu Yi)
Manager

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Report No. : 2016-00597 / 001 (Page 1 of 1) Issued date : May 30, 2016

CLIENT : RESOURCE AND ENVIRONMENT MYANMAR CO., LTD.
CONTACT : Ms. Toe Toe Hlaing
ADDRESS : B702 Delta Plaza, Shwegondaing Rd., Bahan, Yangon, Myanmar
 Tel. +959-73013448 Fax. +951-552901
 E-mail : toetoehlainggeo@gmail.com

Analysis Report

PROJECT NAME : Environmental Monitoring in Thilaw SEZ, Zone A (Phase I)
SAMPLE DESIGNATED AS : Surface Water Quality **SAMPLING DATE :** May 4, 2016
SAMPLING LOCATION : Thilawa SEZ, Myanmar **SAMPLING BY :** Client

Parameters	Units	LOQ	Results		
			SW-2	SW-3	SW-4
Color	Pt.Co	1	Natural	Natural	Natural
Odor	-	-	Natural	Natural	Natural
Phenol	mg/l	0.001	<0.001	<0.001	<0.001
Formaldehyde	mg/l	0.01	0.02	0.02	<0.01
Free Chlorine (Cl ₂)	mg/l	0.01	<0.01	0.04	<0.01
Arsenic (As)	mg/l	0.002	0.006	0.004	<0.002
Barium (Ba)	mg/l	0.1	<0.1	<0.1	<0.1
Total Chromium (Cr)	mg/l	0.02	<0.02	<0.02	<0.02
Cadmium (Cd)	mg/l	0.0020	<0.0020	<0.0020	<0.0020
Lead (Pb)	mg/l	0.010	<0.010	<0.010	<0.010
Nickel (Ni)	mg/l	0.010	0.014	<0.010	<0.010
Mercury (Hg)	mg/l	0.0005	<0.0005	<0.0005	<0.0005
Selenium (Se)	mg/l	0.01	<0.01	<0.01	<0.01
Total Coliform Bacteria	MPN/100mL	-	9.3	4.5	<1.8

- Remarks :**
- Analysis Methods followed the Standard Methods for the Examination of Water and Wastewater endorsed by American Public Health Association (APHA), American Water Works Association (AWWA) and Water Environment Federation (WEF) except ;
 - Odor followed ISO 8588-1987.
 - Formaldehyde followed Water and Wastewater Analysis endorsed by Environmental Engineering Association of Thailand (EEAT).
 - Mercury (Hg) followed U.S. EPA method 245.1.
 - LOQ = Limit of Quantitation

Siriporn Imwilaiwan
 (Siriporn Imwilaiwan)
 Environmental Monitoring Manager



Thepsan Y.
 (Thepsan Yommana)
 Technical Manager

TY/Client/JC/Cj

SGS (THAILAND) LIMITED

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Report No. : 2016-00597 / 002 (Page 1 of 1)

Issued date : May 30, 2016

CLIENT : RESOURCE AND ENVIRONMENT MYANMAR CO., LTD.
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Analysis Report

PROJECT NAME : Environmental Monitoring in Thilaw SEZ, Zone A (Phase I)
SAMPLE DESIGNATED AS : Groundwater Quality **SAMPLING DATE :** May 4, 2016
SAMPLING LOCATION : Thilawa SEZ, Myanmar **SAMPLING BY :** Client

Parameters	Units	LOQ	Results
			GW-1
Odor	-	-	Not objectable
Color	Pt.Co	1	Not objectable
Arsenic (As)	mg/l	0.001	<0.002
Cadmium (Cd)	mg/l	0.001	<0.002
Phenol	mg/l	0.001	<0.001
Chromium Hexavalent (Cr ⁶⁺)	mg/l	0.02	<0.02
Lead (Pb)	mg/l	0.006	<0.010
Mercury (Hg)	mg/l	0.0005	<0.0005
Nickel (Ni)	mg/l	0.002	<0.010
Barium (Ba)	mg/l	0.1	<0.1
Free Chlorine (Cl ₂)	mg/l	0.01	<0.01
Selenium (Se)	mg/l	0.01	<0.01
Formaldehyde	mg/l	0.01	<0.01
Total Coliform Bacteria	MPN/100mL	-	9.2

- Remarks :**
- Analysis Methods followed the Standard Methods for the Examination of Water and Wastewater endorsed by American Public Health Association (APHA), American Water Works Association (AWWA) and Water Environment Federation (WEF) except Mercury (Hg) followed U.S. EPA method 245.1.
 - Ammonium Nitrogen (NH₄-N) is from calculation and the field data (pH and Temperature) for the calculation was measured by client.
 - LOQ = Limit of Quantitation

Siriporn I
 (Siriporn Imwilaiwan)
 Environmental Monitoring Manager

Thepson Y.
 (Thepson Yommana)
 Technical Manager



TY/Client/JC/Cj

WARNING: The sample(s) to which the findings recorded herein, the Findings state was (were) drawn and / or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted.



119734

**Thilawa Special Economic Zone (Zone A)
Development Project –Phase 1**

Appendix

Water and Waste Water Monitoring Report

June 2016



MJTD MYANMAR JAPAN THILAWA DEVELOPMENT LIMITED

WATER QUALITY MONITORING IN THILAWA SEZ (PHASE 1, OPERATION STAGE)

(Bi-Monthly Monitoring)

June 2016



Resource & Environment Myanmar Ltd. B-702/401 Delta Plaza Building, Shwegondaing Rd., Bahan, Yangon. MYANMAR

Tel: (959) 7301 3448; Fax: (951) 552901

www.enviromyanmar.net



1. INTRODUCTION

The water quality sampling points are in the Thilawa SEZ area, which is located in the Thanlyin and Kyauktan townships, about 20 km southeast of Yangon city (Figure 1). Thilawa SEZ is surrounded by ring road and accompanied with the container ports along the Yangon River.

There are two ways to access to Thilawa SEZ from Yangon city, which are the route passing through Thanlyin Bridge and also through Dagon River.

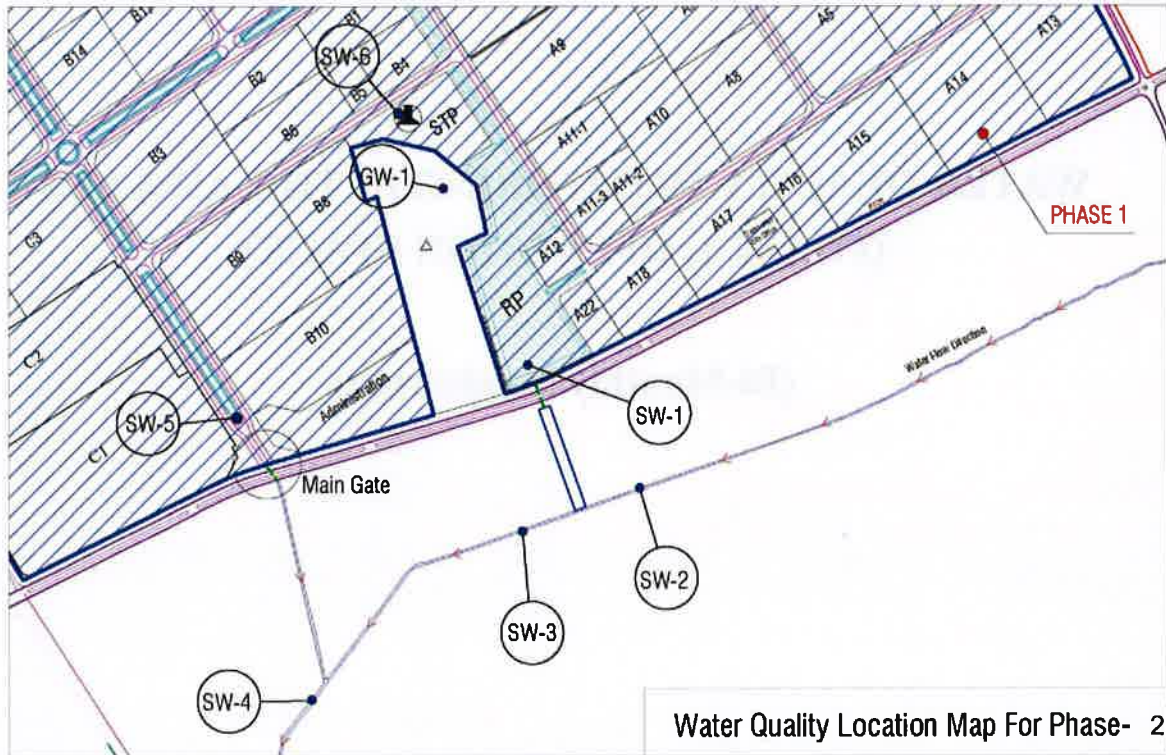


Figure 1. Location map of Thilawa SEZ area and water quality sampling locations

2. FIELD SURVEY

Water quality sampling for 21st June 2016 was conducted for proposed 7 locations.

Survey Item

Parameters for water quality survey are determined so as to cover the parameters of existing environmental standards.

Summary of sampling points

The detail of the locations of monitoring points are shown below.



Table 1. Locations of water quality sampling points

No.	Station	Type	Coordinate	Location
1.	SW-1	Surface Water	16° 40' 13.5" N 96° 16' 39.8" E	Drainage from the retention pond, Thilawa SEZ
2.	SW-2	Surface Water	16° 40' 06.0" N 96° 16' 43.1" E	Upstream of Shwe Byauk Creek, Thilawa SEZ
3.	SW-3	Surface Water	16° 40' 05.5" N 96° 16' 41.6" E	Upstream of Shwe Byauk Creek, Thilawa SEZ
4.	SW-4	Surface Water	16° 39' 54.6" N 96° 16' 26.4" E	Downstream of Shwe Byauk Creek, Thilawa SEZ
5.	SW-5	Surface Water	16° 40' 10.7" N 96° 16' 22.6" E	Drainage located in the west of MJTD main office compound
6.	SW-6	Surface Water	16° 40' 26.8" N 96° 16' 30.7" E	Drainage from the STP, Thilawa SEZ
7.	GW-1	Ground Water	16° 40' 25.1" N 96° 16' 31.7" E	In Moegyoe Swan Monastery, Thilawa SEZ



Figure 2. Location map of water quality sampling points

SW-1

SW-1 was collected at the drain from the retention pond, which is located in the east of Moegyoswan Monastery. This drainage is flowing from north to south and then connected to the Shwe Byauk Creek. The surrounding area is mostly occupied by the building.





Figure 3. Surface water sampling at SW-1

SW-2

SW-2 was collected at the upstream of Shwe Byauk Creek which is flowing generally from east to west and then entering into the Yangon River. This sampling point is also located at south of Zone A area and Dagon-Thilawa road. The surrounding area are Zone A in the north, industrial compound in the east and paddy field in the south and west respectively.



Figure 4. Surface water sampling at SW-2

SW-3

SW-3 was collected at the upstream of Shwe Byauk Creek which is flowing generally from east to west and then entering into the Yangon River. It is distanced about 60 m downstream of SW-2. This sampling point is also located at south of Zone A area and Dagon-Thilawa road. The surrounding area are Zone A in the north, industrial compound in the east and paddy field in the south and west respectively.



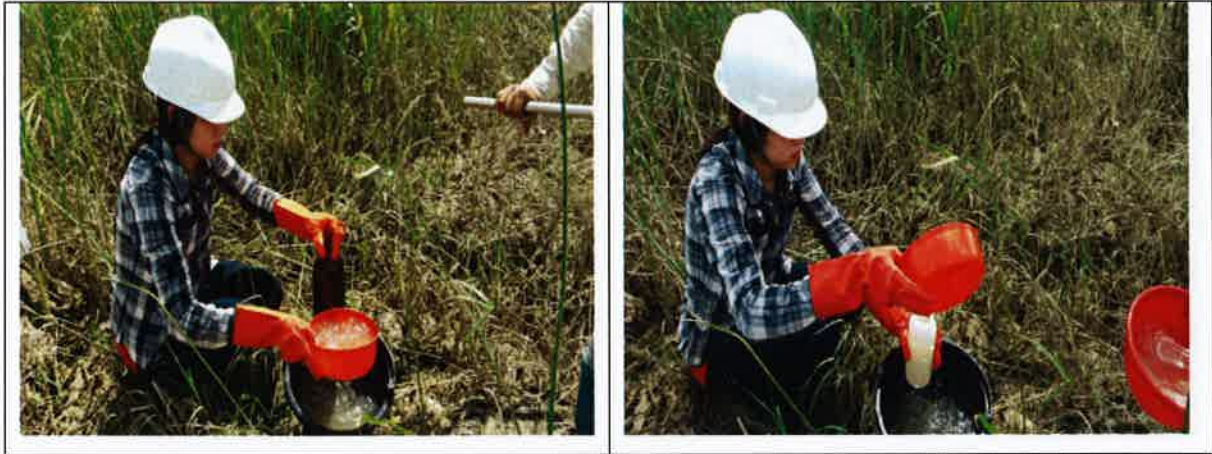


Figure 5. Surface water sampling at SW-3

SW-4

SW-4 was collected at the downstream of Shwe Byauk Creek, which is flowing generally from east to west and then entering into the Yangon River. It is distanced about 500 m downstream of SW-3. This sampling point is also located at south of Zone A area and Dagon-Thilawa road. The surrounding area are Zone A in the north, industrial compound in the east and paddy field in the south and west respectively.



Figure 6. Surface water sampling at SW-4

SW-5

SW-5 was collected at drain near the main gate of MJTD Administrative Building. Most of the water collected in this drain is rain water and waste water from surrounding. This drain is also connected to the Shwe Byauk Creek. The surrounding area is mostly occupied by the building.





Figure 7. Surface water sampling at SW-5

SW-6

SW-6 was collected from the outlet drain of Sewage Treatment Plant, which is located in the north of Administrative Building, distanced about 480 m. The surrounding is flat and most of the area is occupied by the building.



Figure 8. Ground water sampling at SW-6

GW-1

GW-1 was collected from tube well as ground water sample. It is located in the compound of Moegyoe Swan Monastery as well as in the Zone A area. The transparency of the ground water is high.





Figure 9. Ground water sampling at GW-1

Survey Period

Water quality survey was conducted on 21st June, 2016.

Sample Point	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	GW-1
Sampling Time	12:22 AM	9:14 AM	9:55 AM	10:40 AM	12:46 PM	11:59 AM	1:22 PM

Survey Method

Water samples were taken by Alpha horizontal water sampler and collected in sterilized sample containers. All sampling was in strict accordance with recognized standard procedures. The parameters as pH, temperature, velocity, dissolved oxygen (DO), electrical conductivity (EC), and turbidity were measured at each site concurrently with sample collection. All samples were kept in iced boxes and were transported to the laboratory and stored at 2-4 °C refrigerators.

Table 2. Field Equipment for river flow measurement and water quality survey

No.	Equipment	Manufacturer	Originate Country	Model
1	Multi-parameter (Temp., pH, EC, ORP, DO, TDS, Turbidity)	HANNA	USA	HI7609829 (with 3 sensors)
2	SmarTROLL multi-parameter	In-situ Inc.	USA	-
3	Alpha Bottle (Water Sampler)	Wildlife Supply Company®	Indonesia	-



Table 3. Container and preservation method of water samples for laboratory analysis

No.	Parameter	Container	Preservation
1	BOD, COD	1000 ml glass bottle	Refrigerate
2	Suspended solid	1000 ml PE	Refrigerate
3	Coliform	1000 ml glass bottle	Refrigerate
4	Total Phosphorus	500 HDPE	Refrigerate
5	Oil and Grease	1000 ml glass bottle	Refrigerate
6	Total Chromium	500 ml HDPE	Refrigerate
7	Other	2000 ml plastic bottle	Refrigerate

The following table provides the test method for water quality.

Table 4. Analytical method for water quality

No.	Item	Analysis method	Sampling point
			SW-1, SW-2, SW-3, SW-4 SW-5, SW-6, GW-1
1	Water Temperature	SmarTROLL Sensor	✓
2	pH	HI7609829-1 Sensor	✓
3	Dissolved Oxygen (DO)	HI7609829-2 Sensor	✓
4	EC	SmarTROLL Sensor	✓
5	Salinity	SmarTROLL Sensor	✓
6	Suspended Solid	Total Suspended Solids Dried	✓
7	BOD	APHA-AWWA-WEF Method	✓
8	COD (Cr)	APHA-AWWA-WEF Method	✓
9	Color	APHA-AWWA-WEF Method	✓
10	Odor	APHA-AWWA-WEF Method	✓
11	Total Nitrogen	APHA-AWWA-WEF Method	✓
12	Total Phosphorus	Persulphated Digestion and Ascorbic Acid Method	✓
13	Total Coliform	APHA-AWWA-WEF Method	✓
14	Chromium	In-House Method	✓
15	Oil and grease	Partition-Gravimetric Method	✓

Survey Result

Water samples were sent to SGS Myanmar, SGS Thailand laboratories and UAE Thailand laboratories. Water quality results are shown in following table.

Discharging points (SW-1, SW-5 and SW-6) are mentioned according to EIA and the points SW-2, SW-3 and SW-4 are not required to monitor. They are natural creek water which are combine all the wastewater from the Local industrial water and domestic water from existing living environment. Among the results, suspended solids concentration in the surface water are higher than the standard as previous time. Consequence of the situation of rainy season as well as the influence of the tidal effect of Yangon river to Shwe Byauk Creek, the concentration of suspended solids in all sampling points of surface water are high. Moreover, Total Coliform content at SW-3 is also higher than the standard. It may also be affected by the tidal water along the Shwe Byauk Creek and seepage of the



organic solvent from the surrounding area especially from the agricultural and farming activities but SW-1 and SW-5 are within the standard. The excess parameter, suspended solids, is not relating to the Thilawa's SEZ discharging points and caused by natural surface water condition around the area.

Table 5. In-Situ Measurement and laboratory analysis of water quality

No.	Parameter	SW-1	SW-2	SW-3	SW-4	SW-5	SW-6	GW-1	Standard
1	Water Temperature (°C)	36.47	30.69	31.56	32.59	37.35	31.84	35.18	40
2	pH	6.55	6.51	6.49	6.55	6.35	6.47	6.73	5 - 9
3	Suspended solid (mg/l)	138	134	132	183	40.5	48.2	<5	30
4	DO (mg/l)	5.41	3.75	4.78	5.04	5.38	6.12	6.40	-
5	EC (µs/cm)	405.4	181.3	236.4	263.8	197.6	632.7	3576.3	-
6	Salinity (psu)	0.2	0.1	0.1	0.1	0.1	0.3	1.6	-
7	BOD (mg/l)	1.3	0.9	1.1	1.2	1.1	0.8	<2	20
8	COD(Cr) (mg/l)	11.5	25.7	18.9	20.1	19.3	6.4	19.5	70
9	Color (Pt.Co)	Natural	Natural	Natural	Natural	Natural	Natural	Natural	-
10	Odor	Natural	Natural	Natural	Natural	Natural	Natural	Natural	-
11	Total nitrogen (mg/l)	<1	<1	<1	1.05	<1	1.68	1.12	-
12	Total phosphorus (mg/l)	0.03	0.01	0.01	0.02	0.02	0.05	0.03	-
13	Total Coliform (MPN/100ml)	13	13	790	130	79	330	2.2	400
14	Chromium (mg/l)	0.016	0.013	0.01	0.02	0.034	<0.01	<0.01	0.5
15	Oil and grease (mg/l)	<1	<1	<1	<1	<1	<1	<1	5



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1A
1B
2A
2B
3A
3B
4A
4B
5A
5B
6A
6B
7A
7B
8A
8B
9A
9B

APPENDIX

LAB RESULTS



ANALYSIS REPORT

ORIGINAL

Job Ref: 4022/2016

Date : 01.07.2016

Page 1 of 1

Client Name : **RESOURCE AND ENVIRONMENT MYANMAR CO., LTD**
 B-702 Delta Plaza, Shwegondaing Rd, Bahan Township,
 Yangon, Myanmar

Project Name : Environmental Monitoring in Thilawa SEZ, Zone A (Phase I)

Sample Brought By : Client

Sample Location : Thilawa

Sample Received Date : 23.06.2016

Analysed Date : 24.06.2016

Stations	Commodity Name	Lab Code	Results (mg/l)
			Total Nitrogen (organic)
Method	-	-	Standard methods for the examination of water & waste water APHA, AWWA & WEF, 22nd ed, 2012; 4500-N _{org} B.Macro Kjeldahl Method
GW-1 (21.6.16)	Ground Water	126/16	1.12
SW-1 (21.6.16)	Surface Water	120/16	<1
SW-2 (21.6.16)	Surface Water	121/16	<1
SW-3 (21.6.16)	Surface Water	122/16	<1
SW-4 (21.6.16)	Surface Water	123/16	1.05
SW-5 (21.6.16)	Surface Water	124/16	<1
SW-6 (21.6.16)	Surface Water	125/16	1.68
Detection Limit			1.0

End Of Report

SGS (Myanmar) Limited

Nu Nu Yi
 (Nu Nu Yi)
 Manager



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CLIENT : RESOURCE AND ENVIRONMENT MYANMAR CO., LTD.
CONTACT : Ms. Toe Toe Hlaing
ADDRESS : B702 Delta Plaza, Shwegondaing Rd., Bahan, Yangon, Myanmar
 Tel. +959-73013448 Fax. +951-552901
 E-mail : toetohlainggeo@gmail.com

Analysis Report

PROJECT NAME : Environmental Monitoring in Thilawa SEZ, Zone A (Phase I)
SAMPLE DESIGNATED AS : Surface Water Quality **SAMPLING DATE :** June 21, 2016
SAMPLING LOCATION : Thilawa, Myanmar **SAMPLING BY :** Client

Parameters	Units	LOQ	Results					
			SW-1	SW-2	SW-3	SW-4	SW-5	SW-6
Color	-	-	Natural	Natural	Natural	Natural	Natural	Natural
Odor	-	-	Natural	Natural	Natural	Natural	Natural	Natural
Biochemical Oxygen Demand (BOD ₅)	mg/l	2	1.3	0.9	1.1	1.2	1.1	0.8
Total Coliform Bacteria	MPN/100mL	-	13	13	790	130	79	330

Remarks :

- Analysis Methods follow the Standard Methods for the Examination of Water and Wastewater endorsed by American Public Health Association (APHA), American Water Works Association (AWWA) and Water Environment Federation (WEF) except parameters as follows :
 - Odor is base on ISO 8588-1987.
 - Color follows the visual method.
- LOQ = Limit of Quantitation

Siriporn I
 (Siriporn Imwilaiwan)

Environmental Monitoring Manager

Thepsan Y.
 (Thepsan Yommana)

Technical Manager

SGS (THAILAND) LIMITED

TY/Client/JC/Cj

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E 124141

CLIENT : RESOURCE AND ENVIRONMENT MYANMAR CO., LTD.
CONTACT : Ms. Toe Toe Hlaing
ADDRESS : B702 Delta Plaza, Shwegondaing Rd., Bahan, Yangon, Myanmar
 Tel. +959-73013448 Fax. +951-552901
 E-mail : toetoehlainggeo@gmail.com

Analysis Report

PROJECT NAME : Environmental Monitoring in Thilawa SEZ, Zone A (Phase I)
SAMPLE DESIGNATED AS : Ground Water Quality **SAMPLING DATE :** June 21, 2016
SAMPLING LOCATION : Thilawa, Myanmar **SAMPLING BY :** Client

Parameters	Units	LOQ	Results
			GW-1
Color	-	-	Natural
Odor	-	-	Natural
Biochemical Oxygen Demand (BOD ₅)	mg/l	2	<2
Total Coliform Bacteria	MPN/100mL	-	2.2

Remarks : - Analysis Methods follow the Standard Methods for the Examination of Water and Wastewater endorsed by American Public Health Association (APHA), American Water Works Association (AWWA) and Water Environment Federation (WEF) except parameters as follows :

- Odor is base on ISO 8588-1987.
- Color follows the visual method.

- LOQ = Limit of Quantitation

Siriporn 2
 (Siriporn Imwilaiwan)
 Environmental Monitoring Manager

Thepson Y.
 (Thepson Yommana)
 Technical Manager



TY/Client/JC/Cj

WARNING The sample(s) to which the findings recorded herein (and/or) were drawn and/or provided by the Client or by a third party acting at the Client's direction. The Findings constitute no warranty of the sample's representativeness of any goods and strictly relate to the sample(s). The Company accepts no liability with regard to the origin or source from which the sample(s) is/are said to be extracted.



124142

ANALYSIS REPORT

PROJECT	: ENVIRONMENTAL MONITORING IN THILAWA SEZ, ZONE A [PHASE I - SURFACE WATER ANALYSIS (JUNE 2016)]	RECEIVED DATE	: JULY 4, 2016
CUSTOMER NAME	: RESOURCE & ENVIRONMENT MYANMAR LTD. (REM)	ANALYTICAL DATE	: JULY 4-20, 2016
ADDRESS	: B-702 DELTA PLAZA, SHWEGONDAING ROAD, BAHAN, YANGON, MYANMAR. TEL. 959 7301 3448 FAX 959 5196 758	ANALYSIS NO.	: LAM081-LAM083/2016
SAMPLING SOURCE	: -	WORK NO.	: LAB2301/2016
SAMPLE TYPE	: SURFACE WATER	REPORT NO.	: L13015/2016
SAMPLING DATE	: JUNE 21, 2016		
SAMPLING TIME	: -		
SAMPLING METHOD	: -		
SAMPLING BY	: CUSTOMER		
ANALYZED BY	: MISS CHOMTHANAN APHIPATPAPHA		

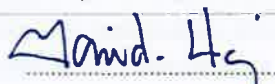
PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT			DETECTION LIMIT
			SW-1 LAM081/2016	SW-2 LAM082/2016	SW-3 LAM083/2016	
CHEMICAL OXYGEN DEMAND	mg/L	OPEN REFLUX METHOD (SM 2012:5220 B)	11.5	25.7	18.9	5.0
TOTAL SUSPENDED SOLIDS	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM 2012:2540 D)	138	134	132	5.0
FAT, OIL AND GREASE	mg/L	PARTITION-GRAVIMETRIC METHOD (SM 2012:5520 B)	ND	ND	ND	1
TOTAL CHROMIUM	mg/L Cr	IN-HOUSE METHOD UAE.TP.SW.01* (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM 2012:3030 E AND 3111 B	< LOQ	< LOQ	< LOQ	0.010
TOTAL PHOSPHORUS	mg/L P	PERSULPHATE DIGESTION AND ASCORBIC ACID METHOD (SM 2012:4500- P B AND 4500-P E)	0.03	0.01	0.01	0.01
SAMPLE CONDITION						
WATER'S COLOUR/TURBID			YELLOW/TURBID	YELLOW/TURBID	YELLOW/TURBID	
SEDIMENT			BROWN	BROWN	BROWN	

* : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 22nd EDITION, 2012.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 22nd EDITION, 2012.

ND : NON-DETECTABLE.

< LOQ : < LEVEL OF QUANTITATION (TOTAL CHROMIUM \geq 0.010 AND < 0.050 mg/L).


 (MRS MANIDA YAMYAT)

TECHNICAL MANAGEMENT
 JULY 27, 2016


 (MRS PIYAPAT SUTTAMANUTWONG)

LABORATORY SUPERVISOR
 JULY 27, 2016





United Analyst and Engineering Consultant Co., Ltd.

3 Soi Udumsuk 41, Sukhumvit Road, Bangchak, Phrakhanong, Bangkok 10260

Tel. 0 2763 2828 Fax 0 2763 2800 www.uaec consultant.com E-mail: uae@uaec consultant.com

ANALYSIS REPORT

PROJECT : ENVIRONMENTAL MONITORING IN THILAWA SEZ, ZONE A [PHASE I - SURFACE WATER ANALYSIS (JUNE 2016)]
CUSTOMER NAME : RESOURCE & ENVIRONMENT MYANMAR LTD. (REM)
ADDRESS : B-702 DELTA PLAZA, SHWEGONDAING ROAD, BAHAN, YANGON, MYANMAR. TEL. 959 7301 3448 FAX 959 5196 758
SAMPLING SOURCE :-
SAMPLE TYPE : SURFACE WATER
SAMPLING DATE : JUNE 21, 2016
SAMPLING TIME :-
SAMPLING METHOD :-
SAMPLING BY : CUSTOMER
ANALYZED BY : MISS CHOMTHANAN APHIPATPAPHA

RECEIVED DATE : JULY 4, 2016
ANALYTICAL DATE : JULY 4-20, 2016
ANALYSIS NO. : LAM084-LAM086/2016
WORK NO. : LAB2301/2016
REPORT NO. : L13016/2016

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT			DETECTION LIMIT
			SW-4 LAM084/2016	SW-5 LAM085/2016	SW-6 LAM086/2016	
CHEMICAL OXYGEN DEMAND	mg/L	OPEN REFLUX METHOD (SM 2012:5220 B)	20.1	19.3	6.4	5.0
TOTAL SUSPENDED SOLIDS	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM 2012:2540 D)	183	40.5	48.2	5.0
FAT, OIL AND GREASE	mg/L	PARTITION-GRAVIMETRIC METHOD (SM 2012:5520 B)	ND	ND	ND	1
TOTAL CHROMIUM	mg/L Cr	IN-HOUSE METHOD UAE.TP.SW.01* (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM 2012:3030 E AND 3111 B	< LOQ	< LOQ	ND	0.010
TOTAL PHOSPHORUS	mg/L P	PERSULPHATE DIGESTION AND ASCORBIC ACID METHOD (SM 2012:4500- P B AND 4500-P E)	0.02	0.02	0.05	0.01
SAMPLE CONDITION						
WATER'S COLOUR/TURBID SEDIMENT			YELLOW/TURBID BROWN	YELLOW/TURBID BROWN	YELLOW/TURBID BROWN	

* : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 22nd EDITION, 2012.
 SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 22nd EDITION, 2012.
 ND : NON-DETECTABLE.
 < LOQ : < LEVEL OF QUANTITATION (TOTAL CHROMIUM ≥ 0.010 AND < 0.050 mg/L).

Manida Yamyai
 (MRS MANIDA YAMYAI)
 TECHNICAL MANAGEMENT
 JULY 27, 2016

Piyapat Suttamanutwong
 (MRS PIYAPAT SUTTAMANUTWONG)
 LABORATORY SUPERVISOR
 JULY 27, 2016

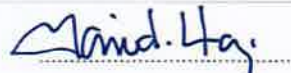
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ANALYSIS REPORT

PROJECT	: ENVIRONMENTAL MONITORING IN THILAWA SEZ, ZONE A [PHASE I - SURFACE WATER ANALYSIS (JUNE 2016)]	RECEIVED DATE	: JULY 4, 2016
CUSTOMER NAME	: RESOURCE & ENVIRONMENT MYANMAR LTD. (REM)	ANALYTICAL DATE	: JULY 4-20, 2016
ADDRESS	: B-702 DELTA PLAZA, SHWEGONDAING ROAD, BAHAN, YANGON, MYANMAR. TEL. 959 7301 3448 FAX 959 5196 758	ANALYSIS NO.	: LAM087/2016
SAMPLING SOURCE	: -	WORK NO.	: LAB2301/2016
SAMPLE TYPE	: GROUNDWATER	REPORT NO.	: L13017/2016
SAMPLING DATE	: JUNE 21, 2016		
SAMPLING TIME	: -		
SAMPLING METHOD	: -		
SAMPLING BY	: CUSTOMER		
ANALYZED BY	: MISS CHOMTHANAN APHIPATPAPHA		

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	DETECTION
			GW-1 LAM087/2016	LIMIT
CHEMICAL OXYGEN DEMAND	mg/L	OPEN REFLUX METHOD (SM 2012:5220 B)	19.5	5.0
TOTAL SUSPENDED SOLIDS	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM 2012:2540 D)	ND	5.0
FAT, OIL AND GREASE	mg/L	PARTITION-GRAVIMETRIC METHOD (SM 2012:5520 B)	ND	1
TOTAL CHROMIUM	mg/L Cr	IN-HOUSE METHOD UAE.TP.GW.01* (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM 2012:3030 E AND 3111 B	ND	0.010
TOTAL PHOSPHORUS	mg/L P	PERSULPHATE DIGESTION AND ASCORBIC ACID METHOD (SM 2012:4500- P B AND 4500-P E)	0.03	0.01
SAMPLE CONDITION				
WATER'S COLOUR/TURBID			YELLOW/CLEAR	
SEDIMENT			BROWN	

* : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 22nd EDITION, 2012.
SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 22nd EDITION, 2012.
ND : NON-DETECTABLE.


(MRS MANIDA YAMYAI)
TECHNICAL MANAGEMENT
JULY 27, 2016


(MRS PIYAPAT SUTTAMANUTWONG)
LABORATORY SUPERVISOR
JULY 27, 2016



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REPORTED ANALYSIS REFERS TO SUBMITTED SAMPLE ONLY.

**Thilawa Special Economic Zone (Zone A)
Development Project – Phase 1**

Appendix

Ground subsidence and ground water usage monitoring status

(Construction Monthly Progress Report)

April 2016 - September 2016

PENTA-SUNTAC PARTNERSHIP

Thilawa SEZ Zone A Development Project



Attachment 2.5. Ground Subsidence Monitoring Status



MONTHLY PROGRESS REPORT
ATTACHMENT 2.5- GROUND SUBSIDENCE MONITORING STATUS
PHASE-2

Sep-16

S.N	Date of performance	Predefined level of landfill(m)	Ground level over a weekly period (m)	Subsidence (m)	Sample density
1	7-Jan-16	7	6.989	-0.011	
2	14-Jan-16	7	6.990	-0.010	
3	21-Jan-16	7	6.993	-0.007	
4	28-Jan-16	7	6.996	-0.004	
5	4-Feb-16	7	6.995	-0.005	
6	11-Feb-16	7	6.989	-0.011	
7	18-Feb-16	7	6.989	-0.011	
8	25-Feb-16	7	6.992	-0.008	
9	3-Mar-16	7	6.997	-0.003	
10	10-Mar-16	7	6.995	-0.005	
11	17-Mar-16	7	6.995	-0.005	
12	24-Mar-16	7	6.990	-0.010	
13	31-Mar-16	7	6.987	-0.013	
14	7-Apr-16	7	6.990	-0.010	
15	21-Apr-16	7	6.992	-0.008	
16	28-Apr-16	7	6.995	-0.005	
17	5-May-16	7	6.989	-0.011	
18	12-May-16	7	6.987	-0.013	
19	19-May-16	7	6.991	-0.009	
20	26-May-16	7	6.994	-0.006	
21	2-Jun-16	7	6.997	-0.003	
22	9-Jun-16	7	6.998	-0.002	
23	16-Jun-16	7	6.999	-0.001	
24	23-Jun-16	7	6.992	-0.008	
25	30-Jun-16	7	6.990	-0.010	
26	7-Jul-16	7	6.994	-0.006	
27	14-Jul-16	7	6.996	-0.004	
28	21-Jul-16	7	6.991	-0.009	
29	28-Jul-16	7	6.993	-0.007	
	4-Aug-16	7	6.994	-0.006	



S.N	Date of performance	Predefined level of landfill(m)	Ground level over a weekly period (m)	Subsidence	Sample density
				(m)	
31	11-Aug-16	7	6.996	-0.004	
32	18-Aug-16	7	6.995	-0.005	
33	25-Aug-16	7	6.993	-0.007	
34	1-Sep-16	7	6.992	-0.008	
35	8-Sep-16	7	6.993	-0.007	
36	15-Sep-16	7	6.994	-0.006	
37	22-Sep-16	7	6.994	-0.006	
38	29-Sep-16	7	6.995	-0.005	



PENTA-SUNTAC PARTNERSHIP

Thilawa SEZ Zone A Development Project



PENTA-OCEAN
CONSTRUCTION CO., LTD.
五洋建設



SUNTAC
ENGINEERING & CONSTRUCTION

Attachment 2.6 - Ground Water Usage Monitoring Status



Monthly Progress Report No.34

September 2016

MONTHLY PROGRESS REPORT
ATTACHMENT 2.6 - GROUND WATER USAGE MONITORING STATUS

Sep-16

S.N	Date of Performance	Accumulative usage (volume) of ground water in site region, (m ³)	Weekly water consumption (m ³)	Remarks
1	27-Mar-14	25	25	
2	3-Apr-14	49	24	
3	9-Apr-14	65	16	
4	24-Apr-14	91	26	
5	1-May-14	134	43	
6	8-May-14	160	26	
7	15-May-14	197	37	
8	22-May-14	228	31	
9	29-May-14	259	31	
10	5-Jun-14	294	35	
11	12-Jun-14	354	60	
12	19-Jun-14	407	53	
13	26-Jun-14	458	51	
14	3-Jul-14	525	67	
15	10-Jul-14	571	46	
16	17-Jul-14	654	83	
17	24-Jul-14	747	93	
18	31-Jul-14	868	121	
19	7-Aug-14	988	120	
20	14-Aug-14	1141	153	
21	21-Aug-14	1316	175	
22	28-Aug-14	1498	182	
23	4-Sep-14	1686	188	
24	11-Sep-14	1884	198	
25	18-Sep-14	2107	223	
26	25-Sep-14	2300	193	
27	2-Oct-14	2401	101	
28	9-Oct-14	2544	143	
29	16-Oct-14	2616	132	
30	23-Oct-14	2852	176	
31	30-Oct-14	2983	131	
32	6-Nov-14	3048	65	



**MONTHLY PROGRESS REPORT
ATTACHMENT 2.6 - GROUND WATER USAGE MONITORING STATUS**

Sep-16

S.N	Date of Performance	Accumulative usage (volume) of ground water in site region, (m ³)	Weekly water consumption (m ³)	Remarks
33	13-Nov-14	3210	162	
34	20-Nov-14	3370	160	
35	27-Nov-14	3520	150	
36	4-Dec-14	3643	123	
37	11-Dec-14	3792	149	
38	18-Dec-14	3924	132	
39	25-Dec-14	4053	129	
40	1-Jan-15	4170	117	
41	8-Jan-15	4310	140	
42	15-Jan-15	4478	168	
43	22-Jan-15	4650	172	
44	29-Jan-15	4831	181	
45	5-Feb-15	5000	169	
46	12-Feb-15	5230	230	
47	19-Feb-15	5423	193	
48	26-Feb-15	5645	222	
49	5-Mar-15	5835	190	
50	12-Mar-15	6064	229	
51	19-Mar-15	6300	236	
52	26-Mar-15	6559	259	
53	2-Apr-15	6795	236	
54	9-Apr-15	7025	230	
55	16-Apr-15	7166	141	
56	23-Apr-15	7404	238	
57	30-Apr-15	7649	245	
58	7-May-15	7900	251	
59	14-May-15	8161	261	
60	21-May-15	8384	223	
61	28-May-15	8582	198	
62	4-Jun-15	8787	205	
63	11-Jun-15	8990	203	
64	18-Jun-15	9138	148	
65	25-Jun-15	9260	122	
66	2-Jul-15	9430	170	
	9-Jul-15	9560	130	
	16-Jul-15	9710	150	



MONTHLY PROGRESS REPORT
ATTACHMENT 2.6 - GROUND WATER USAGE MONITORING STATUS

Sep-16

S.N	Date of Performance	Accumulative usage (volume) of ground water in site region, (m ³)	Weekly water consumption (m ³)	Remarks
69	23-Jul-15	9880	170	
70	30-Jul-15	9990	110	
71	6-Aug-15	10240	250	
72	13-Aug-15	10440	200	
73	20-Aug-15	10668	228	
74	27-Aug-15	10948	280	
75	3-Sep-15	11150	202	
76	10-Sep-15	11400	250	
77	17-Sep-15	11597	197	
78	24-Sep-15	11800	203	
79	1-Oct-15	12000	200	
80	8-Oct-15	12240	240	
81	15-Oct-15	12370	130	
82	22-Oct-15	12620	250	
83	29-Oct-15	12740	120	
84	5-Nov-15	12915	175	
85	12-Nov-15	13155	240	
86	19-Nov-15	13323	168	
87	26-Nov-15	13578	255	
88	3-Dec-15	13790	212	
89	10-Dec-15	14102	312	
90	17-Dec-15	14378	276	
91	24-Dec-15	14589	211	
92	31-Dec-15	14780	191	
93	7-Jan-16	14991	211	
94	14-Jan-16	15212	221	
95	21-Jan-16	15353	141	
96	28-Jan-16	15560	207	
97	4-Feb-16	15700	140	
98	11-Feb-16	15876	176	
99	18-Feb-16	16128	252	
100	25-Feb-16	16343	215	
101	3-Mar-16	16450	107	
102	10-Mar-16	16670	220	
103	17-Mar-16	16778	108	
104	24-Mar-16	16889	111	



MONTHLY PROGRESS REPORT

ATTACHMENT 2.6 - GROUND WATER USAGE MONITORING STATUS

Sep-16

S.N	Date of Performance	Accumulative usage (volume) of ground water in site region, (m ³)	Weekly water consumption (m ³)	Remarks
105	31-Mar-16	17132	243	
106	7-Apr-16	17250	118	
107	14-Apr-16	17380	130	
108	21-Apr-16	17470	90	
109	28-Apr-16	17580	110	
110	5-May-16	17700	120	
111	12-May-16	17880	180	
112	19-May-16	17987	107	
113	26-May-16	18156	169	
114	2-Jun-16	18280	124	
115	9-Jun-16	18430	150	
116	16-Jun-16	18575	145	
117	23-Jun-16	18757	182	
118	30-Jun-16	18882	125	
119	7-Jul-16	19000	118	
120	14-Jul-16	19165	165	
121	21-Jul-16	19274	109	
122	28-Jul-16	19387	113	
123	4-Aug-16	19510	123	
124	11-Aug-16	19617	107	
125	18-Aug-16	19738	121	
126	25-Aug-16	19889	151	
127	1-Sep-16	20020	131	
128	8-Sep-16	20174	154	
129	15-Sep-16	20316	142	
130	22-Sep-16	20455	139	
131	29-Sep-16	20611	156	
Total Usage			20611	

**Thilawa Special Economic Zone (Zone A)
Development Project – Phase 1**

Appendix

Waste Disposal Record

(Construction Monthly Progress Report)

April 2016 - September 2016

Attachment 2.8 - Waste Disposal Record



MONTHLY PROGRESS REPORT
ATTACHMENT 2.8 - WASTE DISPOSAL MONITORING

September 2016

Item	Date	Description	No. of Loads	Remarks
1	30-Jun-14	Waste Disposal	1	YCDC
2	10-Jul-14	Waste Disposal	1	YCDC
3	11-Aug-14	Waste Disposal	1	YCDC
4	12-Aug-14	Waste Disposal	1	YCDC
5	17-Sep-14	Waste Disposal	1	YCDC
6	26-Sep-14	Waste Disposal	1	YCDC
7	29-Sep-14	Waste Disposal	1	YCDC
8	25-Oct-14	Waste Disposal	1	YCDC
9	7-Nov-14	Waste Disposal	1	YCDC
10	21-Nov-14	Waste Disposal	1	YCDC
11	1-Dec-14	Waste Disposal	2	YCDC
12	6-Dec-14	Waste Disposal (Sewage)	1	YCDC
13	24-Jan-15	Waste Disposal	2	YCDC
14	27-Jan-15	Waste Disposal	1	YCDC
15	24-Feb-15	Waste Disposal (Sewage)	1	YCDC
16	14-Mar-15	Waste Disposal	1	YCDC
17	20-Mar-15	Waste Disposal	1	YCDC
18	5-May-15	Waste Disposal	1	YCDC
19	9-May-15	Waste Disposal (Sewage)	2	YCDC
20	13-May-15	Waste Disposal	1	YCDC
21	18-May-15	Waste Disposal (Sewage)	2	YCDC
22	19-Jun-15	Waste Disposal	5	YCDC
23	1-Aug-15	Waste Disposal	6	YCDC
24	22-Sep-15	Waste Disposal	5	YCDC
25	21-Nov-15	Waste Disposal	5	YCDC
26	4-Dec-15	Waste Disposal (Sewage)	3	YCDC
27	22-Feb-16	Waste Disposal	6	YCDC
28	11-Mar-16	Waste Disposal (Sewage Damage Pipe)	10	YCDC
29	6-Apr-16	Waste Disposal	5	YCDC
	29-Jul-16	Waste Disposal	6	YCDC
Total			76	



**Thilawa Special Economic Zone (Zone A)
Development Project – Phase 1**

Appendix

General Waste Disposal Record

(Admin Complex Compound)

March 2016 - September 2016

Manifest		E-Slip		*Waste service company to Waste Generator	
Date of issuance	(Day Month, Year) 14 March, 2016	Issuer	(Name&Sign) Myo Min Thon 14.3.16		
Number of issuance	9999 1603 0001				
Contractors	Waste generator	Transportation company	Waste service company		
Company Name	Myanmar Japan Thilawa Development Ltd.	Golden Dawa Eco System Myanmar Co., Ltd.	Golden Dawa Eco-System Myanmar Co., Ltd.		
Tel					
Waste	Kind	Name	Style of packing		
	<input checked="" type="checkbox"/> Non-Hazardous	General waste	Vinyl bag		
	<input type="checkbox"/> Hazardous	Quantity(Unit)	Remark		
	<input type="checkbox"/> Others	- 320kg			
Customer code	0001	Waste Profile code	A001		
Trace	PIC(Name&Sign)		Date of Completion		
Transportation company	(Name&Sign) Kyaw Tun Mya 14.3.16 <i>[Signature]</i>		(Day Month, Year) 14.3.2016		
Waste service company	(Name&Sign) Kei Nagata 14.3.16 <i>[Signature]</i>		(Day Month, Year) 15.3.2016		
Designed by GOLDEN DAWA ECO-SYSTEM MYANMAR CO., LTD.					



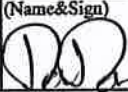
Manifest		E-Slip		*Waste service company to Waste Generator	
Date of issuance	(Day Month, Year)	Issuer	(Name&Sign)		
Number of issuance	9999 1604 0002		For - Mr Myo Min Thon		
Contractors	Waste generator	Transportation company	Waste service company		
Company Name	Myanmar Japan-Thilawa Development Limited.	Golden Dawa Eco-System Myanmar Co., Ltd.	Golden DAWA Eco-System Myanmar Co., Ltd.		
Tel					
Waste	Kind	Name	Style of packing		
	<input checked="" type="checkbox"/> Non-Hazardous	General Waste	Vinyl Bag		
	<input type="checkbox"/> Hazardous	Quantity(Unit)	Remark		
	<input type="checkbox"/> Others	600 kg.	Treatment, was completed.		
Customer code	0001	Waste Profile code	A001		
Trace	PIC(Name&Sign)		Date of Completion		
Transportation company	(Name&Sign) <i>[Signature]</i> Nwe Ko Ko Aung.		(Day Month, Year) 8.4.2016 <i>[Signature]</i> (Ko Ko Aung)		
Waste service company	(Name&Sign) <i>[Signature]</i> Win Pa Hsing		(Day Month, Year) 7.4.2016		
Designed by GOLDEN DAWA ECO-SYSTEM MYANMAR CO., LTD.					



Manifest		C-Slip		*Transportation company to Waste Generator	
Date of issuance	(Day Month, Year) 29 JUNE 2016	Issuer	(Name&Sign) Myo Mia Thein		
Number of issuance	9999 16 06 0009				
Contractors	Waste generator	Transportation company		Waste service company	
Company Name	MSTD Ltd.	Golden DOWA		Golden DOWA	
Tel					
Waste	Kind	Name		Style of packing	
	<input checked="" type="checkbox"/> Non-Hazardous	General Waste		P.P Bags.	
	<input type="checkbox"/> Hazardous	Quantity(Unit)		Remark	
	<input type="checkbox"/> Others	1980 kg			
Customer code	0001	Waste Profile code		A 001	
Trace		PIC(Name&Sign)		Date of Completion	
Transportation company		(Name&Sign) Min Mia O Hui		(Day Month, Year) 29 / 6 / 16	
Waste service company		(Name&Sign) Win Pa Pa Hking		(Day Month, Year) 29 / 6 / 2016	
Designed by GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.					

Manifest		E-Slip		*Waste service company to Waste Generator	
Date of issuance	(Day Month, Year) 28 July 2016.	Issuer	(Name&Sign) J.M.E		
Number of issuance	9999 16 07 0007.		Yamone Kheng Min (Operations)		
Contractors	Waste generator	Transportation company		Waste service company	
Company Name	MSTD	GEM		GEM	
Tel					
Waste	Kind	Name		Style of packing	
	<input checked="" type="checkbox"/> Non-Hazardous	General Waste		Plastics Bag.	
	<input type="checkbox"/> Hazardous	Quantity(Unit)		Remark	
	<input type="checkbox"/> Others	1000 kg			
Customer code	0001	Waste Profile code		A001	
Trace		PIC(Name&Sign)		Date of Completion	
Transportation company		(Name&Sign) Phu Htay Aung		(Day Month, Year) 28. 7. 2016 Dona 28/7/16 18/6/2016	
Waste service company		(Name&Sign) Win Pa Pa Hking		(Day Month, Year) 28.7.2016 28.7.2016	
Designed by GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.					



Manifest		E-Slip		*Waste service company to Waste Generator	
Date of issuance	(Day Month, Year) 31. 8. 2016	Issuer	(Name&Sign) Wai Zin Oo Mon		
Number of issuance	9999 1608 0019				
Contractors	Waste generator	Transportation company		Waste service company	
Company Name	MSTO	GEM		GEM	
Tel					
Waste	Kind	Name		Style of packing	
	<input checked="" type="checkbox"/> Non-Hazardous	General waste			
	<input type="checkbox"/> Hazardous	Quantity(Unit)		Remark	
	<input type="checkbox"/> Others	1220 kg			
Customer code	0001	Waste Profile code		A001	
Trace	PIC(Name&Sign)		Date of Completion		
Transportation company	(Name&Sign) Min Min Oo 		(Day Month, Year) 31 / 8 / 16 ၁၁၅၂၁၁၁၁ 1.9.2016		
Waste service company	(Name&Sign)  Wai Zin Oo Mon		(Day Month, Year) 31 / 8 / 2016 18/8/19/16		
Designed by GOLDEN DOWA ECO-SYSTEM MYANMAR CO., LTD.					



**Thilawa Special Economic Zone (Zone A)
Development Project – Phase 1**

Appendix

Sewage Treatment Plant Monitoring Record

April 2016 - September 2016

Sewage Treatment Plant (STP) Monitoring

Sampling Location : STP- Inlet and STP- Outlet

Monitoring Plan

Frequency of Monitoring	Analysis Parameters	Parameters
Daily	7	pH,ORP, DO, EC, TDS, Turbidity, Water Temperature, COD
Weekly	6	BOD, Total Coliform, Total Nitrogen, Total Phosphorus, Oil and Grease, Suspended Solids
Monthly	18	Cyanide, Chromium, Arsenic, Mercury, Cadmium, Selenium, Lead, Color, Odor, Zinc, Copper, Barium, Nickel, Sulphide, Free Chlorine, Formaldehyde, Phenols and Cresols

Notes: 31 parameters are monitoring in sewage treatment plant (STP)

Sampling Collecting



Figure 1 Sample collecting at Sewage Treatment Plant (STP) Inlet



Figure 2 Sample Collecting at Sewage Treatment Plant (STP) Outlet



Daily Parameter Analysis (STP)

Month	Date	Outlet (Phase - I)							
		pH	ORP (mv)	DO (mg/l)	EC (us/cm)	TDS (ppm)	Turbidity (FNU)	COD (mg/l)	Temperature (°C)
EIA Effluent standards		5.0 - 9.0	-	-	-	Max 2,000	-	Max 60	Max 40 °C
Apr	4/26/2016	6.50	113.0	1.23	475	238	22.1	-	28.50
Apr	4/27/2016	9.00	204.6	2.04	460	230	19.1	-	32.58
Apr	4/28/2016	8.56	208.5	8.16	481	240	14.4	-	32.31
Apr	4/29/2016	9.05	186.4	7.67	478	239	9.7	-	31.6
Apr	4/30/2016								
May	5/1/2016								
May	5/2/2016	8.26	219.5	5.01	491	246	43.1	-	31.41
May	5/3/2016	7.83	244.4	4.50	498	249	16.1	-	32.16
May	5/4/2016	8.06	245.7	4.13	497	248	11.2	5	31.74
May	5/5/2016	8.35	245.0	5.28	497	248	20.8	14	31.27
May	5/6/2016	8.50	214.6	3.38	489	245	6.8	5	31.40
May	5/7/2016								
May	5/8/2016								
May	5/9/2016	8.73	202.4	3.89	513	256	3.3	<0.7	31.77
May	5/10/2016	8.56	210.6	4.15	513	257	2.3	<0.7	31.86
May	5/11/2016	8.83	183.0	3.23	516	258	2.0	1.9	32.00
May	5/12/2016	7.83	226.5	3.10	525	262	9.5	<0.7	31.84
May	5/13/2016	7.42	276.9	4.0	523	261	17.7	8.7	31.81
May	5/14/2016								
May	5/15/2016								
May	5/16/2016	6.80	266.6	2.81	528	264	35.5	2	32.04
May	5/17/2016	7.09	178.2	1.14	505	252	37.6	<0.7	30.13
May	5/18/2016	8.19	205.5	2.78	524	262	4.4	<0.7	32.12
May	5/19/2016	7.68	246.8	2.82	523	262	24.7	4.3	31.94
May	5/20/2016	8.12	193.9	2.65	527	263	2.0	4.5	30.92
May	5/21/2016								
May	5/22/2016								
May	5/23/2016	7.39	225.1	2.20	507	253	109	6.7	29.82
May	5/24/2016	7.41	206.2	2.14	485	243	193	8.9	29.42
May	5/25/2016	7.96	255.3	2.03	397	199	165	<0.7	28.92
May	5/26/2016	7.60	210.1	2.36	397	199	566	<0.7	29.16
May	5/27/2016	7.82	215.8	2.31	412	206	127	<0.7	29.35
May	5/28/2016								
May	5/29/2016								
May	5/30/2016	7.77	203.9	2.16	459	229	165	1.4	29.75
May	5/31/2016	7.84	225.2	2.32	502	246	92	<0.7	29.94
Jun	6/1/2016	7.76	215.6	2.19	462	240	107	1.0	29.83
Jun	6/2/2016	7.46	245.0	1.81	475	237.00	46.10	1.0	29.97
Jun	6/3/2016	7.74	231.6	1.94	470	235.00	97.40	<0.7	29.79
Jun	6/4/2016								
Jun	6/5/2016								
Jun	6/6/2016	7.93	225.0	2.35	513	257	100	2.1	29.60
Jun	6/7/2016	7.91	225.6	2.44	528	264	77.7	1.6	29.97
Jun	6/8/2016	7.60	280.8	2.54	540	270	46.5	3.7	29.66
Jun	6/9/2016	7.28	278.3	2.95	531	266	94	1.8	29.70
Jun	6/10/2016	7.50	155.1	3.29	456	258	169	1.7	29.42
Jun	6/11/2016								
Jun	6/12/2016								
Jun	6/13/2016	7.23	460.7	4.01	447	224	351	3.1	28.96
Jun	6/14/2016	7.80	317.5	3.75	458	229	278	4.5	29.14
Jun	6/15/2016	7.62	225.3	4.38	477	239	230	<0.7	29.24
Jun	6/16/2016	7.56	225.6	4.14	507	254	149	10.0	29.31
Jun	6/17/2016	7.55	186.8	4.71	514	257	84.5	<0.7	29.35
Jun	6/18/2016								
Jun	6/19/2016								
Jun	6/20/2016	8.00	225.6	4.56	524	262	130	4.7	29.65
Jun	6/21/2016	8.16	124.0	4.81	551	276	124	0.7	30.08
Jun	6/22/2016	7.72	441.3	4.45	565	283	25.3	2.5	30.4
Jun	6/23/2016	7.91	246.1	4.56	569	284	37.9	1.0	30.16
Jun	6/24/2016	7.80	282.6	4.33	585	292	48.3	1.9	30.06
Jun	6/25/2016								
Jun	6/26/2016								
Jun	6/27/2016	7.82	197.0	5.25	443	221	419	2.40	29.17
Jun	6/28/2016	8.00	438.6	4.46	500	250	43.3	1.50	29.37
Jun	6/29/2016	7.90	558.8	4.96	552	276	27.8	<0.7	29.62
Jun	6/30/2016	7.60	559.0	5.08	571	285	26.5	<0.7	29.8
Jul	7/1/2016	7.73	451.4	5.77	589	295	52.6	1.80	29.78
Jul	7/2/2016								
Jul	7/3/2016								
Jul	7/4/2016	8.12	254.3	2.44	596	298	58.7	3.1	29.52
Jul	7/5/2016	8.35	220.4	2.02	562	282	92	4.5	29.65
Jul	7/6/2016	8.21	258.2	1.64	555	278	95.5	4.9	29.60
Jul	7/7/2016	7.41	334.2	2.80	549	275	15.5	1.5	29.33
Jul	7/8/2016	7.00	322.8	1.89	448	289	52.3	1.5	29.52
Jul	7/9/2016								
Jul	7/10/2016								
Jul	7/11/2016	8.02	329.6	0.99	438	219	554	<0.7	28.83
Jul	7/12/2016	7.61	372.0	0.71	472	236	379	<0.7	29.16
Jul	7/13/2016	7.69	313.1	0.63	441	221	420	<0.7	29.01
Jul	7/14/2016	8.26	202.8	0.67	457	228	≥1000	<0.7	28.66
Jul	7/15/2016	7.95	432.7	0.93	513	256	570	<0.7	29.18
Jul	7/16/2016								
Jul	7/17/2016								



Daily Parameter Analysis (STP)

Month	Date	Outlet (Phase - I)							
		pH	ORP (mv)	DO (mg/l)	EC (us/cm)	TDS (ppm)	Turbidity (FNU)	COD (mg/l)	Temperature (°C)
EA Effluent standard		5.0 - 9.0	-	-	-	Max 2,000	-	Max 60	Max 40 °C
Jul	7/18/2016	8.12	302.4	0.7	475	275	437	<0.7	29.27
Jul	7/19/2016								
Jul	7/20/2016	8.08	262	0.35	482	241	334	<0.7	29.34
Jul	7/21/2016	8.18	260.5	0.36	472	236	≥1000	<0.7	29.38
Jul	7/22/2016	7.89	497.0	0.37	431	215	362	<0.7	29.17
Jul	7/23/2016								
Jul	7/24/2016								
Jul	7/25/2016	7.73	524.5	0.16	565	253	317	<0.7	29.38
Jul	7/26/2016	7.91	363.2	0.11	560	280	64.2	<0.7	29.95
Jul	7/27/2016	8.38	532.8	0.21	570	285	24	2.5	29.62
Jul	7/28/2016	7.59	498.2	0.11	561	280	14.6	3.0	29.58
Jul	7/29/2016	7.81	543.4	0.25	528	264	4.1	2.0	29.70
Jul	7/30/2016								
Jul	7/31/2016								
Aug	8/1/2016	6.61	264.5	0.16	395	198	25.3	<0.7	28.91
Aug	8/2/2016	7.59	576.8	0.13	376	188	0	1.0	28.53
Aug	8/3/2016	7.56	463.7	0.25	435	217	4.8	<0.7	29.31
Aug	8/4/2016	8.03	178.4	0.03	446	223	3.5	<0.7	28.97
Aug	8/5/2016	6.51	570.1	0.29	541	270	0.5	1.8	28.72
Aug	8/6/2016								
Aug	8/7/2016								
Aug	8/8/2016	7.54	528.6	0.25	465	232	140	1.4	28.22
Aug	8/9/2016	7.84	265.7	0.23	346	173	≥1000	<0.7	27.89
Aug	8/10/2016	7.84	229.1	0.03	280	140	118	1.9	27.73
Aug	8/11/2016	8.11	510.2	0.03	363	182	441	<0.7	28.45
Aug	8/12/2016	7.93	306.2	0.16	411	205	489	<0.7	28.48
Aug	8/13/2016								
Aug	8/14/2016								
Aug	8/15/2016	7.77	554.4	0.03	391	195	136	0.7	28.14
Aug	8/16/2016	8.07	457.5	0.26	390	195	329	1.4	28.3
Aug	8/17/2016	7.91	588.9	0.01	388	194	108	<0.7	28.44
Aug	8/18/2016	7.70	551.2	0.02	433	216	72.4	<0.7	28.71
Aug	8/19/2016	8.05	574.5	0.07	524	262	5.1	<0.7	21.94
Aug	8/20/2016								
Aug	8/21/2016								
Aug	8/22/2016	8.30	265.8	0.04	572	286	0.2	<0.7	29.57
Aug	8/23/2016	8.24	614.5	0.27	547	274	86.2	<0.7	29.49
Aug	8/24/2016	7.52	626.9	0.28	609	305	51.3	2.0	29.67
Aug	8/25/2016	7.61	587.5	0.11	613	307	0.1	1.7	29.71
Aug	8/26/2016	7.88	520.5	0.04	611	306	1.9	1.6	29.55
Aug	8/27/2016								
Aug	8/28/2016								
Aug	8/29/2016	7.75	308.4	0.03	564	282	282	1.40	29.29
Aug	8/30/2016	8.28	556.2	0.04	453	226	226	<0.7	28.78
Aug	8/31/2016	7.91	327.2	0.05	396	198	198	<0.7	28.88
Sep	9/1/2016	8.14	402.40	0.05	397.00	199.00	154.00	2.10	28.81
Sep	9/2/2016	8.28	556.80	0.06	414.00	207.00	81.10	<0.7	29.11
Sep	9/3/2016								
Sep	9/4/2016								
Sep	9/5/2016	8.02	293.30	0.07	520.00	260.00	142.00	3.90	28.67
Sep	9/6/2016	8.26	603.50	0.05	525.00	262.00	38.10	3.70	28.74
Sep	9/7/2016	8.17	553.50	0.08	533.00	266.00	21.40	<0.7	29.44
Sep	9/8/2016	7.89	490.60	0.04	517.00	258.00	9.50	1.70	29.14
Sep	9/9/2016	7.57	584.60	0.12	536.00	268.00	36.20	<0.7	29.15
Sep	9/10/2016								
Sep	9/11/2016								
Sep	9/12/2016	7.88	279.50	0.19	562.00	281.00	64.70	1.00	28.16
Sep	9/13/2016								
Sep	9/14/2016	7.73	382.50	0.15	592.00	296.00	1.20	1.20	29.42
Sep	9/15/2016	7.99	434.60	0.21	589.00	294.00	31.20	0.90	28.89
Sep	9/16/2016	8.46	252.50	0.23	603.00	300.00	16.80	1.70	29.88
Sep	9/17/2016								
Sep	9/18/2016								
Sep	9/19/2016	8.51	303.50	0.02	591.00	296.00	2.20	2.20	29.31
Sep	9/20/2016	8.36	331.20	0.03	607.00	304.00	25.30	<0.7	29.54
Sep	9/21/2016	8.16	412.00	0.07	554.00	290.00	50.60	9.10	29.29
Sep	9/22/2016	8.28	395.20	0.05	557.00	278.00	3.40	9.10	29.41
Sep	9/23/2016	7.95	470.70	0.17	558.00	279.00	19.40	7.20	29.47
Sep	9/24/2016								
Sep	9/25/2016								
Sep	9/26/2016	8.17	300.8	0.02	576	288	104	2.5	29.28
Sep	9/27/2016	8.41	257.2	0.02	635	318	2.5	2.2	29.1
Sep	9/28/2016	8.51	241.8	0.10	701	351	0.1	<0.7	29.57
Sep	9/29/2016	8.36	339.3	0.28	726	363	0.1	<0.7	29.64
Sep	9/30/2016	8.06	426.2	0.34	741	370	0	<0.7	29.6



Daily Parameter Analysis (STP)

Month	Date	Outlet (Phase - II)							
		pH	ORP (mv)	DO (mg/l)	EC (us/cm)	TDS(ppm)	Turbidity(FNU)	COD (mg/l)	Temperature (°C)
EIA Effluent standard		5.0 - 9.0	-	-	-	Max 2,000	-	Max 60	Max 40 °C
Sep	9/1/2016	-	-	-	-	-	-	-	-
Sep	9/2/2016	-	-	-	-	-	-	-	-
Sep	9/3/2016								
Sep	9/4/2016								
Sep	9/5/2016	8.12	185.20	0.08	393.00	197.00	68.70	-	28.06
Sep	9/6/2016	9.12	255.70	0.07	398.00	199.00	95.50	-	29.20
Sep	9/7/2016	8.69	267.90	0.06	470.00	254.00	104.00	-	29.18
Sep	9/8/2016	7.51	322.40	0.06	445.00	223.00	111.00	-	29.02
Sep	9/9/2016	8.73	269.50	0.09	450.00	225.00	110.00	-	28.83
Sep	9/10/2016								
Sep	9/11/2016								
Sep	9/12/2016	7.87	255.80	0.21	488.00	244.00	41.80	-	28.81
Sep	9/13/2016								
Sep	9/14/2016	7.61	275.40	0.20	500.00	250.00	57.70	-	29.04
Sep	9/15/2016	7.67	326.20	0.23	526.00	263.00	53.20	-	28.82
Sep	9/16/2016	7.77	344.70	0.25	573.00	287.00	47.70	-	29.66
Sep	9/17/2016								
Sep	9/18/2016								
Sep	9/19/2016	7.89	277.80	0.17	590.00	295.00	35.90	-	29.47
Sep	9/20/2016	7.96	338.10	0.05	578.00	289.00	51.00	-	29.51
Sep	9/21/2016	7.92	352.70	0.09	560.00	298.00	25.90	12.70	29.23
Sep	9/22/2016	8.04	362.80	0.12	581.00	290.00	35.60	9.60	29.43
Sep	9/23/2016	7.81	397.40	0.06	559.00	280.00	14.00	5.00	29.68
Sep	9/24/2016								
Sep	9/25/2016								
Sep	9/26/2016	8.07	353.4	0.06	532	269	39.6	1.4	29.18
Sep	9/27/2016	8.14	387.6	0.05	556	278	51.7	<0.7	29.41
Sep	9/28/2016	8.65	296.1	0.08	556	279	40.6	<0.7	3.38
Sep	9/29/2016	8.22	346.3	0.24	561	281	37.1	<0.7	30.55
Sep	9/30/2016	8.12	398.9	0.30	581	291	27	<0.7	29.98



Weekly Parameter Analysis (STP)							
Month	Date	Outlet (Phase-1)					
		BOD	Total Coliform	Total Nitrogen	Total Phosphorous	Suspended Solids	Oil and Grease
EIA Effluent standard		Max 20	Max 400	-	-	Max 30	Max 5
May	5/4/2016	0.00	12.80	3.33	1.07	-	<5
May	5/11/2016	7.60	≥ 1600	19.00	1.30	-	<5
May	5/18/2016	17.10	1600.00	33.20	1.26	-	<5
May	5/25/2016	5.80	≥ 1600	16.60	3.23	-	<5
Jun	6/1/2016	18.60	≥ 1600	20.30	4.48	-	<5
Jun	6/8/2016	0.00	≥1600	12.60	1.42	-	<5
Jun	6/15/2016	0.00	86.00	11.30	3.23	-	<3.1
Jun	6/22/2016	1.50	<2	12.00	3.23	-	<3.1
Jun	6/29/2016	1.10	<2	10.30	1.05	-	<3.1
Jul	7/6/2016	2.60	170.00	16.40	3.09	-	<3.1
Jul	7/13/2016	3.10	23.00	10.00	3.25	-	<3.1
Jul	7/20/2016	16.00	≥1600	8.50	2.83	-	<3.1
Jul	7/27/2016	0.00	<2	8.50	2.52	-	<3.1
Aug	8/3/2016	0.00	<2	9.70	2.63	-	<3.1
Aug	8/10/2016	2.40	<2	7.50	2.41	-	<3.1
Aug	8/17/2016	3.40	<2	7.70	2.51	-	<3.1
Aug	8/24/2016	0.00	<2	13.90	2.76	-	<3.1
Aug	8/31/2016	13.70	1600.00	6.60	3.06	166.00	<3.1
Sep	9/7/2016	9.20	<2	4.90	2.68	8.00	<3.1
Sep	9/14/2016	0.00	<2	11.00	<0.05	4.00	<3.1
Sep	9/21/2016	1.50	<2	8.00	2.68	34.00	<3.1
Sep	9/28/2016	2.00	<2	9.10	0.189	14.00	<3.1

Weekly Parameter Analysis (STP)							
Month	Date	Outlet (Phase-2)					
		BOD	Total Coliform	Total Nitrogen	Total Phosphorous	Suspended Solids	Oil and Grease
EIA Effluent standard		Max 20	Max 400	-	-	Max 30	Max 5
Sep	9/21/2016	1.82	<2	6.50	8.00	<3.1	<3.1
Sep	9/28/2016	2.30	<2	5.90	18.00	<3.1	<3.1



Monthly Parameter Analysis (STP) Phase - I

STP Outlet (Phase - I) Monthly

Month	Date	STP Outlet (Phase - I) Monthly																
		Color	Odor	Mercury	Zinc	Arsenic	Chromium	Cadmium	Selenium	Lead	Copper	Barium	Nickel	Cyanide	Free Chlorine	Sulphide	Formaldehyde	Phenols
EIA Efficacy standard		-	-	Max 0.005	Max 5	Max 0.25	Max 0.5	Max 0.03	Max 0.02	Max 0.2	Max 1	Max 1	Max 0.2	Max 0.2	Max 1	Max 1	Max 1	
May	5/30/2016	-	-	≤0.00054	-	≤0.05	0.007	≤0.00086	≤0.075	≤0.04	-	-	-	0.04	-	-	-	-
Jul	7/6/2016	-	-	≤0.00054	-	<0.05	0.058	≤0.00086	<0.075	<0.04	-	-	-	0.03	-	-	-	-
Aug	8/3/2016	-	-	≤0.00054	-	<0.05	<0.007	≤0.00086	<0.075	<0.04	-	-	-	0.007	-	-	-	-
Sep	9/7/2016	-	-	≤0.00054	-	<0.05	0.04	≤0.00086	<0.075	<0.04	-	-	-	0.026	-	-	-	-
Sep	9/14/2016	0.9	1	-	0.13	-	-	-	-	-	0.02	0.03	<0.015	-	0.3	<0.005	0.006	0.009



**Thilawa Special Economic Zone (Zone A)
Development Project – Phase 1**

Appendix

Accident or Incident Case Record

March 2016 - September 2016

ACCIDENT/ INCIDENT REPORT FORM

Record No: PP-IRF-001/16

Personal details

1. Name : *U Myint Swe*

Occupation : *Driver in-charge*

Section/ Dept : *Admin*

Accident/ incident details

Date : *11.07.2016*

Time: *16:20 Hr*

Location : *Circle Junction near the Foster Factory (TSEZ)*

Reported by : *U Thein Win*

Reported to : *U Myo Thet Naung (Safety Manager)*

Description of Accident

Pro Paragon's Nissan Atlas vehicle (Ygn-4J/5731) hit Zifam's Alphard vehicle (Ygn-2K/3197)

Injury – Nature of injury (N/A)

- | | | | |
|---|---|---------------------------------------|--|
| <input type="checkbox"/> Contusion/ crush | <input type="checkbox"/> Burn | <input type="checkbox"/> Dislocation | <input type="checkbox"/> Amputation |
| <input type="checkbox"/> Laceration/ open wound | <input type="checkbox"/> Superficial injury | <input type="checkbox"/> Foreign body | <input type="checkbox"/> Internal injury |
| <input type="checkbox"/> Concussion | <input type="checkbox"/> Sprain/ strain | <input type="checkbox"/> Fracture | <input type="checkbox"/> Dermatitis |

Location of Injury (N/A)

- | | | |
|--|---|--|
| <input type="checkbox"/> Head/ face | <input type="checkbox"/> Eye | <input type="checkbox"/> Internal organs |
| <input type="checkbox"/> Hand/ fingers | <input type="checkbox"/> Shoulder/ arms | <input type="checkbox"/> Trunk (other than back) |
| <input type="checkbox"/> Hip/ leg | <input type="checkbox"/> Foot/ toes | <input type="checkbox"/> Back |
| <input type="checkbox"/> Other (state) | | |

Results of accident (N/A)

Lost time injury (LTI) _____

No. of days: _____

Worker's compensation _____

Treatment received:

First aid

Doctor

Hospital



Category of Accident

Minor

Major

Catastrophic

Full Accident Detail

The accident occurred around 16:20 Hr on 11.07.2016 at Circle Junction near Foster Factory at Thilawa SEZ. At that time, U Myint Swe was driving a pick-up vehicle (Ygn-4J/5731). When he arrived at Circle Junction near Foster Factory, his car hit another vehicle Alphard (Ygn-2K/3197) which is driving along the circle junction. The two vehicles were damaged. Nobody got injured.

Damage to equipment/buildings/vehicles etc.

- Two vehicles damaged
 1. Ygn-4J/5731(Wind shield, Front light, Back mirror)
 2. Ygn-2K/3197(Front side body, Side glass, Front tyre)

Immediate Causes:

- Pick-up vehicle hit another vehicle

Basic Causes: 1. Lack of concentration during driving

2. Not follow the driving rules

Corrective actions

- To explain driving rules and regulations.
- To control driving permit.

Date by action is to be taken: 12.7.2016

Preventive actions

- To organize mass meeting to share information and discuss the preventive measures.
- To enforce people driving at the work site to follow discipline / regulation.

To issue the notice letter that "Zero Tolerance Policy" applies for driving rules.



Signatures

Reported by:



U Thein Win (PE)

Reported to:

Naung (13.07.2016)

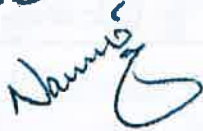
U Myo The Naung (Safety Manager)

To Follow Up-


Actions Completed on: Done


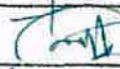







Date: 13.07.2016

Approved by HSE Manager:



Tool Box Meeting

Project Name - RK Paragon Steel	Conducted by-	Myo Thet Naung -
Location - RK (PPC Site Office)	Position -	Safety Manager.
Date - 12.07.2016	Signature -	

Description	Name	Sign
<p>Topic - Driving Safety</p> <ul style="list-style-type: none"> - Distraction occur any time you take your eye off the road, your hands off the wheel and your mind off your primary task. - All distraction endanger drivers safety. Do not do the following while driving. <ul style="list-style-type: none"> - Using a mobile phone. - Eating and drinking. - Talking and reading. - Watching a video. Follow Rules and Regulation during driving. Especially - <ul style="list-style-type: none"> - TSEZ speed limit - Circle junction (give way and driving rules). 	TIN KO Oo	
	Hlike Aung	
	Aung Myo Min	
	ONSAN E.P.	
	U. Oat. oag	
	U Zan Min	
	Aung Kyaw Tu	
	Aung Mye Mae	
	Thun Klin	



Notice for all drivers

For Vehicle Driver Guidelines and Safety Rules

- Company vehicles are to be driven by authorized driver only, in case of absent of authorized driver the Driver in-charge can assign equally competent driver.
- Any driver who has a driver's license revoked or suspended shall immediately notify the Driver in-charge and can not drive until the license is valid again.
- All accidents in company vehicles, driver must be reported immediately to Driver in-charge and office.
- Always put on seat belt during driving.
- Driver must respect the speed limits on public roads and within the construction site.
- Using mobile phones while driving is prohibited, even if a hand-free is available.
- Maintain vehicle in good condition. Check all indicators, Engine, Cables and Exhaust. This must be done before driving the vehicle.
- Obey all traffic signs
- Minimum PPE requirement are Safety Helmet, Safety Shoes, Visibility Clothes.
- The use of a company vehicle while under the influence of intoxicants and other alcohol and drugs is strictly forbidden and if this is not followed, the disciplinary actions up to termination of employment will be taken.

For Motorcycle Driver Guidelines and Safety Rules

- Driver and passenger to wear appropriate safety helmet.
- Using mobile phones while driving is prohibited, even if a hand-free is available.
- Obey all traffic signs
- Driver must respect the speed limits on public roads and within the construction site.
- Do not use umbrella while driving motorcycle.

The above following procedure shall be followed by all drivers at all levels at all places.

Naung

Myo Thet Naung

Safety Manager

Pro Paragon Construction Co., Ltd.







Incident Report

1. **Kinds of Incident** : Traffic Accident
2. **Incident Time** : 13:20 PM (9th August 2016)
3. **Location** : Near around the first circular pond
4. **Result / Action Taken** : The car was hit by the motorcycle while taking circular turn at the roundabout first circular pond. The motorcyclist got knee injury and was sent to clinic. Supervisor explained them to follow the traffic rules and not to drive over 25km per hour as they drove the vehicles carelessly without following rules and the accident will not happen again in future.

5. **Photo**



Accident Investigation Report

11-Oct, 2016

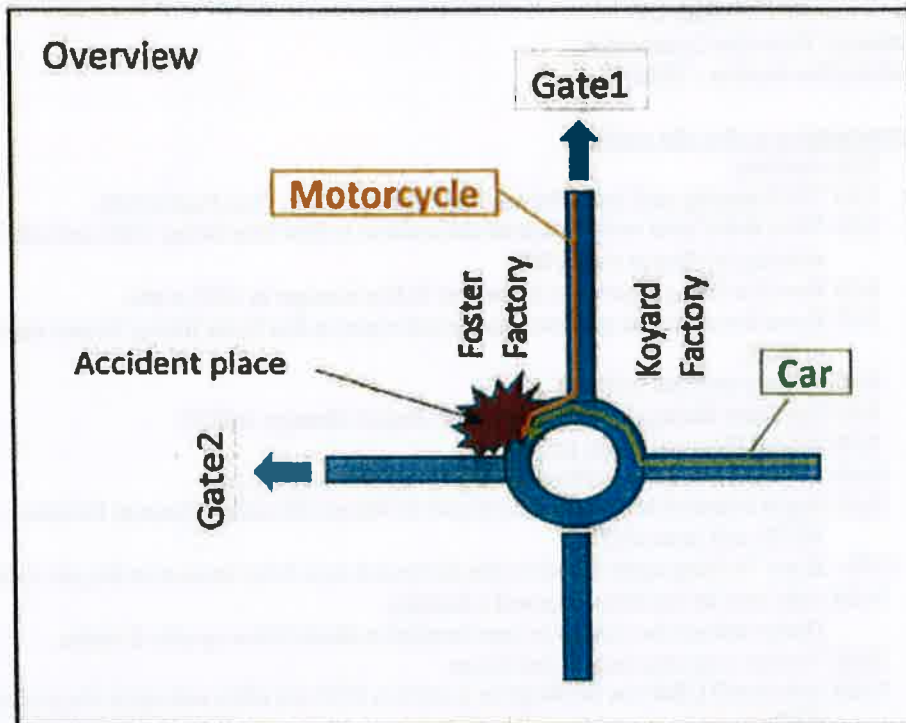
Herewith Golden Tokyu Construction Co., Ltd./ GTC report the accident that our worker involved on the way to go to GTC construction site, in TSEZ.

1. Accident situation

Time: 7:50AM, 11-October, 2016

Location: Junction point road from Gate1 and Road from Gate2 in Thilawa SEZ

Type of accident: Motorcycle and 4-wheel vehicle



Witness:

1. Ko Aung, Safety and security Officer, MJTD
2. Kywe Soe, Safety Manager, GTC
3. Wai Linn, Security In charge, MPM



2. Worker information

Transportation: Motorcycle
Rider: 1: Mos Kway Thu (32 yrs. Old), 2: Kyaw Ye Aung (28 yrs. Old)
Company: Jade Castle
Assigned work: Masonry Worker
Working Site: TSEZ, B-23/ MARUBENI MYANMAR FERTILIZER FACTORY PROJECT
Sub-Con: Seogwoo E&C
Type of Injury: Laceration, Fracture of right arm




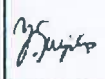


3. Opponent information

Transportation: Car
Car Driver: (s) Lin Myint Oo
Company : Kouoike Construction
Working Site location : TSEZ, C-20

4. Correspondence after the accident

- 7:50 Accident
- 7:55 TSEZ security staff found the accident, reported to Ms. Twe Twe/ MJTD.
- 8:10 Other Jade Castel worker reported the accident to Baw Baw Heing/ GTC staff after morning briefing in site/ B-23.
- 8:10 Baw Baw Heing reported to Kywe Soe/ Safety manager in GTC at site.
- 8:17 Kywe Soe arrived to accident location and report to San Kyaw Hlaing/ Project manager in B-23.
- 8:40 Security staff call to Police.
- 8:45 San Kyaw Hlaing call to Sugita/ Senior Project Manager in GTC.
- 9:00 Police officer arrived on scene
- 10:00 Victims transported to Thanlin hospital by their company car.
- 10:30 Sugita informed temporarily information to Tenant/ Marubeni Myanmar Fertilizer, and MJTD, and internal GTC.
- 11:00- Kyaw Ye Aung again consult to the doctor and took X-ray because he felt pain in his
- 14:00 right arm, he has been diagnosed a fracture.
Doctor instruct the victims to come hospital to check follow-up after 2 weeks.
- 15:00 Victims were returning to their home.
- 16:00 Jade castell (Sub-con for Seogwoo), came to GTC site office and report the progress to GTC.

Kywe Soe/GTC safety manager and Victims will visit police station in morning 12-Oct to get diagnosis that was issued by the hospital, and ask the police to open the result of investigation.

Operation Director	Administration Manager	General Manager	M/E department Manager	Senior Project Manager	Safety Manager	Project Manager
						

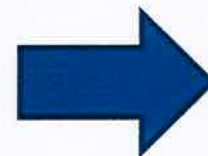


Incident Report

1. Kinds of Incident : Traffic Accident
2. Incident Time : 9:28 AM (19th October 2016)
3. Location : Near B3 & B10
4. Result/ Action Taken : Vehicle hit from PROPARAGON Company hit the vehicle from plot A10 near plot B3 and plot B10. Both of the drivers negotiated successfully and the driver from the PROPARAGON Company will take the fully responsibility of the damages. Supervisor explained them to follow the traffic rules and not to drive over 25km per hour as they drove the vehicles carelessly without following rules and the accident will not happen again in future.
5. Photos



Accident report at SeinPann road(r-10)



End of Document

