



## ANALYSIS REPORT

**CUSTOMER NAME** : TPI POLENE PUBLIC COMPANY LIMITED

**ADDRESS** : 299 MOO 5 MITRAPARP ROAD MITTRAPHAP TABKWANG KAENGKOEI SARABURI 18260

**CONTACT INFORMATION** : TEL : [REDACTED] e-mail : [REDACTED]

**SAMPLING SOURCE** : POWER PLANT AREA

**SAMPLE TYPE** : SURFACE WATER

**SAMPLING DATE** : AUGUST 23, 2022

**SAMPLING TIME** : 09:30 HOUR

**SAMPLING METHOD** : GRAB

**SAMPLING BY** : MR MANIT PANCHOT

**ANALYZED BY** : MISS PORNPIMOL WAENTHONG

**RECEIVED DATE** : AUGUST 23, 2022

**ANALYTICAL DATE** : AUGUST 23 - SEPTEMBER 1, 2022

**REPORT NO.** : [REDACTED]

**WORK NO.** : [REDACTED]

**ANALYSIS NO.** : [REDACTED]

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			SURFACE WATER T22AQ528-0001		
pH <sup>a</sup>	-	ELECTROMETRIC METHOD AT SITE (SM:4500-H <sup>+</sup> B)	8.1 (30°C)	5.0-9.0	-
TEMPERATURE <sup>c</sup>	°C	THERMOMETER AT SITE (SM: 2550 B)	30	n'	-
ELECTRICAL CONDUCTIVITY <sup>c</sup>	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2510 B)	828 (30°C)	-	0.1
ODOUR <sup>c</sup>	-	OBSERVATION METHOD	NONE	n	-
DISSOLVED OXYGEN <sup>c</sup>	mg/L	AZIDE MODIFICATION METHOD AT SITE (SM: 4500-O C)	4.4	≥ 2.0	0.5
COLOUR <sup>c</sup>	Pt-Co	VISUAL COMPARISON METHOD (SM: 2120 B)	10	n	5
BIOCHEMICAL OXYGEN DEMAND <sup>c</sup>	mg/L	AZIDE MODIFICATION METHOD (SM: 4500-O C AND 5210 B)	2.0	≤ 4.0	1.0
CHEMICAL OXYGEN DEMAND <sup>c</sup>	mg/L	CLOSED REFLUX, COLOURIMETRIC METHOD (SM: 5220 D)	ND	-	25.0
TOTAL SUSPENDED SOLIDS <sup>a</sup>	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: 2540 D)	11.3	-	5.0
TOTAL DISSOLVED SOLIDS <sup>b</sup>	mg/L	TOTAL DISSOLVED SOLIDS DRIED AT 180 °C (SM: 2540 C)	420	-	25
PHENOLS <sup>c</sup>	mg/L	DISTILLATION, 4-AMINOANTIPYRINE METHOD (SM: 5530 B AND 5530 C)	ND	≤ 0.005	0.005
TOTAL KJELDAHL NITROGEN <sup>c</sup>	mg/L	IN-HOUSE METHOD: UAE.TP.WAS.001 (KJELDAHL METHOD); SM: 4500-Norg C	< LOQ	-	1.5
CYANIDE AS HCN <sup>c</sup>	mg/L HCN	DISTILLATION, PYRIDINE-BARBITURIC ACID METHOD (SM: 4500-CN <sup>-</sup> C AND 4500 -CN <sup>-</sup> E)	ND	-	0.001
FAT, OIL AND GREASE <sup>c</sup>	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: 5520 B)	ND	-	3
HYDROGEN SULPHIDE <sup>c</sup>	mg/L H <sub>2</sub> S	METHYLENE BLUE METHOD(SM: 4500-S <sup>2-</sup> D)	ND	-	0.02
TOTAL HARDNESS <sup>a</sup>	mg/L as CaCO <sub>3</sub>	EDTA TITRIMETRIC METHOD (SM: 2340 C)	180	-	4.0
FORMALDEHYDE <sup>c</sup>	mg/L	DISTILLATION AND COLOURIMETRIC METHOD	ND	-	0.05
PHOSPHATE <sup>c</sup>	mg/L PO <sub>4</sub> <sup>3-</sup>	ASCORBIC ACID METHOD (SM: 4500-P E)	0.09	-	0.03
FREE CHLORINE <sup>c</sup>	mg/L Cl <sub>2</sub>	DPD FERROUS TITRIMETRIC METHOD (SM: 4500-CI F)	ND	-	0.1
RESIDUAL CHLORINE <sup>c</sup>	mg/L Cl <sub>2</sub>	DPD FERROUS TITRIMETRIC METHOD (SM: 4500-CI F)	ND	-	0.1





PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			SURFACE WATER T22AQ528-0001		
METALS					
ARSENIC <sup>°</sup>	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	0.0015	≤ 0.01	0.0003
HEXAVALENT CHROMIUM <sup>°</sup>	mg/L Cr <sup>6+</sup>	EXTRACTION AND AIR-ACETYLENE FLAME METHOD (SM: 3111 C)	ND	≤ 0.05	0.001
MERCURY <sup>°</sup>	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: 3112 B	ND	≤ 0.002	0.0001
CADMIUM <sup>°</sup>	mg/L Cd	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.005*, ≤ 0.05**	0.002
COPPER <sup>°</sup>	mg/L Cu	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.1	0.002
LEAD <sup>°</sup>	mg/L Pb	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.05	0.003
MANGANESE <sup>°</sup>	mg/L Mn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	< LOQ	≤ 1.0	0.002
NICKEL <sup>°</sup>	mg/L Ni	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.1	0.005
ZINC <sup>°</sup>	mg/L Zn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	< LOQ	≤ 1.0	0.003
BARIUM <sup>°</sup>	mg/L Ba	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	0.046	-	0.003
TRIVALENT CHROMIUM <sup>°</sup>	mg/L Cr <sup>3+</sup>	NITRIC ACID DIGESTION, DIRECT AIR ACETYLENE FLAME, COLOURIMETRIC (SM: 3030 E, 3111 B AND 3500-Cr B) AND CALCULATION METHOD	ND	-	0.005



PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			SURFACE WATER T22AQ528-0001		
SELENIUM <sup>c</sup>	mg/L Se	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	ND	-	0.0005
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR BROWN		

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITEDIN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

REGULATORY STANDARD : SURFACE WATER QUALITY STANDARDS CLASS 4, NOTIFICATION OF THE NATIONAL ENVIRONMENT BOARD, NO.8, B.E. 2537 ISSUED UNDER THE ENCHANCEMENT AND CONSERVATION OF NATIONAL ENVIRONMENTAL QUALITY ACT, B.E. 2535, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL. 111, PART 16, DATED FEBRUARY 24, B.E. 2537 (1994).

CLASS 4 : MEDIUM CLEAN FRESH SURFACE WATER RESOURCES USED FOR  
(1) CONSUMPTION, BUT PASSING THROUGH AN ORDINARY TREATMENT PROCESS BEFORE USING  
(2) INDUSTRY

n : NATURALLY

n' : THE TEMPERATURE OF THE WATER MUST NOT BE HIGHER THAN THE NATURAL TEMPERATURE EXCEEDING 3 DEGREES CELSIUS

≤ 0.005\* : WHEN WATER HARDNESS NOT MORE THAN 100 mg/L AS CaCO<sub>3</sub>≤ 0.05\*\* : WHEN WATER HARDNESS MORE THAN 100 mg/L AS CaCO<sub>3</sub>

ND : NON-DETECTABLE.

&lt; LOQ : &lt; LIMIT OF QUANTITATION (TOTAL KJELDAHL NITROGEN ≥ 1.5 AND &lt; 5.0 mg/L, MANGANESE ≥ 0.002 AND &lt; 0.025 mg/L, ZINC ≥ 0.003 AND &lt; 0.025 mg/L).

(MISS BENJAWAN VIRIYOTHAI)  
LABORATORY SUPERVISOR

SEPTEMBER 12, 2022





## United Analyst and Engineering Consultant Co., Ltd.

3 Soi Udomsuk 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

**CUSTOMER NAME** : TPI POLENE PUBLIC COMPANY LIMITED

**ADDRESS** : 299 MOO 5 MITRAPARP ROAD MITTRAPHAP TABKWANG KAENGKOEI SARABURI 18260

**CONTACT INFORMATION** : TEL : [REDACTED] e-mail : [REDACTED]

**SAMPLING SOURCE** : POWER PLANT AREA

**SAMPLE TYPE** : SURFACE WATER

**SAMPLING DATE** : AUGUST 23, 2022

**SAMPLING TIME** : 09:30 HOUR

**SAMPLING METHOD** : GRAB

**SAMPLING BY** : MR MANIT PANCHOT

**ANALYZED BY** : MISS WORAKON PADSONGCHAN

**RECEIVED DATE** : AUGUST 23, 2022

**ANALYTICAL DATE** : AUGUST 23 - SEPTEMBER 2, 2022

**REPORT NO.** : [REDACTED]

**WORK NO.** : [REDACTED]

**ANALYSIS NO.** : [REDACTED]

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			SURFACE WATER T22AQ528-0001		
ORGANOCHLORINE PESTICIDES					
α-BHC	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	≤ 0.02	0.02
β-BHC	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	-	0.02
γ-BHC	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	-	0.02
δ-BHC	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	-	0.02
ALDRIN	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	≤ 0.1	0.02
DIELDRIN	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	≤ 0.1	0.02
ENDOSULFAN I	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	-	0.02
ENDOSULFAN II	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	-	0.04
ENDOSULFAN SULFATE	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	-	0.04
ENDRIN	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.04
ENDRIN ALDEHYDE	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	-	0.04
HEPTACHLOR	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	1/	0.02
HEPTACHLOR EPOXIDE	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	1/	0.02





PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			SURFACE WATER T22AQ528-0001		
p,p-DDD	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	-	0.04
p,p-DDE	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	-	0.04
p,p-DDT	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	-	0.04
METHOXYCHLOR	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	-	0.20
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR BROWN		

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

REGULATORY STANDARD : SURFACE WATER QUALITY STANDARDS CLASS 4, NOTIFICATION OF THE NATIONAL ENVIRONMENT BOARD, NO.8,  
B.E. 2537 ISSUED UNDER THE ENCHANCEMENT AND CONSERVATION OF NATIONAL ENVIRONMENTAL QUALITY  
ACT, B.E. 2535, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL. 111, PART 16, DATED FEBRUARY 24,  
B.E. 2537 (1994).

CLASS 4 : MEDIUM CLEAN FRESH SURFACE WATER RESOURCES USED FOR  
(1) CONSUMPTION, BUT PASSING THROUGH AN ORDINARY TREATMENT PROCESS BEFORE USING  
(2) INDUSTRY

1/ : TOTAL OF HEPTACHLOR AND HEPTACHLOR EPOXIDE FOLLOWS THE STANDARD IS LESS THAN 0.2 µg/L.

ND : NON-DETECTABLE.



(MISS BENJAWAN VIRIYOTHA)

LABORATORY SUPERVISOR

SEPTEMBER 12, 2022



United Analyst and Engineering Consultant Co., Ltd.

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

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

TESTING  
No.0063**ANALYSIS REPORT****CUSTOMER NAME** : TPI POLENE PUBLIC COMPANY LIMITED**ADDRESS** : 299 MOO 5 MITRAPARP ROAD MITTRAPHAP TABKWANG KAENGKOI SARABURI 18260**CONTACT INFORMATION** : TEL : [REDACTED] e-mail : [REDACTED]**SAMPLING SOURCE** : POWER PLANT AREA**SAMPLE TYPE** : SURFACE WATER**SAMPLING DATE** : AUGUST 23, 2022**SAMPLING TIME** : 09:30 HOUR**SAMPLING METHOD °** : GRAB, GRAB AND STERILE TECHNIQUE**SAMPLING BY °** : MR MANIT PANCHOT**ANALYZED BY** : MISS ITSARIYAPORN BUATIB**RECEIVED DATE** : AUGUST 23, 2022**ANALYTICAL DATE** : AUGUST 23-30, 2022**REPORT NO.** : [REDACTED]**WORK NO.** : [REDACTED]**ANALYSIS NO.** : [REDACTED]

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			SURFACE WATER T22AQ528-0002		
TURBIDITY °	NTU	NEPHELOMETRIC METHOD (SM: 2130 B)	21	-	0.1
SALINITY °	ppt	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2520 B)	0.4	-	0.1
SODIUM ADSORPTION RATIO °	-	INDUCTIVELY COUPLED PLASMA (ICP) AND CALCULATION METHOD	1.37	-	-
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: 4500-SO <sub>4</sub> <sup>2-</sup> E)	92.7	-	0.3
NITRATE-NITROGEN °	mg/L NO <sub>3</sub> <sup>-</sup> -N	CADMIUM REDUCTION METHOD (SM: 4500 -NO <sub>3</sub> <sup>-</sup> E)	0.78	≤ 5.0	0.02
<b>METALS</b>					
IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	0.228	-	0.005
TITANIUM °	mg/L Ti	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	ND	-	0.005







PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			SURFACE WATER T22AQ528-0002		
MICROBIOLOGY					
COLIFORM BACTERIA <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: 9221 B)	490	-	1.8
FAECAL COLIFORM BACTERIA <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: 9221 E)	49	-	1.8
SAMPLE CONDITION					
WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR  BROWN		

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITEDIN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.REGULATORY STANDARD : SURFACE WATER QUALITY STANDARDS CLASS 4, NOTIFICATION OF THE NATIONAL ENVIRONMENT BOARD, NO.8,  
B.E. 2537 ISSUED UNDER THE ENHANCEMENT AND CONSERVATION OF NATIONAL ENVIRONMENTAL QUALITY  
ACT, B.E. 2535, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL. 111, PART 16, DATED FEBRUARY 24,  
B.E. 2537 (1994).CLASS 4 : MEDIUM CLEAN FRESH SURFACE WATER RESOURCES USED FOR  
(1) CONSUMPTION, BUT PASSING THROUGH AN ORDINARY TREATMENT PROCESS BEFORE USING  
(2) INDUSTRY

ND : NON-DETECTABLE.

(MISS BENJAWAN VIRIYOTHAI)  
LABORATORY SUPERVISOR

SEPTEMBER 12, 2022



## United Analyst and Engineering Consultant Co., Ltd.

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

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

NSC - TISI - TIS 17025  
TESTING 0207LABORATORY ACCREDITATION  
BLA-DSS  
TESTING  
No. 0063

## ANALYSIS REPORT

**CUSTOMER NAME** : TPI POLENE PUBLIC COMPANY LIMITED

**ADDRESS** : 299 MOO 5 MITRAPARP ROAD MITTRAPHAP TABKWANG KAENGKOI SARABURI 18260

**CONTACT INFORMATION** : TEL : [REDACTED] e-mail : [REDACTED]

**SAMPLING SOURCE** : ห้วยชันบน (บริเวณวัดชันบน)

**SAMPLE TYPE** : SURFACE WATER

**SAMPLING DATE** : AUGUST 23, 2022

**SAMPLING TIME** : 13:40 HOUR

**SAMPLING METHOD** : GRAB

**SAMPLING BY** : MR MANIT PANCHOT

**ANALYZED BY** : MISS PORNPIMOL WAENTHONG

**RECEIVED DATE** : AUGUST 23, 2022

**ANALYTICAL DATE** : AUGUST 23 - SEPTEMBER 1, 2022

**REPORT NO.** : [REDACTED]

**WORK NO.** : [REDACTED]

**ANALYSIS NO.** : [REDACTED]

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			SURFACE WATER T22AQ528-0003		
pH <sup>a</sup>	-	ELECTROMETRIC METHOD AT SITE (SM:4500-H <sup>+</sup> B)	8.2 (30°C)	5.0-9.0	-
TEMPERATURE <sup>c</sup>	°C	THERMOMETER AT SITE (SM: 2550 B)	30	n'	-
ELECTRICAL CONDUCTIVITY <sup>c</sup>	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2510 B)	959 (30°C)	-	0.1
DISSOLVED OXYGEN <sup>c</sup>	mg/L	AZIDE MODIFICATION METHOD AT SITE (SM: 4500-O C)	5.5	≥ 4.0	0.5
BIOCHEMICAL OXYGEN DEMAND <sup>c</sup>	mg/L	AZIDE MODIFICATION METHOD (SM: 4500-O C AND 5210 B)	1.7	≤ 2.0	1.0
CHEMICAL OXYGEN DEMAND <sup>c</sup>	mg/L	CLOSED REFLUX, COLOURIMETRIC METHOD (SM: 5220 D)	ND	-	25.0
TOTAL SUSPENDED SOLIDS <sup>a</sup>	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: 2540 D)	26.6	-	5.0
TOTAL DISSOLVED SOLIDS <sup>b</sup>	mg/L	TOTAL DISSOLVED SOLIDS DRIED AT 180 °C (SM: 2540 C)	498	-	25
PHOSPHATE <sup>c</sup>	mg/L PO <sub>4</sub> <sup>3-</sup>	ASCORBIC ACID METHOD (SM: 4500-P E)	0.12	-	0.03







PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			SURFACE WATER T22AQ528-0003		
RESIDUAL CHLORINE <sup>c</sup>	mg/L Cl <sub>2</sub>	DPD FERROUS TITRIMETRIC METHOD (SM: 4500-Cl F)	ND	-	0.1
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR YELLOW		

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITEDSM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

REGULATORY STANDARD : SURFACE WATER QUALITY STANDARDS CLASS 3, NOTIFICATION OF THE NATIONAL ENVIRONMENT BOARD, NO.8, B.E. 2537 ISSUED UNDER THE ENCHANCEMENT AND CONSERVATION OF NATIONAL ENVIRONMENTAL QUALITY ACT, B.E. 2535, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL. 111, PART 16, DATED FEBRUARY 24, B.E. 2537 (1994).

CLASS 3 : MEDIUM CLEAN FRESH SURFACE WATER RESOURCES USED FOR  
(1) CONSUMPTION, BUT PASSING THROUGH AN ORDINARY TREATMENT PROCESS BEFORE USING  
(2) AGRICULTURE

n' : THE TEMPERATURE OF THE WATER MUST NOT BE HIGHER THAN THE NATURAL TEMPERATURE EXCEEDING 3 DEGREES CELSIUS

ND : NON-DETECTABLE.

  
(MISS BENJAWAN VIRIYOTHA)
   
LABORATORY SUPERVISOR

SEPTEMBER 12, 2022



## United Analyst and Engineering Consultant Co., Ltd.

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

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

NSC-TISI-TIS 17025  
TESTING 0207TESTING  
No. 0063

## ANALYSIS REPORT

**CUSTOMER NAME** : TPI POLENE PUBLIC COMPANY LIMITED  
**ADDRESS** : 299 MOO 5 MITRAPARP ROAD MITTRAPHAP TABKWANG KAENGKOI SARABURI 18260  
**CONTACT INFORMATION** : TEL : [REDACTED] e-mail : [REDACTED]  
**SAMPLING SOURCE** : ห้วยขี้บ่อน (บริเวณวัดขี้บ่อน)  
**SAMPLE TYPE** : SURFACE WATER  
**SAMPLING DATE** : AUGUST 23, 2022  
**SAMPLING TIME** : 13:40 HOUR  
**SAMPLING METHOD °** : GRAB, GRAB AND STERILE TECHNIQUE  
**SAMPLING BY °** : MR MANIT PANCHOT  
**ANALYZED BY** : MISS NADNAPA KAMOLBOON

**RECEIVED DATE** : AUGUST 23, 2022  
**ANALYTICAL DATE** : AUGUST 23-30, 2022  
**REPORT NO.** : [REDACTED]  
**WORK NO.** : [REDACTED]  
**ANALYSIS NO.** : [REDACTED]

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			SURFACE WATER T22AQ528-0004		
SALINITY °	ppt	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2520 B)	0.4	-	0.1
TURBIDITY °	NTU	NEPHELOMETRIC METHOD (SM: 2130 B)	30	-	0.1
FAT, OIL AND GREASE °	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: 5520 B)	ND	-	3
TOTAL HARDNESS °	mg/L as CaCO <sub>3</sub>	EDTA TITRIMETRIC METHOD (SM: 2340 C)	253	-	4.0
NITRATE-NITROGEN °	mg/L NO <sub>3</sub> -N	CADMIUM REDUCTION METHOD (SM: 4500 -NO <sub>3</sub> - E)	0.37	≤ 5.0	0.02
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: 4500-SO <sub>4</sub> <sup>2-</sup> E)	92.2	-	0.3
SODIUM ADSORPTION RATIO °	-	INDUCTIVELY COUPLED PLASMA (ICP) AND CALCULATION METHOD	1.14	-	-
METALS					
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	0.0018	≤ 0.01	0.0003
BARIUM °	mg/L Ba	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	0.065	-	0.003
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.005*, ≤ 0.05**	0.002
HEXAVALENT CHROMIUM °	mg/L Cr <sup>6+</sup>	EXTRACTION AND AIR-ACETYLENE FLAME METHOD (SM: 3111 C)	ND	≤ 0.05	0.001
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	< LOQ	≤ 0.1	0.002
IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	0.730	-	0.005
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.05	0.003





PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			SURFACE WATER T22AQ528-0004		
MANGANESE <sup>c</sup>	mg/L Mn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	0.091	≤ 1.0	0.002
MERCURY <sup>b</sup>	mg/L Hg	IN-HOUSE METHOD: UAE.TP.HEM.002 (COLD VAPOUR ATOMIC ABSORPTION SPECTROMETRIC METHOD); SM: 3112 B	ND	≤ 0.002	0.0001
NICKEL <sup>c</sup>	mg/L Ni	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.1	0.005
SELENIUM <sup>c</sup>	mg/L Se	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	ND	-	0.0005
TITANIUM <sup>c</sup>	mg/L Ti	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	0.007	-	0.005
ZINC <sup>c</sup>	mg/L Zn	IN-HOUSE METHOD: UAE.TP.SW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	< LOQ	≤ 1.0	0.003





PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			SURFACE WATER T22AQ528-0004		
MICROBIOLOGY					
COLIFORM BACTERIA <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: 9221B)	46	≤ 20,000	1.8
FAECAL COLIFORM BACTERIA <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: 9221E)	2.0	≤ 4,000	1.8
SAMPLE CONDITION WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR  BROWN		

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITEDIN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.REGULATORY STANDARD : SURFACE WATER QUALITY STANDARDS CLASS 3, NOTIFICATION OF THE NATIONAL ENVIRONMENT BOARD, NO.8,  
B.E. 2537 ISSUED UNDER THE ENHANCEMENT AND CONSERVATION OF NATIONAL ENVIRONMENTAL QUALITY  
ACT, B.E. 2535, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL. 111, PART 16, DATED FEBRUARY 24,  
B.E. 2537 (1994).CLASS 3 : MEDIUM CLEAN FRESH SURFACE WATER RESOURCES USED FOR  
(1) CONSUMPTION, BUT PASSING THROUGH AN ORDINARY TREATMENT PROCESS BEFORE USING  
(2) AGRICULTURE≤0.005\* : WHEN WATER HARDNESS NOT MORE THAN 100 mg/L AS CaCO<sub>3</sub>≤0.05\*\* : WHEN WATER HARDNESS MORE THAN 100 mg/L AS CaCO<sub>3</sub>

ND : NON-DETECTABLE.

&lt; LOQ : &lt; LIMIT OF QUANTITATION (COPPER ≥ 0.002 AND &lt; 0.025 mg/L, ZINC ≥ 0.003 AND &lt; 0.025 mg/L).

(MISS BENJAWAN VIRIYOTHAJ)  
LABORATORY SUPERVISOR

SEPTEMBER 12, 2022



## ANALYSIS REPORT

**CUSTOMER NAME** : TPI POLENE PUBLIC COMPANY LIMITED

**ADDRESS** : 299 MOO 5 MITRAPARP ROAD MITTRAPHAP TABKWANG KAENGKOI SARABURI 18260

**CONTACT INFORMATION** : TEL : [REDACTED] e-mail : [REDACTED]

**SAMPLING SOURCE** : TRIANGULAR POND AREA

**SAMPLE TYPE** : EFFLUENT

**SAMPLING DATE** : JULY 15, 2022

**SAMPLING TIME** : 09:35 HOUR

**SAMPLING METHOD** : GRAB, GRAB AND STERILE TECHNIQUE

**SAMPLING BY** : MR MANIT PANCHOT

**ANALYZED BY** : MISS AMONRAT PUTTALEE

**RECEIVED DATE** : JULY 15, 2022

**ANALYTICAL DATE** : JULY 15-25, 2022

**REPORT NO.** : [REDACTED]

**WORK NO.** : [REDACTED]

**ANALYSIS NO.** : [REDACTED]

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			EFFLUENT T22A0074-0001		
pH <sup>a</sup>	-	ELECTROMETRIC METHOD AT SITE (SM:4500-H <sup>+</sup> B)	8.7 (29°C)	5.5-9.0	-
TEMPERATURE <sup>c</sup>	°C	THERMOMETER AT SITE (SM: 2550 B)	29	≤ 40	-
ELECTRICAL CONDUCTIVITY <sup>c</sup>	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2510 B)	1,179 (29°C)	-	0.1
DISSOLVED OXYGEN <sup>c</sup>	mg/L	MEMBRANE ELECTRODE METHOD AT SITE (SM: 4500-O G)	3.4	-	0.5
SALINITY <sup>c</sup>	ppt	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2520 B)	0.5	-	0.1
TURBIDITY <sup>c</sup>	NTU	NEPHELOMETRIC METHOD (SM: 2130 B)	4.1	-	0.1
BIOCHEMICAL OXYGEN DEMAND <sup>a</sup>	mg/L	MEMBRANE ELECTRODE METHOD (SM: 4500-O G AND 5210 B)	ND	≤ 20	2.0
CHEMICAL OXYGEN DEMAND <sup>a</sup>	mg/L	CLOSED REFLUX, COLOURIMETRIC METHOD (SM: 5220 D)	ND	≤ 120	25.0
TOTAL SUSPENDED SOLIDS <sup>a</sup>	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: 2540 D)	ND	≤ 50	5.0
TOTAL DISSOLVED SOLIDS <sup>b</sup>	mg/L	TOTAL DISSOLVED SOLIDS DRIED AT 180 °C (SM: 2540 C)	590	≤ 3,000	25
TOTAL HARDNESS <sup>c</sup>	mg/L as CaCO <sub>3</sub>	EDTA TITRIMETRIC METHOD (SM: 2340 C)	244	-	4.0
NITRATE-NITROGEN <sup>c</sup>	mg/L NO <sub>3</sub> <sup>-</sup> -N	CADMIUM REDUCTION METHOD (SM: 4500 -NO <sub>3</sub> <sup>-</sup> E)	0.48	-	0.02
PHOSPHATE <sup>c</sup>	mg/L PO <sub>4</sub> <sup>3-</sup>	ASCORBIC ACID METHOD (SM: 4500-P E)	1.44	-	0.03
RESIDUAL CHLORINE <sup>c</sup>	mg/L Cl <sub>2</sub>	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	ND	-	0.1
SULPHATE <sup>c</sup>	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: 4500-SO <sub>4</sub> <sup>2-</sup> E)	81.4	-	0.3
FAT, OIL AND GREASE <sup>a</sup>	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: 5520 B)	ND	≤ 5	3
SODIUM ADSORPTION RATIO <sup>c</sup>	-	INDUCTIVELY COUPLED PLASMA (ICP) AND CALCULATION METHOD	2.03	-	-





PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			EFFLUENT T22A0074-0001		
METALS					
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	0.0017	≤ 0.25	0.0003
BARIUM °	mg/L Ba	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	0.106	≤ 1.0	0.005
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.03	0.002
HEXAVALENT CHROMIUM °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: 3500-Cr B)	ND	≤ 0.25	0.006
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 2.0	0.005
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.2	0.015
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 5.0	0.004
MERCURY °	mg/L Hg	COLD VAPOUR AAS METHOD (SM: 3112 B)	ND	≤ 0.005	0.0005
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 1.0	0.005
SELENIUM °	mg/L Se	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	ND	≤ 0.02	0.0005
TITANIUM °	mg/L Ti	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	ND	-	0.010
TOTAL IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	0.114	-	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 5.0	0.003





## United Analyst and Engineering Consultant Co., Ltd.

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

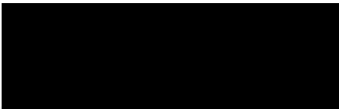
Tel. 0 2763 2828 Fax 0 2763 2800 www.uaeconsultant.com E-mail: uae@uaeconsultant.com

NSC-TISI-TIS 17025  
TESTING 0207TESTING  
No. 0063

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			EFFLUENT T22A0074-0001		
MICROBIOLOGY					
FAECAL COLIFORM BACTERIA <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: 9221 E)	3,300	-	1.8
COLIFORM BACTERIA <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: 9221 B)	4,900	-	1.8
SAMPLE CONDITION WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR  BROWN		

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITEDIN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.REGULATORY STANDARD : INDUSTRIAL EFFLUENT STANDARDS, NOTIFICATION OF THE MINISTRY OF INDUSTRY, B.E. 2560,  
PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL 134, PART 153 D, DATED JUNE 7, 2017.

ND : NON-DETECTABLE.

  
 (MR BHUCHONK PANICHLERTUMPI)  
 LABORATORY SUPERVISOR

AUGUST 8, 2022



## United Analyst and Engineering Consultant Co., Ltd.

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

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

NSC-TISI-TIS 17025  
TESTING 0207TESTING  
No. 0063

## ANALYSIS REPORT

**CUSTOMER NAME** : TPI POLENE PUBLIC COMPANY LIMITED

**ADDRESS** : 299 MOO 5 MITRAPARP ROAD MITTRAPHAP TABKWANG KAENGKOI SARABURI 18260

**CONTACT INFORMATION** : TEL : [REDACTED] e-mail : [REDACTED]

**SAMPLING SOURCE** : TRIANGULAR POND AREA

**SAMPLE TYPE** : EFFLUENT

**SAMPLING DATE** : AUGUST 23, 2022

**SAMPLING TIME** : 10:00 HOUR

**SAMPLING METHOD** : GRAB, GRAB AND STERILE TECHNIQUE

**SAMPLING BY** : MR MANIT PANCHOT

**ANALYZED BY** : MISS AMONRAT PUTTALEE

**RECEIVED DATE** : AUGUST 23, 2022

**ANALYTICAL DATE** : AUGUST 23-30, 2022

**REPORT NO.** : [REDACTED]

**WORK NO.** : [REDACTED]

**ANALYSIS NO.** : [REDACTED]

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			EFFLUENT T22AQ527-0006		
pH <sup>a</sup>	-	ELECTROMETRIC METHOD AT SITE (SM:4500-H <sup>+</sup> B)	8.3 (31°C)	5.5-9.0	-
TEMPERATURE <sup>c</sup>	°C	THERMOMETER AT SITE (SM: 2550 B)	31	≤ 40	-
ELECTRICAL CONDUCTIVITY <sup>c</sup>	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2510 B)	731 (31°C)	-	0.1
DISSOLVED OXYGEN <sup>c</sup>	mg/L	MEMBRANE ELECTRODE METHOD AT SITE (SM: 4500-O G)	2.8	-	0.5
ODOUR <sup>c</sup>	-	OBSERVATION METHOD	NONE	-	-
SALINITY <sup>c</sup>	ppt	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2520 B)	0.3	-	0.1
TURBIDITY <sup>c</sup>	NTU	NEPHELOMETRIC METHOD (SM: 2130 B)	50	-	0.1
COLOUR (ORIGINAL pH) <sup>b</sup>	ADMI	ADMI WEIGHTED-ORDINATE SPECTROPHOTOMETRIC METHOD (SM: 2120 F)	14	≤ 300	10
COLOUR (pH 7.0) <sup>b</sup>	ADMI	ADMI WEIGHTED-ORDINATE SPECTROPHOTOMETRIC METHOD (SM: 2120 F)	13	≤ 300	10
BIOCHEMICAL OXYGEN DEMAND <sup>a</sup>	mg/L	MEMBRANE ELECTRODE METHOD (SM: 4500-O G AND 5210 B)	2.4	≤ 20	2.0
CHEMICAL OXYGEN DEMAND <sup>a</sup>	mg/L	CLOSED REFLUX, COLOURIMETRIC METHOD (SM: 5220 D)	28.2	≤ 120	25.0
TOTAL SUSPENDED SOLIDS <sup>a</sup>	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: 2540 D)	21.3	≤ 50	5.0
TOTAL DISSOLVED SOLIDS <sup>b</sup>	mg/L	TOTAL DISSOLVED SOLIDS DRIED AT 180 °C (SM: 2540 C)	592	≤ 3,000	25
TOTAL KJELDAHL NITROGEN <sup>b</sup>	mg/L	IN-HOUSE METHOD: UAE.TP.WAS.001 (KJELDAHL METHOD); SM: 4500-Norg C	5.4	≤ 100	1.5
FAT, OIL AND GREASE <sup>a</sup>	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: 5520 B)	ND	≤ 5	3
NITRATE-NITROGEN <sup>c</sup>	mg/L NO <sub>3</sub> <sup>-</sup> -N	CADMIUM REDUCTION METHOD (SM: 4500 -NO <sub>3</sub> <sup>-</sup> E)	0.33	-	0.02
SULPHIDE <sup>b</sup>	mg/L	IODOMETRIC METHOD (SM: 4500-S <sup>2-</sup> F)	< 0.50	≤ 1	0.50
SULPHATE <sup>c</sup>	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: 4500-SO <sub>4</sub> <sup>2-</sup> E)	80.8	-	0.3
PHOSPHATE <sup>c</sup>	mg/L PO <sub>4</sub> <sup>3-</sup>	ASCORBIC ACID METHOD (SM: 4500-P E)	0.15	-	0.03
CYANIDE <sup>c</sup>	mg/L CN <sup>-</sup>	DISTILLATION, PYRIDINE-BARBITURIC ACID METHOD (SM: 4500-CN <sup>-</sup> C AND 4500 -CN <sup>-</sup> E)	ND	≤ 0.2	0.005





PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			EFFLUENT T22AQ527-0006		
PHENOLS °	mg/L	DISTILLATION, 4-AMINOANTIPYRINE METHOD (SM: 5530 B AND 5530 D)	ND	≤ 1	0.1
FORMALDEHYDE °	mg/L	DISTILLATION AND COLOURIMETRIC METHOD	ND	≤ 1	0.05
RESIDUAL CHLORINE °	mg/L Cl <sub>2</sub>	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	ND	-	0.1
TOTAL HARDNESS °	mg/L as CaCO <sub>3</sub>	EDTA TITRIMETRIC METHOD (SM: 2340 C)	188	-	4.0
FREE CHLORINE °	mg/L Cl <sub>2</sub>	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	ND	≤ 1	0.1
SODIUM ADSORPTION RATIO °	-	INDUCTIVELY COUPLED PLASMA (ICP) AND CALCULATION METHOD	0.979	-	-
<b>METALS</b>					
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	0.0022	≤ 0.25	0.0003
SELENIUM °	mg/L Se	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	ND	≤ 0.02	0.0005
TRIVALENT CHROMIUM °	mg/L Cr <sup>3+</sup>	NITRIC ACID DIGESTION, DIRECT AIR ACETYLENE FLAME, COLOURIMETRIC (SM: 3030 E, 3111 B AND 3500-Cr B) AND CALCULATION METHOD	ND	≤ 0.75	0.007
HEXAVALENT CHROMIUM °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: 3500-Cr B)	ND	≤ 0.25	0.006
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.03	0.002
TOTAL IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	0.937	-	0.005
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	< LOQ	≤ 2.0	0.005
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.2	0.015
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	0.065	≤ 5.0	0.004
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 1.0	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	< LOQ	≤ 5.0	0.003
MERCURY °	mg/L Hg	COLD VAPOUR AAS METHOD (SM: 3112 B)	0.0006	≤ 0.005	0.0005
BARIUM °	mg/L Ba	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	0.051	≤ 1.0	0.005





PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			EFFLUENT T22AQ527-0006		
TITANIUM <sup>c</sup>	mg/L Ti	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	0.015	-	0.010
MICROBIOLOGY					
COLIFORM BACTERIA <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: 9221 B)	54,000	-	1.8
FAECAL COLIFORM BACTERIA <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: 9221 E)	35,000	-	1.8
ORGANOCHLORINE PESTICIDES					
α-BHC <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.02
β-BHC <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.02
γ-BHC <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.02
δ-BHC <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.02
ALDRIN <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.02
DIELDRIN <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.02
ENDOSULFAN I <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.02
ENDOSULFAN II <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.04
ENDOSULFAN SULFATE <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.04
ENDRIN <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.04
ENDRIN ALDEHYDE <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.04
HEPTACHLOR <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.02
HEPTACHLOR EPOXIDE <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.02
p,p-DDD <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.04
p,p-DDE <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.04



PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			EFFLUENT T22AQ527-0006		
p,p-DDT <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.04
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR BROWN		

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITEDIN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.REGULATORY STANDARD : INDUSTRIAL EFFLUENT STANDARDS, NOTIFICATION OF THE MINISTRY OF INDUSTRY, B.E. 2560,  
PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL 134, PART 153 D, DATED JUNE 7, 2017.

ND : NON-DETECTABLE.

&lt; LOQ : &lt; LIMIT OF QUANTITATION (COPPER ≥ 0.005 AND &lt; 0.050 mg/L, ZINC ≥ 0.003 AND &lt; 0.050 mg/L).

Wondershare  
PDFelement

(MISS BENJAWAN VIRIYOTHAI)  
LABORATORY SUPERVISOR

SEPTEMBER 12, 2022



## United Analyst and Engineering Consultant Co., Ltd.

3 Soi Udomsuk 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



NSC - TISI - TIS 17025

TESTING 0207

TESTING

No. 0063

## ANALYSIS REPORT

**CUSTOMER NAME** : TPI POLENE PUBLIC COMPANY LIMITED

**ADDRESS** : 299 MOO 5 MITRAPARP ROAD MITTRAPHAP TABKWANG KAENGKOI SARABURI 18260

**CONTACT INFORMATION** : TEL : [REDACTED] e-mail : [REDACTED]

**SAMPLING SOURCE** : TRIANGULAR POND AREA

**SAMPLE TYPE** : EFFLUENT

**SAMPLING DATE** : SEPTEMBER 20, 2022

**SAMPLING TIME** : 09:10 HOUR

**SAMPLING METHOD** : GRAB, GRAB AND STERILE TECHNIQUE

**SAMPLING BY** : MR MANIT PANCHOT

**ANALYZED BY** : MISS PORNPIMOL WAENTHONG

**RECEIVED DATE** : SEPTEMBER 20, 2022

**ANALYTICAL DATE** : SEPTEMBER 20-30, 2022

**REPORT NO.** : [REDACTED]

**WORK NO.** : [REDACTED]

**ANALYSIS NO.** : [REDACTED]

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			EFFLUENT T22AS677-0001		
pH <sup>a</sup>	-	ELECTROMETRIC METHOD AT SITE (SM:4500-H <sup>+</sup> B)	8.3 (34°C)	5.5-9.0	-
TEMPERATURE <sup>c</sup>	°C	THERMOMETER AT SITE (SM: 2550 B)	34	≤ 40	-
ELECTRICAL CONDUCTIVITY <sup>c</sup>	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2510 B)	700 (34°C)	-	0.1
DISSOLVED OXYGEN <sup>c</sup>	mg/L	MEMBRANE ELECTRODE METHOD AT SITE (SM: 4500-O G)	3.3	-	0.5
SALINITY <sup>c</sup>	ppt	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2520 B)	0.4	-	0.1
TURBIDITY <sup>c</sup>	NTU	NEPHELOMETRIC METHOD (SM: 2130 B)	70	-	0.1
BIOCHEMICAL OXYGEN DEMAND <sup>a</sup>	mg/L	MEMBRANE ELECTRODE METHOD (SM: 4500-O G AND 5210 B)	ND	≤ 20	2.0
CHEMICAL OXYGEN DEMAND <sup>a</sup>	mg/L	CLOSED REFLUX, COLOURIMETRIC METHOD (SM: 5220 D)	ND	≤ 120	25.0
TOTAL SUSPENDED SOLIDS <sup>a</sup>	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: 2540 D)	22.7	≤ 50	5.0
TOTAL DISSOLVED SOLIDS <sup>b</sup>	mg/L	TOTAL DISSOLVED SOLIDS DRIED AT 180 °C (SM: 2540 C)	398	≤ 3,000	25
TOTAL HARDNESS <sup>c</sup>	mg/L as CaCO <sub>3</sub>	EDTA TITRIMETRIC METHOD (SM: 2340 C)	163	-	4.0
NITRATE-NITROGEN <sup>c</sup>	mg/L NO <sub>3</sub> <sup>-</sup> -N	CADMIUM REDUCTION METHOD (SM: 4500 -NO <sub>3</sub> <sup>-</sup> : E)	0.16	-	0.02
PHOSPHATE <sup>c</sup>	mg/L PO <sub>4</sub> <sup>3-</sup>	ASCORBIC ACID METHOD (SM: 4500-P E)	0.06	-	0.03
RESIDUAL CHLORINE <sup>c</sup>	mg/L Cl <sub>2</sub>	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	ND	-	0.1
SULPHATE <sup>c</sup>	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: 4500-SO <sub>4</sub> <sup>2-</sup> : E)	83.5	-	0.3
FAT, OIL AND GREASE <sup>a</sup>	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: 5520 B)	ND	≤ 5	3
SODIUM ADSORPTION RATIO <sup>c</sup>	-	INDUCTIVELY COUPLED PLASMA (ICP) AND CALCULATION METHOD	1.23	-	-
METALS					
ARSENIC <sup>c</sup>	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	0.0019	≤ 0.25	0.0003
BARIUM <sup>c</sup>	mg/L Ba	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	0.049	≤ 1.0	0.005







PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			EFFLUENT T22AS677-0001		
CADMIUM <sup>c</sup>	mg/L Cd	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.03	0.002
HEXAVALENT CHROMIUM <sup>c</sup>	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: 3500-Cr B)	ND	≤ 0.25	0.006
COPPER <sup>c</sup>	mg/L Cu	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 2.0	0.005
LEAD <sup>c</sup>	mg/L Pb	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.2	0.015
MANGANESE <sup>c</sup>	mg/L Mn	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	< LOQ	≤ 5.0	0.004
MERCURY <sup>c</sup>	mg/L Hg	COLD VAPOUR AAS METHOD (SM: 3112 B)	ND	≤ 0.005	0.0005
NICKEL <sup>c</sup>	mg/L Ni	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 1.0	0.005
SELENIUM <sup>c</sup>	mg/L Se	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	ND	≤ 0.02	0.0005
TITANIUM <sup>c</sup>	mg/L Ti	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	ND	-	0.010
TOTAL IRON <sup>c</sup>	mg/L Fe	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	0.244	-	0.005
ZINC <sup>c</sup>	mg/L Zn	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 5.0	0.003



PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			EFFLUENT T22AS677-0001		
MICROBIOLOGY					
FAECAL COLIFORM BACTERIA <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: 9221 E)	17,000	-	1.8
COLIFORM BACTERIA <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: 9221 B)	17,000	-	1.8
SAMPLE CONDITION					
WATER'S COLOUR/TURBID			YELLOW/CLEAR		
SEDIMENT			BROWN		

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

 IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

 SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

 REGULATORY STANDARD : INDUSTRIAL EFFLUENT STANDARDS, NOTIFICATION OF THE MINISTRY OF INDUSTRY, B.E. 2560,  
PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL 134, PART 153 D, DATED JUNE 7, 2017.

ND : NON-DETECTABLE.

 < LOQ : < LIMIT OF QUANTITATION (MANGANESE  $\geq 0.004$  AND < 0.050 mg/L)

(MISS BENJAWAN VIRIYOTHA)

LABORATORY SUPERVISOR

OCTOBER 10, 2022



## ANALYSIS REPORT

**CUSTOMER NAME** : TPI POLENE PUBLIC COMPANY LIMITED

**ADDRESS** : 299 MOO 5 MITRAPARP ROAD MITTRAPHAP TABKWANG KAENGKOI SARABURI 18260

**CONTACT INFORMATION** : TEL : [REDACTED] e-mail : [REDACTED]

**SAMPLING SOURCE** : TRIANGULAR POND AREA

**SAMPLE TYPE** : EFFLUENT

**SAMPLING DATE** : OCTOBER 17, 2022

**SAMPLING TIME** : 09:40 HOUR

**SAMPLING METHOD °** : GRAB, GRAB AND STERILE TECHNIQUE

**SAMPLING BY °** : MR ACHITA SAENGJAN

**ANALYZED BY** : MISS AMONRAT PUTTALEE

**RECEIVED DATE** : OCTOBER 17, 2022

**ANALYTICAL DATE** : OCTOBER 17-28, 2022

**REPORT NO.** : [REDACTED]

**WORK NO.** : [REDACTED]

**ANALYSIS NO.** : [REDACTED]

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			EFFLUENT T22AU553-0001		
pH °	-	ELECTROMETRIC METHOD AT SITE (SM:4500-H° B)	8.0 (32°C)	5.5-9.0	-
TEMPERATURE °	°C	THERMOMETER AT SITE (SM: 2550 B)	32	≤ 40	-
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2510 B)	1,074 (32°C)	-	0.1
DISSOLVED OXYGEN °	mg/L	MEMBRANE ELECTRODE METHOD AT SITE (SM: 4500-O G)	3.1	-	0.5
SALINITY °	ppt	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2520 B)	0.5	-	0.1
TURBIDITY °	NTU	NEPHELOMETRIC METHOD (SM: 2130 B)	30	-	0.1
BIOCHEMICAL OXYGEN DEMAND °	mg/L	MEMBRANE ELECTRODE METHOD (SM: 4500-O G AND 5210 B)	ND	≤ 20	2.0
CHEMICAL OXYGEN DEMAND °	mg/L	CLOSED REFLUX, COLOURIMETRIC METHOD (SM: 5220 D)	ND	≤ 120	25.0
TOTAL SUSPENDED SOLIDS °	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: 2540 D)	15.8	≤ 50	5.0
TOTAL DISSOLVED SOLIDS °	mg/L	TOTAL DISSOLVED SOLIDS DRIED AT 180 °C (SM: 2540 C)	578	≤ 3,000	25
TOTAL HARDNESS °	mg/L as CaCO <sub>3</sub>	EDTA TITRIMETRIC METHOD (SM: 2340 C)	251	-	4.0
NITRATE-NITROGEN °	mg/L NO <sub>3</sub> -N	CADMIUM REDUCTION METHOD (SM: 4500 -NO <sub>3</sub> -E)	0.56	-	0.02
PHOSPHATE °	mg/L PO <sub>4</sub> <sup>3-</sup>	ASCORBIC ACID METHOD (SM: 4500-P E)	0.24	-	0.03
RESIDUAL CHLORINE °	mg/L Cl <sub>2</sub>	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	ND	-	0.1
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: 4500-SO <sub>4</sub> <sup>2-</sup> -E)	103	-	0.3
FAT, OIL AND GREASE °	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: 5520 B)	ND	≤ 5	3
SODIUM ADSORPTION RATIO °	-	INDUCTIVELY COUPLED PLASMA (ICP) AND CALCULATION METHOD	1.97	-	-







PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			EFFLUENT T22AU553-0001		
METALS					
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	0.0019	≤ 0.25	0.0003
BARIUM °	mg/L Ba	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	0.074	≤ 1.0	0.005
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.03	0.002
HEXAVALENT CHROMIUM °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: 3500-Cr B)	ND	≤ 0.25	0.006
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 2.0	0.005
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.2	0.015
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	0.125	≤ 5.0	0.004
MERCURY °	mg/L Hg	COLD VAPOUR AAS METHOD (SM: 3112 B)	ND	≤ 0.005	0.0005
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 1.0	0.005
SELENIUM °	mg/L Se	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	ND	≤ 0.02	0.0005
TITANIUM °	mg/L Ti	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	0.012	-	0.010
TOTAL IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	0.185	-	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	< LOQ	≤ 5.0	0.003



PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			EFFLUENT T22AU553-0001		
MICROBIOLOGY					
COLIFORM BACTERIA <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: 9221 B)	54,000	-	1.8
FAECAL COLIFORM BACTERIA <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: 9221 E)	35,000	-	1.8
SAMPLE CONDITION					
WATER'S COLOUR/TURBID SEDIMENT			YELLOW/TURBID  BROWN		

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

 IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

 SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

 REGULATORY STANDARD : INDUSTRIAL EFFLUENT STANDARDS, NOTIFICATION OF THE MINISTRY OF INDUSTRY, B.E. 2560,  
 PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL 134, PART 153 D, DATED JUNE 7, 2017.

ND : NON-DETECTABLE.

 < LOQ : < LIMIT OF QUANTITATION (ZINC  $\geq$  0.003 AND < 0.050 mg/L).


  
 (MR BHUCHONK PANICHLERTUMPI)  
 LABORATORY SUPERVISOR

NOVEMBER 7, 2022



## United Analyst and Engineering Consultant Co., Ltd.

3 Soi Udomsuk 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

NSC-TISI-TIS 17025  
TESTING 0207TESTING  
No. 0063

## ANALYSIS REPORT

**CUSTOMER NAME** : TPI POLENE PUBLIC COMPANY LIMITED

**ADDRESS** : 299 MOO 5 MITRAPARP ROAD MITTRAPHAP TABKWANG KAENGKOI SARABURI 18260

**CONTACT INFORMATION** : TEL : [REDACTED] e-mail : [REDACTED]

**SAMPLING SOURCE** : TRIANGULAR POND AREA

**SAMPLE TYPE** : EFFLUENT

**SAMPLING DATE** : NOVEMBER 14, 2022

**SAMPLING TIME** : 09:35 HOUR

**SAMPLING METHOD** : GRAB, GRAB AND STERILE TECHNIQUE

**SAMPLING BY** : MR MANIT PANCHOT

**ANALYZED BY** : MISS AMONRAT PUTTALEE

**RECEIVED DATE** : NOVEMBER 14, 2022

**ANALYTICAL DATE** : NOVEMBER 14-22, 2022

**REPORT NO.** : [REDACTED]

**WORK NO.** : [REDACTED]

**ANALYSIS NO.** : [REDACTED]

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			EFFLUENT T22AW694-0006		
pH <sup>a</sup>	-	ELECTROMETRIC METHOD AT SITE (SM:4500-H <sup>+</sup> B)	7.9 (31°C)	5.5-9.0	-
TEMPERATURE <sup>c</sup>	°C	THERMOMETER AT SITE (SM: 2550 B)	31	≤ 40	-
ELECTRICAL CONDUCTIVITY <sup>c</sup>	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2510 B)	1,123 (31°C)	-	0.1
TURBIDITY <sup>c</sup>	NTU	NEPHELOMETRIC METHOD (SM: 2130 B)	18	-	0.1
ODOUR <sup>c</sup>	-	OBSERVATION METHOD	NONE	-	-
COLOUR (ORIGINAL pH) <sup>b</sup>	ADMI	ADMI WEIGHTED-ORDINATE SPECTROPHOTOMETRIC METHOD (SM: 2120 F)	13	≤ 300	10
COLOUR (pH 7.0) <sup>b</sup>	ADMI	ADMI WEIGHTED-ORDINATE SPECTROPHOTOMETRIC METHOD (SM: 2120 F)	12	≤ 300	10
SALINITY <sup>c</sup>	ppt	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2520 B)	0.5	-	0.1
DISSOLVED OXYGEN <sup>c</sup>	mg/L	MEMBRANE ELECTRODE METHOD AT SITE (SM: 4500-O G)	2.7	-	0.5
BIOCHEMICAL OXYGEN DEMAND <sup>a</sup>	mg/L	MEMBRANE ELECTRODE METHOD (SM: 4500-O G AND 5210 B)	4.3	≤ 20	2.0
CHEMICAL OXYGEN DEMAND <sup>a</sup>	mg/L	CLOSED REFLUX, COLOURIMETRIC METHOD (SM: 5220 D)	29.7	≤ 120	25.0
TOTAL SUSPENDED SOLIDS <sup>a</sup>	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: 2540 D)	10.6	≤ 50	5.0
TOTAL DISSOLVED SOLIDS <sup>b</sup>	mg/L	TOTAL DISSOLVED SOLIDS DRIED AT 180 °C (SM: 2540 C)	588	≤ 3,000	25
TOTAL HARDNESS <sup>c</sup>	mg/L as CaCO <sub>3</sub>	EDTA TITRIMETRIC METHOD (SM: 2340 C)	260	-	4.0
CYANIDE <sup>c</sup>	mg/L CN <sup>-</sup>	DISTILLATION, PYRIDINE-BARBITURIC ACID METHOD (SM: 4500-CN <sup>-</sup> C AND 4500 -CN <sup>-</sup> E)	ND	≤ 0.2	0.005
FORMALDEHYDE <sup>c</sup>	mg/L	DISTILLATION AND COLOURIMETRIC METHOD	ND	≤ 1	0.05
FREE CHLORINE <sup>c</sup>	mg/L Cl <sub>2</sub>	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	ND	≤ 1	0.1
NITRATE-NITROGEN <sup>c</sup>	mg/L NO <sub>3</sub> <sup>-</sup> -N	CADMIUM REDUCTION METHOD (SM: 4500 -NO <sub>3</sub> <sup>-</sup> E)	1.52	-	0.02
PHENOLS <sup>c</sup>	mg/L	DISTILLATION, 4-AMINOANTIPYRINE METHOD (SM: 5530 B AND 5530 D)	ND	≤ 1	0.1
PHOSPHATE <sup>c</sup>	mg/L PO <sub>4</sub> <sup>3-</sup>	ASCORBIC ACID METHOD (SM: 4500-P E)	0.31	-	0.03







PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			EFFLUENT T22AW694-0006		
RESIDUAL CHLORINE <sup>c</sup>	mg/L Cl <sub>2</sub>	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	ND	-	0.1
SULPHATE <sup>c</sup>	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: 4500-SO <sub>4</sub> <sup>2-</sup> E)	63.0	-	0.3
SULPHIDE <sup>b</sup>	mg/L	IODOMETRIC METHOD (SM: 4500-S <sup>2-</sup> F)	< 0.50	≤ 1	0.50
TOTAL KJELDAHL NITROGEN <sup>b</sup>	mg/L	IN-HOUSE METHOD: UAE.TP.WAS.001 (KJELDAHL METHOD); SM: 4500-Norg C	< LOQ	≤ 100	1.5
FAT, OIL AND GREASE <sup>a</sup>	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: 5520 B)	ND	≤ 5	3
SODIUM ADSORPTION RATIO <sup>c</sup>	-	INDUCTIVELY COUPLED PLASMA (ICP) AND CALCULATION METHOD	1.55	-	-
<b>METALS</b>					
ARSENIC <sup>c</sup>	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	0.0017	≤ 0.25	0.0003
BARIUM <sup>c</sup>	mg/L Ba	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	0.077	≤ 1.0	0.005
CADMIUM <sup>c</sup>	mg/L Cd	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.03	0.002
HEXAVALENT CHROMIUM <sup>c</sup>	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: 3500-Cr B)	ND	≤ 0.25	0.006
TRIVALENT CHROMIUM <sup>c</sup>	mg/L Cr <sup>3+</sup>	NITRIC ACID DIGESTION, DIRECT AIR ACETYLENE FLAME, COLOURIMETRIC (SM: 3030 E, 3111 B AND 3500-Cr B) AND CALCULATION METHOD	ND	≤ 0.75	0.007
COPPER <sup>c</sup>	mg/L Cu	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 2.0	0.005
LEAD <sup>c</sup>	mg/L Pb	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.2	0.015
MANGANESE <sup>c</sup>	mg/L Mn	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	< LOQ	≤ 5.0	0.004
MERCURY <sup>c</sup>	mg/L Hg	COLD VAPOUR AAS METHOD (SM: 3112 B)	ND	≤ 0.005	0.0005
NICKEL <sup>c</sup>	mg/L Ni	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 1.0	0.005
SELENIUM <sup>c</sup>	mg/L Se	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	ND	≤ 0.02	0.0005
TITANIUM <sup>c</sup>	mg/L Ti	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	ND	-	0.010
TOTAL IRON <sup>c</sup>	mg/L Fe	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	0.147	-	0.005



PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			EFFLUENT T22AW694-0006		
ZINC <sup>c</sup>	mg/L Zn	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 5.0	0.003
MICROBIOLOGY					
FAECAL COLIFORM BACTERIA <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: 9221 E)	7,000	-	1.8
COLIFORM BACTERIA <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: 9221 B)	11,000	-	1.8
ORGANOCHLORINE PESTICIDES					
α-BHC <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.02
β-BHC <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.02
γ-BHC <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.02
δ-BHC <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.02
ALDRIN <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.02
DIELDRIN <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.02
ENDOSULFAN I <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.02
ENDOSULFAN II <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.04
ENDOSULFAN SULFATE <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.04
ENDRIN <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.04
ENDRIN ALDEHYDE <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.04
HEPTACHLOR <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.02
HEPTACHLOR EPOXIDE <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.02
p,p-DDD <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.04
p,p-DDE <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.04



## United Analyst and Engineering Consultant Co., Ltd.

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

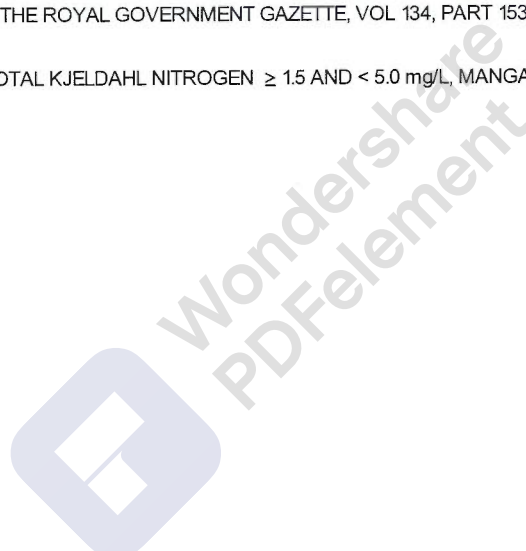
Tel. 0 2763 2828 Fax 0 2763 2800 www.uaeconsultant.com E-mail: uae@uaeconsultant.com

NSC - TISI - TIS 17025  
TESTING 0207TESTING  
No. 0063

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			EFFLUENT T22AW694-0006		
p,p-DDT <sup>c</sup>	µg/L	LIQUID-LIQUID EXTRACTION GAS CHROMATOGRAPHIC (ECD) METHOD (SM: 6630 C)	ND	NONE	0.04
<b>SAMPLE CONDITION</b> WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR BROWN		

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITEDIN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.REGULATORY STANDARD : INDUSTRIAL EFFLUENT STANDARDS, NOTIFICATION OF THE MINISTRY OF INDUSTRY, B.E. 2560,  
PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL 134, PART 153 D, DATED JUNE 7, 2017.

ND : NON-DETECTABLE.

< LOQ : < LIMIT OF QUANTITATION (TOTAL KJELDAHL NITROGEN  $\geq$  1.5 AND < 5.0 mg/L, MANGANESE  $\geq$  0.004 AND < 0.050 mg/L).(MISS BENJAWAN VIRIYOTHAI)  
LABORATORY SUPERVISOR

DECEMBER 2, 2022





## ANALYSIS REPORT

**CUSTOMER NAME** : TPI POLENE PUBLIC COMPANY LIMITED

**ADDRESS** : 299 MOO 5 MITRAPARP ROAD MITTRAPHAP TABKWANG KAENGKOI SARABURI 18260

**CONTACT INFORMATION** : TEL : [REDACTED] e-mail : [REDACTED]

**SAMPLING SOURCE** : TRIANGULAR POND AREA

**SAMPLE TYPE** : EFFLUENT

**SAMPLING DATE** : DECEMBER 14, 2022

**SAMPLING TIME** : 10:20 HOUR

**SAMPLING METHOD °** : GRAB, GRAB AND STERILE TECHNIQUE

**SAMPLING BY °** : MR SOMCHART UTHUMRAT

**ANALYZED BY** : MISS AMONRAT PUTTALEE

**RECEIVED DATE** : DECEMBER 14, 2022

**ANALYTICAL DATE** : DECEMBER 14-22, 2022

**REPORT NO.** : [REDACTED]

**WORK NO.** : [REDACTED]

**ANALYSIS NO.** : [REDACTED]

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			EFFLUENT T22AY907-0001		
pH °	-	ELECTROMETRIC METHOD AT SITE (SM:4500-H+ B)	7.6 (27°C)	5.5-9.0	-
TEMPERATURE °	°C	THERMOMETER AT SITE (SM: 2550 B)	27	≤ 40	-
ELECTRICAL CONDUCTIVITY °	µmhos/cm	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2510 B)	1,005 (27°C)	-	0.1
DISSOLVED OXYGEN °	mg/L	MEMBRANE ELECTRODE METHOD AT SITE (SM: 4500-O G)	3.1	-	0.5
SALINITY °	ppt	ELECTRICAL CONDUCTIVITY METHOD AT SITE (SM: 2520 B)	0.5	-	0.1
TURBIDITY °	NTU	NEPHELOMETRIC METHOD (SM: 2130 B)	24	-	0.1
BIOCHEMICAL OXYGEN DEMAND °	mg/L	MEMBRANE ELECTRODE METHOD (SM: 4500-O G AND 5210 B)	7.3	≤ 20	2.0
CHEMICAL OXYGEN DEMAND °	mg/L	CLOSED REFLUX, COLOURIMETRIC METHOD (SM: 5220 D)	ND	≤ 120	25.0
TOTAL SUSPENDED SOLIDS °	mg/L	TOTAL SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: 2540 D)	18.1	≤ 50	5.0
TOTAL DISSOLVED SOLIDS °	mg/L	TOTAL DISSOLVED SOLIDS DRIED AT 180 °C (SM: 2540 C)	614	≤ 3,000	25
TOTAL HARDNESS °	mg/L as CaCO <sub>3</sub>	EDTA TITRIMETRIC METHOD (SM: 2340 C)	299	-	4.0
NITRATE-NITROGEN °	mg/L NO <sub>3</sub> -N	CADMIUM REDUCTION METHOD (SM: 4500 -NO <sub>3</sub> - E)	3.40	-	0.02
PHOSPHATE °	mg/L PO <sub>4</sub> <sup>3-</sup>	ASCORBIC ACID METHOD (SM: 4500-P E)	0.15	-	0.03
RESIDUAL CHLORINE °	mg/L Cl <sub>2</sub>	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	ND	-	0.1
SULPHATE °	mg/L SO <sub>4</sub> <sup>2-</sup>	TURBIDIMETRIC METHOD (SM: 4500-SO <sub>4</sub> <sup>2-</sup> E)	72.2	-	0.3
FAT, OIL AND GREASE °	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: 5520 B)	ND	≤ 5	3
SODIUM ADSORPTION RATIO °	-	INDUCTIVELY COUPLED PLASMA (ICP) AND CALCULATION METHOD	1.52	-	-





PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			EFFLUENT T22AY907-0001		
METALS					
ARSENIC °	mg/L As	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	0.0023	≤ 0.25	0.0003
BARIUM °	mg/L Ba	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	0.071	≤ 1.0	0.005
CADMIUM °	mg/L Cd	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	< LOQ	≤ 0.03	0.002
HEXAVALENT CHROMIUM °	mg/L Cr <sup>6+</sup>	COLOURIMETRIC METHOD (SM: 3500-Cr B)	ND	≤ 0.25	0.006
COPPER °	mg/L Cu	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	< LOQ	≤ 2.0	0.005
LEAD °	mg/L Pb	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 0.2	0.015
MANGANESE °	mg/L Mn	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	0.058	≤ 5.0	0.004
MERCURY °	mg/L Hg	COLD VAPOUR AAS METHOD (SM: 3112 B)	ND	≤ 0.005	0.0005
NICKEL °	mg/L Ni	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 1.0	0.005
SELENIUM °	mg/L Se	HYDRIDE GENERATION AAS METHOD (SM: 3114 C)	ND	≤ 0.02	0.0005
TITANIUM °	mg/L Ti	NITRIC ACID-HYDROCHLORIC ACID DIGESTION AND INDUCTIVELY COUPLED PLASMA (ICP) METHOD (SM: 3030 F AND 3120 B)	ND	-	0.010
TOTAL IRON °	mg/L Fe	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	0.205	-	0.005
ZINC °	mg/L Zn	IN-HOUSE METHOD: UAE.TP.IW.01 (NITRIC ACID DIGESTION AND DIRECT AIR ACETYLENE FLAME METHOD); SM: 3030 E AND 3111 B	ND	≤ 5.0	0.003



PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			EFFLUENT T22AY907-0001		
MICROBIOLOGY					
FAECAL COLIFORM BACTERIA <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: 9221 E)	54,000	-	1.8
COLIFORM BACTERIA <sup>b</sup>	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: 9221 B)	54,000	-	1.8
SAMPLE CONDITION			YELLOW/CLEAR  BROWN		
WATER'S COLOUR/TURBID					
SEDIMENT					

<sup>a</sup> : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

<sup>b</sup> : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

<sup>c</sup> : VERIFIED BY OWN LABORATORY QUALITY SYSTEM, BUT STILL NOT ACCREDITED

IN-HOUSE : BASED ON STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23<sup>rd</sup> EDITION, 2017.

REGULATORY STANDARD : INDUSTRIAL EFFLUENT STANDARDS, NOTIFICATION OF THE MINISTRY OF INDUSTRY, B.E. 2560,  
PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL 134, PART 153 D, DATED JUNE 7, 2017.

ND : NON-DETECTABLE.

< LOQ : < LIMIT OF QUANTITATION (CADMIUM  $\geq 0.002$  AND  $< 0.020$  mg/L, COPPER  $\geq 0.005$  AND  $< 0.050$  mg/L).

(MR BHUCHONK PANICHLERTUMPI)  
LABORATORY SUPERVISOR

DECEMBER 28, 2022