Notification of the Department of Industrial Works

Regarding Report Forms of Types and Amounts of Pollutants Discharged from a Factory

B.E. 2559 (2016)

Whereas it deemed appropriate to determine the report forms of types and amounts of pollutants discharged from a factory so that the factory is able to comply with the criteria and procedures for preparation of the report of types and amounts of pollutants discharged from the factory;

By the virtue of the provisions prescribed under Section 13.1 of the Notification of the Ministry of Industry regarding the preparation of report on types and amount of pollutants discharged from a factory B.E. 2558 (2015), the Director-General of the Department of Industrial Works announced the Notification herewith;

Article 1 This Notification is entitled "Notification of the Department of Industrial Works regarding Report Forms of Types and Amounts of Pollutants Discharged from a Factory, B.E. 2559".

Article 2 This notification shall enter into force on the day after its publication in the Government Gazette.

Article 3 The Notification of the Department of Industrial Works regarding types or categories of factory required to prepare a report of types and amounts of pollutants discharged from a factory B.E. 2553 (2010) dated 16th July 2010 shall be revoked.

Article 4 Preparation of the report of types and amounts of pollutants discharged from a factory defined in 5.1 and 5.2 of Section 5 of the Notification of the Ministry of Industry regarding a preparation of a report of types and amounts of pollutants discharged from a factory B.E. 2558 dated 6th August B.E. 2558 (2015) shall comply with the following forms;

4.1 For factories defined in 5.1;

4.1.1 the Water Pollution Report Form (RoWo.2 Form) annexed to this Notification shall be applied for the factories required to have a water pollution supervisor.

4.1.2 the Air Pollution Report Form (RoWo.3 Form) annexed to this Notification shall be applied for the factories required to have an air pollution supervisor.

4.2 For factories defined in 5.2;

4.2.1 the Water Pollution Report Form (RoWo.2 Form) annexed to this Notification shall be applied to the factories required to prepare the water pollution report.

4.2.2 the Air Pollution Report Form (RoWo.3 Form) annexed to this Notification shall be applied for the factories required to prepare the air pollution report.

4.3 The Report Forms mentioned in 4.1 and/or 4.2 shall include a preparation of general information report according to the General Information Report Form (RoWo.1 Form) annexed to this Notification.

Article 5 In case where the Department of Industrial Works has considered that the reports under Article 4 are incorrect or incomplete as the case maybe, the factory operators shall have a duty to correct or complete them, as the case maybe, and submit to the Department of Industrial Works within 45 days following the date notified by the electronic system.

Article 6 The second round reporting of the types and amounts of pollutants of a factory by RoWo.1 Form, RoWo.2 Form and RoWo.3 Form (from July to December B.E. 2558 (2015)) shall be made through the Report Forms annexed to the Notification of the Ministry of Industry regarding a preparation of a report of types and amounts of pollutants discharged from a factory B.E. 2550 dated 16th August B.E. 2550 (2007) *mutatis mutandis*.

Announced on 28th January B.E. 2559 (2016)

Pasu Loharnchun

Director-General of Department of Industrial Works

(Published in the Government Gazette, Volume 133, Part 48Ngor, dated 25th February B.E. 2559 (2016))

General Information Report Form (RoWo.1 Form) **Year……. Round ……**

(1 Report Form for 1 Factory Registration Number) **From Month ……. To Month ……**

1. Factory Information		
Factory name		Factory Reg. No.
Major factory category		Minor factory category
Address		
Factory location: GPS Latitude……..N Longitude ……E		
Located in the industrial estate/industrial zone/industrial park/industrial community		
Administrative district (Municipality/SAO)		Basin area
Business activities		
Tel.	Fax.	E-mail (for receiving official notifications)

EIA Report
O Not required
O Required as following information:

Project Name	**Approved No.**	**Dated**

2. Production

During the reporting round (6 months), production ……..days/week, ……..hours/day
no production days in total …….days

2.1 List of Main Raw Materials

Raw Materials	**Average Monthly Use**	**Unit**

2.2 List of Products

Products	**Average Monthly Production Amount**	**Unit**	**Maximum Monthly Production Amount**	**Unit**

2.3 By-Products

By-Products	**Average Monthly Production Amount**	**Unit**	**Maximum Monthly Production Amount**	**Unit**

3. Raw Water Sources for Factory Consumption

Raw Water Sources	**Average Consumption**	**Unit**	**Maximum Consumption**	**Unit**	**Measurement Method**	
					Meter	**Estimation**
Tap water		m^3/d		m^3/d		
Ground water		m^3/d		m^3/d		
Sea water		m^3/d		m^3/d		
Surface water…….		m^3/d		m^3/d		
Others……..		m^3/d		m^3/d		

4. Sources of Wastewater

4.1 For Factories in General

Sources of Wastewater	Average Amount	Unit	Maximum Amount	Unit	Management Method
Production/washing raw materials		m^3/d		m^3/d	
Cooling system		m^3/d		m^3/d	
Boiler blowdown		m^3/d		m^3/d	
Floors/machines cleaning		m^3/d		m^3/d	
Office/canteen		m^3/d		m^3/d	
Other activities……..		m^3/d		m^3/d	

4.2 For Wastewater Treatment Factories or Factories in 101 Category

Sources of Wastewater	Average Amount	Unit	Maximum Amount	Unit	Management Method
Client Factories					
On-site					

5. Wastewater Management (reporting separately by each wastewater treatment plant using RoWo.2 Form)

Average total amount of wastewater …… m^3/d
Numbers of wastewater treatment plant …… plants
Numbers of wastewater discharge points …… points

Wastewater Management Method	Average Generation	Unit	Concerned Data
On-site Wastewater Management			
Reuse		m^3/d	
Storage		m^3/d	Capacity of storage pond ……. m^3/d
Use in agricultural land on-site		m^3/d	Area ……. rai
Wastewater Discharged Off-Site			
To outside environment		m^3/d	□ Surface water …… □ Agricultural areas outside the factory …… rai Transport method…… □ Municipal collection pipes/public water channels
To central wastewater treatment plants of industrial estates/industrial zones/industrial parks/industrial communities		m^3/d	Industrial estates/industrial zones/industrial parks/industrial communities …….. Factory Reg. No. (if available) …….
To wastewater treatment factories		m^3/d	Factory Reg. No. …… Transport method……
Others			
……..		m^3/d	……

6. Emission Stacks **(reporting separately by each stack using RoWo.3 Form but excluding flare stacks)**

Total numbers of emission stacks …….. stacks (excluding flares)
During the reporting round (6 months), numbers of emission stacks used …… stacks, and numbers of emission stacks not used …….. stacks

Numbers of flares …….. stacks

7. Environmental Personnel

O Not required by the Ministry of Industry
O Required by the Ministry of Industry

Type of Personnel	First-Last Name/Consulting Company	ID Number/ Pollution Control Supervisor Registration Number	Type of Supervising	
			Water	Air
(1) Environmental Manager				
(2) Pollution Control Supervisor (2.1) Person				
(2.2) Consulting company				
(3) Pollution Control Operator				

8. Problems, Obstacles and Solutions

I certify that the above information is true.

……(sign)
( )
Factory operator or authorized person
Report verifier

……(sign)
( )
Environmental Manager
Report certifier

……(sign)
( )
Water Pollution Supervisor
Report maker

……(sign)
( )
Air Pollution Supervisor
Report maker

Wastewater Management Code (for identifying in 4)

01 Transfer to wastewater treatment plant on-site
02 Reuse on-site
03 Storage on-site
04 Use in agricultural land on-site
05 Transfer to a central wastewater treatment plant in industrial estates/industrial zones/industrial parks/industrial communities
06 Transfer to wastewater treatment factories
07 Discharge to outside environment
08 Co-incinerate in cement kilns
99 Others ……

Water Pollution Report Form (RoWo.2 Form) **Year……. Round ……**

(1 Report Form for 1 Wastewater Treatment Plant) **From Month ……. To Month ……**

1. Factory Information				
Factory name				
Factory Reg. No.		Wastewater Treatment Plant No.		
2. Wastewater Treatment Plant (WTP) Information				
O No WTP/wastewater is transported to treat off-site O WTP is available O Not required to make the report O Required to make the report				
Wastewater treatment units …… (identify in process order)				
Sources of wastewater ……				
Designed capacity …… m^3/d				
Average amount of wastewater influent …… m^3/d				
Operational time …… days/week …… hrs/day				
Non-operational days in the reporting round (6 months) …… days Reasons and solutions ……				
3. Wastewater Effluent Management				
Wastewater Effluent Management	**Average Generation**	**Unit**	**Concerned Data**	
Reuse on-site		m^3/d		
Storage on-site		m^3/d	Capacity of storage pond …… m^3/d	
Use in agricultural land on-site		m^3/d	Land area …… rai	
Discharge off-site		m^3/d	**Discharge to outside environment**	**Discharge Point No.**
			□ Surface water……	
			□ Agricultural land off-site .....rai Transport method……	
			□ Municipal collection pipes/ public water channels……	
			Treated off-site	**Discharge Point No.**
			□ Central WTP in industrial estates/industrial zones/industrial parks/industrial communities…… Factory Reg. No. (if available) …….	
			□ Wastewater treatment factories Factory Reg. No…… Transport method ……	
Others…….		m^3/d	……	
4. WTP Electricity Consumption				
Average consumption …… kWh/month				
5. Chemical/Biological Substances Used in WTP				
Chemical/Biological Substances	**Average Monthly Consumption**	**Unit**		

6. Analysis Result of Pollutants in Samples of Influent and Effluent Wastewater										
Pollutants	**Influent**					**Effluent**				
	Sampling Date		**Unit**	**Lab Reg. No.**	**Analysis Method**	**Sampling Date**		**Unit**	**Lab Reg. No.**	**Analysis Method**
pH										
BOD			mg/l					mg/l		
COD			mg/l					mg/l		
SS			mg/l					mg/l		
Temperature			℃					℃		
TDS			mg/l					mg/l		
TKN			mg/l					mg/l		
Oil & Grease			mg/l					mg/l		
Heavy Metals										
Mercury			mg/l					mg/l		
Selenium			mg/l					mg/l		
Cadmium			mg/l					mg/l		
Lead			mg/l					mg/l		
Arsenic			mg/l					mg/l		
Trivalent Chromium, Cr^{3+}			mg/l					mg/l		
Hexavalent Chromium, Cr^{6+}			mg/l					mg/l		
Barium			mg/l					mg/l		
Nickel			mg/l					mg/l		
Copper			mg/l					mg/l		
Zinc			mg/l					mg/l		
Manganese			mg/l					mg/l		
Toxic Substances										
Sulphide as H_2S			mg/l					mg/l		
Cyanide as HCN			mg/l					mg/l		
Formaldehyde			mg/l					mg/l		
Phenols Compound			mg/l					mg/l		
Pesticide			mg/l					mg/l		
Others										

7. Analysis Result of Pollutants in Samples of Influent and Effluent Wastewater (result of each discharge point)

Discharge Point No. ……

Installation of BOD – COD Online Monitoring System

O No

O Yes □ BOD □ COD which are linked to ……

Pollutants	Analysis Result of Influent and Effluent								
	Sampling Date						Unit	Lab Reg. No.	Analysis Method
pH									
BOD							mg/l		
COD							mg/l		
SS							mg/l		
Temperature							°C		
TDS							mg/l		
TKN							mg/l		
Oil & Grease							mg/l		
Heavy Metals									
Mercury							mg/l		
Selenium							mg/l		
Cadmium							mg/l		
Lead							mg/l		
Arsenic							mg/l		
Trivalent Chromium, Cr^{3+}							mg/l		
Hexavalent Chromium, Cr^{6+}							mg/l		
Barium							mg/l		
Nickel							mg/l		
Copper							mg/l		
Zinc							mg/l		
Manganese							mg/l		
Toxic Substances									
Sulphide as H_2S							mg/l		
Cyanide as HCN							mg/l		
Formaldehyde							mg/l		
Phenols Compound							mg/l		
Pesticide							mg/l		
Others									

8. Analysis Result of Pollutants in the Final Pond Where the Effluent is not Discharged Offsite					
Pollutants	**Analysis Result of Influent and Effluent**				
	Sampling Date		**Unit**	**Lab Reg. No.**	**Analysis Method**
pH					
BOD			mg/l		
COD			mg/l		
SS			mg/l		
Temperature			°C		
TDS			mg/l		
TKN			mg/l		
Oil & Grease			mg/l		
Heavy Metals					
Mercury			mg/l		
Selenium			mg/l		
Cadmium			mg/l		
Lead			mg/l		
Arsenic			mg/l		
Trivalent Chromium, Cr^{3+}			mg/l		
Hexavalent Chromium, Cr^{6+}			mg/l		
Barium			mg/l		
Nickel			mg/l		
Copper			mg/l		
Zinc			mg/l		
Manganese			mg/l		
Toxic Substances					
Sulphide as H_2S			mg/l		
Cyanide as HCN			mg/l		
Formaldehyde			mg/l		
Phenols Compound			mg/l		
Pesticide			mg/l		
Others					

9. Problems, Obstacles and Solutions

I certify that the above information is true.

……(sign)
( )
Factory operator or authorized person
Report verifier

……(sign)
( )
Environmental Manager
Report certifier

……..(sign)
( )
Water Pollution Supervisor
Report maker

Wastewater Treatment Unit Code (for identifying in 2)	
01 Oil & Grease Trap	18 Anaerobic Rotating Biological Contactor, AnBC
02 Dissolved Air Floatation, DAF	19 Anaerobic Fluidized Bed, AnFB
03 Grit Chamber	20 Oxidation Pond
04 Sand Filter	21 Stabilization Ponds
05 Neutralization	22 Aerated Lagoon, AL
06 Chemical Coagulation	23 Activated Sludge System, AS
07 Chemical Precipitation	24 Oxidation Ditch
08 Anaerobic Pond	25 Sequencing Batch Reactor, SBR
09 Anaerobic Covered Lagoon	26 Trickling Filter
10 Modified Covered Lagoon	27 Rotating Biological Contactor, RBC
11 Continuously Stirred Tank Reactor, CSTR	28 Aerobic Fluidized Bed
12 Upflow Anaerobic Sludge Blanket, UASB	29 Nitrogen Removal
13 Anaerobic Baffle Reactor, ABR	30 Phosphorus Removal
14 Plug Flow Anaerobic Digester	31 Constructed Wetland
15 Anaerobic Filter	32 Polishing Pond
16 Anaerobic Contact	33 Storage Basin
17 Anaerobic Selector Tank	99 Others…….

Air Pollution Report Form (RoWo.3 Form)

Year……. Round ……

(1 Report Form for 1 Emission Stack)

From Month ……. To Month ……

1. Factory Information		
Factory name		
Factory Reg. No.	Emission Stack No.	
2. Emission Stack Information		
Conditions of emission stack in the reporting round (6 months)	O No emission emitted from stacks Reason ……. O Emission emitted from stacks O Not required to make the report because……. O Required to make the report	
2.1 Physical Information of Emission Stacks		
Name of Emission stack		
Installation of Continuous Emission Monitoring System (CEMS) O No O Yes, which is linked to ……		
Stack location GPS Latitude ……..N Longitude……E		
Cross section of the stack	O Round	Diameter……. m
	O Rectangular	Width…… m, Length …… m
	O Square	Each side …….. m
	O Others ……	
Cross sectional area …… m^2		
Height of the stack from measured ground level …… m		
Height of the highest nearby building measured from ground level …….. m		
2.2 Emission Information		
Velocity …….. m/s		
Temperature …….. °C Oxygen content at actual condition during measurement …… %		
Flow rate at standard condition …… m^3/hr		
3. Emission Stack Operational Condition		
During the reporting round (6 month), operational day of the stack …… days average operational period …….. hrs/day		

4. Sources of Contaminants

From the process
□ Boiler having capacity ……..ton/hr
□ Smelting, casting, melting, metal processing
□ Chemical-related production process
□ Grinding, sorting, mixing, transporting, polishing or any dust generating processes
□ Combustion
□ Others …….

Having fuel combustion in these processes
O No
O Yes
O Closed system
O Open system

5. Fuel Consumption

Month	Fuel Type	Monthly Consumption	Unit	Fuel Heating Value (per one unit)	Unit	Heat Input
					Total	1.0
					Total	1.0
					Total	1.0
					Total	1.0
					Total	1.0
					Total	1.0

6. Air Pollution Treatment System

O No
O Yes, as following information:

Air Pollution Treatment Units (identify in process order)	Chemicals Used in these Facilities	Average Monthly Chemicals Consumption	Unit

7. Analysis Result of Air Pollutant Concentration Emitted from Factory Stacks						
Pollutants	**Sampling Date**	**Concentration**	**Unit**	**Lab Reg. No.**	**Data Retrieval Method**	**Analysis Method**
Total Suspended Particles (TSP)			mg/m^3			
Sulfur dioxide (SO_2)			ppm			
Oxides of Nitrogen as NO_2			ppm			
Carbon monoxide (CO)			ppm			
Chlorine (Cl_2)			mg/m^3			
Hydrogen chloride (HCL)			mg/m^3			
Hydrogen fluoride (HF)			ppm			
Hydrogen sulfide (H_2S)			ppm			
Xylene			ppm			
Cresol			ppm			
Dioxins/Furans as TEQ			ng/m^3			
Heavy Metals						
Antimony			mg/m^3			
Arsenic			mg/m^3			
Copper			mg/m^3			
Lead			mg/m^3			
Mercury			mg/m^3			
Cadmium			mg/m^3			
Chromium			mg/m^3			
Beryllium			mg/m^3			
Selenium			mg/m^3			
Tellurium			mg/m^3			
Vanadium			mg/m^3			
Cobalt			mg/m^3			
Nickel			mg/m^3			
Manganese			mg/m^3			
Tin			mg/m^3			

7. Analysis Result of Air Pollutant Concentration Emitted from Factory Stacks (Cont.)						
Pollutants	**Sampling Date**	**Concentration**	**Unit**	**Lab Reg. No.**	**Data Retrieval Method**	**Analysis Method**
Others						
Opacity			%			
Sulfuric acid			ppm			
TVOC			ppm			
Benzene			mg/m^3			
1,3-butadiene			mg/m^3			
1,2-dichloroethane			mg/m^3			
Vinyl chloride			mg/m^3			

8. Air Pollutant Emitted from Factory Stacks Required by the EIA Report			
Air Pollutants	**Loading**		**Unit**
	Actual	**EIA**	

9. Problems, Obstacles and Solutions

I certify that the above information is true.

……(sign)
( )
Factory operator or authorized person
Report verifier

……(sign)
( )
Environmental Manager
Report certifier

……(sign)
( )
Air Pollution Supervisor
Report maker

Fuel Code (for identifying in 5)				
Liquid Fuel	**Solid Fuel**	**Gaseous Fuel**	**Feedstock**	**Others**
11 Bunker A 12 Bunker B 13 Bunker C 14 Crude oil 15 Processed used-oil 16 Naphtha 17 Kerosene 18 Biodiesel 19 Diesel 20 Gasoline 21 Ethanol 29 Other liquid fuels …….	31 Anthracite 32 Bituminous 33 Sub-bituminous 34 Lignite 35 Coke 36 Charcoal 37 Biomass…… 39 Other solid fuels …….	41 NG 42 LNG 43 LPB 44 Hydrogen 45 Propane 46 Biogas 47 Coke Oven Gas 48 Converter Gas 49 Off-gas 59 Other gaseous fuels……	61 Iron, Iron ore 62 Sulfide ore 63 Coking coal 64 Raw coke 69 Other feedstocks ……..	71 Pulp effluent 72 Municipal waste 73 RDF: Refuse Derived Fuel 74 Solid waste 79 Other fuels other than 71-74 …… 81 Electricity

Air Pollution Treatment Unit Code (for identifying in 6)	
01 Settling Chamber	10 Activated Carbon Adsorber
02 Single Cyclone	11 Flue Gas Desulfurization
03 Multiple Cyclone	12 Selective Catalytic Reduction
04 Bag Filter	13 Incinerator
05 Wet Scrubber (no media)	14 Thermal Oxidizer
06 Packed-Bed Scrubber	15 Low NOx Burner
07 Venturi Scrubber	99 Others ……
08 Electrostatic Precipitator	
09 Condensation Unit	