

เอกสารแนบ 12
ผลการตรวจวิเคราะห์คุณภาพน้ำทิ้งก่อนการบำบัด
คุณภาพน้ำทิ้งหลังการบำบัด และคุณภาพน้ำที่เข้าและออกหอฟุ้งเย็น

SES-23123/WW

July 13, 2023.

Analysis Report

Customer Name : Bangkok Hospital/HuaHin
 Address : 888 Petchkasem Rd., Hua Hin, Prachuapkhirikhan 77110
 Type of Sampling : Wastewater
 Sampling date : July 5, 2023.
 Sampling by : SES

Item	Description	Unit	Method	Result		Standard ³
				ตามปกติทั่วไป		
				น้ำเข้า/น้ำดิบ (Influent) ⁴	น้ำทิ้ง/น้ำออกจากระบบ (Effluent)	
	Sample condition	-	-	yellow turbid slight sediment foul smell	light yellow slight sediment	-
1	pH	-	Electrometric	6.95	6.88	5.0-9.0
2	BOD (Biochemical Oxygen Demand)	mg/L	5 Days BOD Test	107	8	≤20
3	COD (Chemical Oxygen Demand)	mg/L	Close Reflux, Titrimetric	-	53	≤120 ¹²⁾
4	SS (Suspended Solids)	mg/L	Dried at 103-105°C	52.63	4.14	≤30
5	Settleable Solids	ml/L	Volumetric	-	<0.1	≤0.5
6	TDS (Total Dissolve Solids)	mg/L	Dried at 180°C	-	278	≤500
7	Sulfide	mg/L	Methylene Blue, Titrimetric	2.61	<0.01	≤1
8	TKN (Total Kjeldahl Nitrogen)	mg/L	Macro-Kjeldahl, Titrimetric	92.65	9.46	≤35
9	Oil & Grease	mg/L	Partition-Gravimetric	15.3	1.3	≤20
10	Total Coliform Bacteria	MPN/100ml	Multiple Tube Fermentation Technique	>1.6×10 ⁵	2.7×10 ⁵	≤5,000 ¹³⁾
11	Fecal Coliform Bacteria	MPN/100ml	Multiple Tube Fermentation Technique	-	5.4×10 ²	≤1,000 ¹³⁾
12	Residual Free Chlorine	mg/L	DPD Ferrous Titrimetric	-	<0.01	≤1.0 ¹²⁾

Method : Based on Standard Method for the Examination of Water and Wastewater, APHA, 2000A, 22nd Edition 2017Standard : ¹⁴⁾ Notification of the Ministry of Natural Resources and Environment Building (B.E. 2548)¹²⁾ Notification of the Ministry of Natural Resources and Environment (B.E. 2559)¹³⁾ Notification of the National Environment Board No. 8 (B.E. 2537)

Remark : TDS in the effluent increase from TDS in water supply (TDS in water supply = 150 mg/L)

Thai Environmental Technic Limited

Analyst

Private Laboratory Registered no. 7-236

Approved By

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SES-23142/WW

August 15, 2023.

Analysis Report

Customer Name : Bangkok Hospital/HuaHin
Address : 888 Petchkasem Rd., Hua Hin, Prachuapkhirikhan 77110
Type of Sampling : Wastewater
Sampling date : August 2, 2023.
Sampling by : SES

Item	Description	Unit	Method	Result		Standard ⁽¹⁾
				ระบบบำบัดน้ำเสีย		
				น้ำเสียเข้าระบบ (Influent)*	น้ำที่ออกจากระบบ (Effluent)	
	Sample condition	-	-	yellow turbid slight sediment foul smell	light yellow slight sediment	-
1	pH	-	Electrometric	6.75	6.81	5.0-9.0
2	BOD (Biochemical Oxygen Demand)	mg/L	5 Days BOD Test	114	6	≤20
3	COD (Chemical Oxygen Demand)	mg/L	Close Reflux, Titrimetric	-	34	≤120 ⁽²⁾
4	SS (Suspended Solids)	mg/L	Dried at 103-105°C	69.86	2.77	≤30
5	Settleable Solids	ml/L	Volumetric	-	<0.1	≤0.5
6	TDS (Total Dissolve Solids)	mg/L	Dried at 180°C	-	380	≤500
7	Sulfide	mg/L	Methylene Blue, Titrimetric	2.94	<0.01	≤1
8	TKN (Total Kjeldahl Nitrogen)	mg/L	Macro-Kjeldahl, Titrimetric	101.80	6.12	≤35
9	Oil & Grease	mg/L	Partition-Gravimetric	16.2	1.0	≤20
10	Total Coliform Bacteria	MPN/100ml	Multiple Tube Fermentation Technique	>1.6×10 ⁵	450	≤5,000 ⁽³⁾
11	Fecal Coliform Bacteria	MPN/100ml	Multiple Tube Fermentation Technique	-	94	≤1,000 ⁽³⁾
12	Residual Free Chlorine	mg/L	DPD Ferrous Titrimetric	-	<0.01	≤1.0 ⁽²⁾

Method : Based on Standard Method for the Examination of Water and Wastewater, APHA, AWWA, WEF 23rd Edition 2017

Standard : ⁽¹⁾Notification of the Ministry of Natural Resources and Environment; Building (B.E.2548)

⁽²⁾Notification of the Ministry of Natural Resources and Environment (B.E.2559)

⁽³⁾Notification of the National Environment Board No.8 (B.E.2537)

Remark : TDS in the effluent increase from TDS in water supply (TDS in water supply = 170 mg/L)

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Analysis Report

Customer Name : Bangkok Hospital/HuaHin
 Address : 888 Petchkasem Rd., HuaHin, Prachuapkhirikhan 77110
 Type of Sampling : Wastewater
 Sampling date : September 1, 2023.
 Sampling by : SES

Item	Description	Unit	Method	Result		Standard ⁹
				ตามปกติทั่วไป		
				น้ำเข้า/น้ำดิบ (Influent) ⁸	น้ำทิ้ง/น้ำออกจากระบบ (Effluent)	
	Sample condition	-	-	yellow turbid slight sediment foul smell	light yellow	-
1	pH	-	Electrometric	6.74	6.49	5.0-9.0
2	BOD (Biochemical Oxygen Demand)	mg/L	5 Days BOD Test	109	3	≤20
3	COD (Chemical Oxygen Demand)	mg/L	Close Reflux, Titrimetric	-	27	≤120 ¹²⁾
4	SS (Suspended Solids)	mg/L	Dried at 103-105°C	58.52	<2.5	≤30
5	Settleable Solids	ml/L	Volumetric	-	<0.1	≤0.5
6	TDS (Total Dissolve Solids)	mg/L	Dried at 180°C	-	390	≤500
7	Sulfide	mg/L	Methylene Blue, Titrimetric	87.15	<0.01	≤1
8	TKN (Total Kjeldahl Nitrogen)	mg/L	Macro-Kjeldahl, Titrimetric	10.9	4.76	≤35
9	Oil & Grease	mg/L	Partition-Gravimetric	-	1.0	≤20
10	Total Coliform Bacteria	MPN/100ml	Multiple Tube Fermentation Technique	>1.6x10 ⁵	2.0x10 ²	≤5,000 ¹³⁾
11	Fecal Coliform Bacteria	MPN/100ml	Multiple Tube Fermentation Technique	-	58	≤1,000 ¹³⁾
12	Residual Free Chlorine	mg/L	DPD Ferrous Titrimetric	-	<0.01	≤1.0 ¹²⁾

Method : Based on Standard Method for the Examination of Water and Wastewater, APHA, 2000, 22nd Edition 2017

Standard : ¹⁴⁾ Notification of the Ministry of Natural Resources and Environment Building (B.E. 2548)

¹²⁾ Notification of the Ministry of Natural Resources and Environment (B.E. 2559)

¹³⁾ Notification of the National Environment Board No. 8 (B.E. 2537)

Remark : TDS in the effluent increase from TDS in water supply (TDS in water supply = 150 mg/L)

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Analysis Report

Customer Name : Bangkok Hospital/HuaHin
 Address : 888 Petchkasem Rd., HuaHin, Prachuapkhirikhan 77110
 Type of Sampling : Wastewater
 Sampling date : October 4, 2023.
 Sampling by : SES

Item	Description	Unit	Method	Result		Standard ³
				ตามปกติทั่วไป		
				น้ำเข้าระบบ (Influent) ⁴	น้ำที่ออกจากระบบ (Effluent)	
	Sample condition	-	-	yellow turbid slight sediment foul smell	light yellow	-
1	pH	-	Electrometric	6.55	6.79	5.0-9.0
2	BOD (Biochemical Oxygen Demand)	mg/L	5 Days BOD Test	85	5	≤20
3	COD (Chemical Oxygen Demand)	mg/L	Close Reflux, Titrimetric	-	39	≤120 ¹²⁾
4	SS (Suspended Solids)	mg/L	Dried at 103-105°C	60.46	<2.5	≤30
5	Settleable Solids	ml/L	Volumetric	-	<0.1	≤0.5
6	TDS (Total Dissolve Solids)	mg/L	Dried at 180°C	-	220	≤500
7	Sulfide	mg/L	Methylene Blue, Titrimetric	2.81	<0.01	≤1
8	TKN (Total Kjeldahl Nitrogen)	mg/L	Macro-Kjeldahl, Titrimetric	91.62	7.06	≤35
9	Oil & Grease	mg/L	Partition-Gravimetric	7.4	0.9	≤20
10	Total Coliform Bacteria	MPN/100ml	Multiple Tube Fermentation Technique	>1.6x10 ⁵	540	≤5,000 ¹³⁾
11	Fecal Coliform Bacteria	MPN/100ml	Multiple Tube Fermentation Technique	-	120	≤1,000 ¹³⁾
12	Residual Free Chlorine	mg/L	DPD Ferrous Titrimetric	-	<0.01	≤1.0 ¹²⁾

Method : Based on Standard Method for the Examination of Water and Wastewater, APHA, AWWA, WEF 23rd Edition 2017

Standard : ¹⁴⁾ Notification of the Ministry of Natural Resources and Environment Building (B.E. 2548)

¹²⁾ Notification of the Ministry of Natural Resources and Environment (B.E. 2559)

¹³⁾ Notification of the National Environment Board No. 8 (B.E. 2537)

Remark : TDS in the effluent increase from TDS in water supply (TDS in water supply = 130 mg/L)

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Analysis Report

Customer Name : Bangkok Hospital/HuaHin
 Address : 888 Petchkasem Rd., HuaHin, Prachuapkhirikhan 77110
 Type of Sampling : Wastewater
 Sampling date : November 1, 2023.
 Sampling by : SES

Item	Description	Unit	Method	Result		Standard ³
				ตามปกติทั่วไป		
				น้ำเข้า/น้ำดิบ (Influent) ⁴	น้ำที่ปล่อยจากกระบวนการ (Effluent)	
	Sample condition	-	-	yellow turbid brown sediment foul smell	yellow turbid brown sediment	-
1	pH	-	Electrometric	6.68	6.39	5.0-9.0
2	BOD (Biochemical Oxygen Demand)	mg/L	5 Days BOD Test	96	15	≤20
3	COD (Chemical Oxygen Demand)	mg/L	Close Reflux, Titrimetric	-	112	≤120 ¹²⁾
4	SS (Suspended Solids)	mg/L	Dried at 103-105 °C	72.14	41.73	≤30
5	Settleable Solids	ml/L	Volumetric	-	<0.1	≤0.5
6	TDS (Total Dissolve Solids)	mg/L	Dried at 180 °C	-	140	≤500
7	Sulfide	mg/L	Methylene Blue, Titrimetric	2.95	<0.01	≤1
8	TKN (Total Kjeldahl Nitrogen)	mg/L	Macro-Kjeldahl, Titrimetric	136.84	5.61	≤35
9	Oil & Grease	mg/L	Partition-Gravimetric	10.5	3.3	≤20
10	Total Coliform Bacteria	MPN/100ml	Multiple Tube Fermentation Technique	>1.6x10 ⁵	2.6x10 ⁵	≤5,000 ¹³⁾
11	Fecal Coliform Bacteria	MPN/100ml	Multiple Tube Fermentation Technique	-	5.6x10 ²	≤1,000 ¹³⁾
12	Residual Free Chlorine	mg/L	DPD Ferrous Titrimetric	-	<0.01	≤1.0 ¹²⁾

Method : Based on Standard Method for the Examination of Water and Wastewater, APHA, 2000, 22nd Edition 2017

Standard : ¹⁴⁾ Notification of the Ministry of Natural Resources and Environment Building (B.E. 2548)

¹²⁾ Notification of the Ministry of Natural Resources and Environment (B.E. 2559)

¹³⁾ Notification of the National Environment Board No. 8 (B.E. 2537)

Remark : TDS in the effluent increase from TDS in water supply (TDS in water supply = 140 mg/L)

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Analysis Report

Customer Name : Bangkok Hospital/HuaHin
 Address : 888 Petchkasem Rd., HuaHin, Prachuapkhirikhan 77110
 Type of Sampling : Wastewater
 Sampling date : December 1, 2023.
 Sampling by : SES

Item	Description	Unit	Method	Result		Standard ³
				ตามปกติทั่วไป		
				น้ำเข้า/น้ำดิบ (Influent)*	น้ำที่ปล่อยจากระบบ (Effluent)	
	Sample condition	-	-	yellow turbid slight sediment foul smell	light yellow	-
1	pH	-	Electrometric	6.47	6.83	5.0-9.0
2	BOD (Biochemical Oxygen Demand)	mg/L	5 Days BOD Test	104	9	≤20
3	COD (Chemical Oxygen Demand)	mg/L	Close Reflux, Titrimetric	-	73	≤120 ¹²⁾
4	SS (Suspended Solids)	mg/L	Dried at 103-105°C	43.96	<2.5	≤30
5	Settleable Solids	ml/L	Volumetric	-	<0.1	≤0.5
6	TDS (Total Dissolve Solids)	mg/L	Dried at 180°C	-	270	≤500
7	Sulfide	mg/L	Methylene Blue, Titrimetric	2.47	<0.01	≤1
8	TKN (Total Kjeldahl Nitrogen)	mg/L	Macro-Kjeldahl, Titrimetric	156.13	2.79	≤35
9	Oil & Grease	mg/L	Partition-Gravimetric	13.4	2.8	≤20
10	Total Coliform Bacteria	MPN/100ml	Multiple Tube Fermentation Technique	>1.6x10 ⁵	350	≤5,000 ¹³⁾
11	Fecal Coliform Bacteria	MPN/100ml	Multiple Tube Fermentation Technique	-	<1.8	≤1,000 ¹³⁾
12	Residual Free Chlorine	mg/L	DPD Ferrous Titrimetric	-	<0.01	≤1.0 ¹²⁾

Method : Based on Standard Method for the Examination of Water and Wastewater, APHA, AWWA, WEF 23rd Edition 2017

Standard : ¹⁴⁾ Notification of the Ministry of Natural Resources and Environment Building (B.E. 2548)

¹²⁾ Notification of the Ministry of Natural Resources and Environment (B.E. 2559)

¹³⁾ Notification of the National Environment Board No. 8 (B.E. 2537)

Remark : TDS in the effluent increase from TDS in water supply (TDS in water supply = 120 mg/L)

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SES-23142/WS

August 15, 2023.

Analysis Report

Customer Name : Bangkok Hospital/Hua Hin
Address : 888 Petchkasem Rd., Hua Hin, Prachuapkhirikhan 77110
Type of Sampling : Water Supply
Sampling date : August 2, 2023.
Sampling by : SES

Item	Description	Unit	Method	Result	
				Cooling Tower	
				อ่างรองรับน้ำ (น้ำเข้า)	อ่างน้ำทิ้งจากหอผึ่งเย็น (น้ำออก)
	Sample condition	-	-	clear	yellow
1	Legionella pneumophila	CFU/1000 ml.	Direct Count	ไม่พบ	ไม่พบ

Method : Based on Standard Method for the Examination of Water and Wastewater, APHA, AWWA, WEF 23rd Edition 2017
Standard : ประกาศกรมอนามัย เรื่อง ข้อปฏิบัติการควบคุมเชื้อสัลโมเนลลาในหอผึ่งเย็นของอาคารในประเทศไทย พ.ศ.2544

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SES-23202/WS

November 14, 2023.

Analysis Report

Customer Name : Bangkok Hospital/HuaHin
Address : 888 Petchkasem Rd., HuaHin, Prachuapkhirikhan 77110
Type of Sampling : Cooling Tower
Sampling date : November 1, 2023.
Sampling by : SES

Item	Description	Unit	Method	Result	
				Cooling Tower	
				ค่าความขุ่น (น้ำสี)	ค่าสีที่ตรวจพบเป็น (น้ำยา)
	Sample condition	-	-	clear	light yellow
1	Legionella pneumophila	CFU/1000 ml.	Direct Count	Non-Detectable	Non-Detectable

Method : Based on Standard Method for the Examination of Water and Wastewater, APHA, AWWA, WEF 23rd Edition 2017

Standard : ประกาศกระทรวงมหาดไทย เรื่อง วิธีการพิจารณาคุณภาพของน้ำในประเทศไทย พ.ศ. 2544

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