

ภาคผนวก ง

ผลการวิเคราะห์ทางห้องปฏิบัติการ

ภาคผนวก ง1

ผลการวิเคราะห์คุณภาพน้ำทิ้ง

ANALYSIS REPORT

CUSTOMER NAME : CARLTON HOTEL BANGKOK SUKHUMVIT
ADDRESS : 491 SUKUMVIT ROAD KHLONG TOEI NUEA WATTHANA BANGKOK 10110
CONTACT INFORMATION : TEL : 0 2090 7888 Ext.7804 e-mail : Piya.nalamphun@carltonhotel.co.th
SAMPLING SOURCE : WASTEWATER TREATMENT PLANT
SAMPLE TYPE : WASTEWATER
SAMPLING DATE : JULY 31, 2023
SAMPLING TIME : 1/
SAMPLING METHOD ^c : GRAB, GRAB AND STERILE TECHNIQUE
SAMPLING BY ^c :
ANALYZED BY :

RECEIVED DATE : JULY 31, 2023
ANALYTICAL DATE : JULY 31 - AUGUST 7, 2023
REPORT NO. : 2023-U065247
WORK NO. : 2022-008301
ANALYSIS NO. : T23AO641-0001 - T23AO641-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT		REGULATORY STANDARD	DETECTION LIMIT
			1 14:35 HOUR 1/ T23AO641-0001	2 14:30 HOUR 1/ T23AO641-0002		
pH ^c	-	ELECTROMETRIC METHOD AT SITE (SM: PART 4500-H ⁺ B)	6.9 (32°C)	7.5 (34°C)	5-9	-
BIOCHEMICAL OXYGEN DEMAND ^a	mg/L	MEMBRANE ELECTRODE METHOD (SM: PART 5210 B AND PART 4500-O G)	444	25.7	≤ 20	2.0
SUSPENDED SOLIDS ^a	mg/L	SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: PART 2540 D)	319	91.3	≤ 30	5.0
TOTAL DISSOLVED SOLIDS ^b	mg/L	IN-HOUSE METHOD: UAE.TP.WAO.007 (TOTAL DISSOLVED SOLIDS DRIED AT 103-105 °C); SM: PART 2540 C	522	450	500*	25
SULPHIDE ^b	mg/L	IODOMETRIC METHOD (SM: PART 4500-S ²⁻ F)	0.67	< 0.50	≤ 1.0	0.50
TOTAL KJELDAHL NITROGEN ^b	mg/L	IN-HOUSE METHOD: UAE.TP.WAS.001 (KJELDAHL METHOD); SM: PART 4500-Norg C	27.1	< LOQ	≤ 35	1.5
FAT, OIL AND GREASE ^c	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: PART 5520 B)	17	ND	≤ 20	3



PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT		REGULATORY STANDARD	DETECTION LIMIT
			1 14:35 HOUR 1/ T23A0641-0001	2 14:30 HOUR 1/ T23A0641-0002		
MICROBIOLOGY						
COLIFORM BACTERIA ^b	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: PART 9221B)	>160,000	>160,000	-	1.8
SAMPLE CONDITION						
WATER'S COLOUR/TURBID			YELLOW/TURBID	YELLOW/TURBID		
SEDIMENT			BROWN	BROWN		

^a : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

^b : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

^c : 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, 23rd EDITION, 2017.

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

RESULT 1 : ปกติสภาพน้ำ

RESULT 2 : ปกติน้ำใส

REGULATORY STANDARD : RANGE OR MAXIMUM PERMITTED VALUE FOR BUILDING EFFLUENT STANDARDS CLASS A, NOTIFICATION OF THE
MINISTRY OF RESOURCES AND ENVIRONMENT, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL 122,
PART 125 D, DATED DECEMBER 29, 2005 AND VOL 139 SPECIAL PART 171 D, DATED JULY 21, 2022.

500* : PERMITTED EXCESS VALUE TO TOTAL DISSOLVED SOLIDS OF ACTUAL TAP WATER USED.

< LOQ : < LIMIT OF QUANTITATION (TOTAL KJELDAHL NITROGEN ≥ 1.5 AND < 5.0 mg/L).

LABORATORY SUPERVISOR

AUGUST 11, 2023

ANALYSIS REPORT

CUSTOMER NAME : CARLTON HOTEL BANGKOK SUKHUMVIT
ADDRESS : 491 SUKHUMVIT ROAD KHLONG TOEI NUEA WATTHANA BANGKOK 10110
CONTACT INFORMATION : TEL : 0 2090 7888 Ext.7804 e-mail : Piya.nalamphun@carltonhotel.co.th
SAMPLING SOURCE : WASTEWATER TREATMENT PLANT
SAMPLE TYPE : WASTEWATER
SAMPLING DATE : NOVEMBER 24, 2023
SAMPLING TIME : 1/
SAMPLING METHOD ^c : GRAB, GRAB AND STERILE TECHNIQUE
SAMPLING BY ^c :
ANALYZED BY :

RECEIVED DATE : NOVEMBER 24, 2023
ANALYTICAL DATE : NOVEMBER 24-30, 2023
REPORT NO. : 2023-U104700
WORK NO. : 2022-008301
ANALYSIS NO. : T23AX574-0001 - T23AX574-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT		REGULATORY STANDARD	DETECTION LIMIT
			1 10:55 HOUR 1/ T23AX574-0001	2 10:45 HOUR 1/ T23AX574-0002		
pH ^c	-	ELECTROMETRIC METHOD (AT SITE) SM: PART 4500-H ⁺ B AND 1060 B	6.9 (28°C)	6.6 (30°C)	5-9	-
BIOCHEMICAL OXYGEN DEMAND ^a	mg/L	MEMBRANE ELECTRODE METHOD (SM: PART 5210 B AND PART 4500-O G)	374	11.2	≤ 20	2.0
SUSPENDED SOLIDS ^a	mg/L	SUSPENDED SOLIDS DRIED AT 103-105 °C (SM: PART 2540 D)	167	22.6	≤ 30	5.0
TOTAL DISSOLVED SOLIDS ^b	mg/L	IN-HOUSE METHOD: UAE.TP.WAO.007 (TOTAL DISSOLVED SOLIDS DRIED AT 103-105 °C); SM: PART 2540 C	550	369	500*	25
SULPHIDE ^b	mg/L	IODOMETRIC METHOD (SM: PART 4500-S ²⁻ F)	2.5	< 0.50	≤ 1.0	0.50
TOTAL KJELDAHL NITROGEN ^b	mg/L	IN-HOUSE METHOD: UAE.TP.WAS.001 (KJELDAHL METHOD); SM: PART 4500-Norg C	49.4	< LOQ	≤ 35	1.5
FAT, OIL AND GREASE ^c	mg/L	LIQUID-LIQUID, PARTITION-GRAVIMETRIC METHOD (SM: PART 5520 B)	14	ND	≤ 20	3



PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT		REGULATORY STANDARD	DETECTION LIMIT
			1	2		
			10:55 HOUR 1/ T23AX574-0001	10:45 HOUR 1/ T23AX574-0002		
MICROBIOLOGY						
COLIFORM BACTERIA ^b	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: PART 9221B)	>160,000	7,900	-	1.8
SAMPLE CONDITION						
WATER'S COLOUR/TURBID			YELLOW/TURBID	YELLOW/TURBID		
SEDIMENT			BROWN	BROWN		

^a : ISO/IEC 17025 ACCREDITED BY THAI INDUSTRIAL STANDARDS INSTITUTE (TISI)

^b : ISO/IEC 17025 ACCREDITED BY DEPARTMENT OF SCIENCE SERVICE (DSS)

^c : 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, 23rd EDITION, 2017.

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

RESULT 1 : บ่อปรับสภาพน้ำ

RESULT 2 : บ่อน้ำใส

REGULATORY STANDARD : RANGE OR MAXIMUM PERMITTED VALUE FOR BUILDING EFFLUENT STANDARDS CLASS A, NOTIFICATION OF THE
MINISTRY OF RESOURCES AND ENVIRONMENT, PUBLISHED IN THE ROYAL GOVERNMENT GAZETTE, VOL 122,
PART 125 D, DATED DECEMBER 29, 2005 AND VOL 139 SPECIAL PART 171 D, DATED JULY 21, 2022.

500* : PERMITTED EXCESS VALUE TO TOTAL DISSOLVED SOLIDS OF ACTUAL TAP WATER USED.

ND : NON-DETECTABLE.

< LOQ : < LIMIT OF QUANTITATION (TOTAL KJELDAHL NITROGEN ≥ 1.5 AND < 5.0 mg/L).

LABORATORY SUPERVISOR

DECEMBER 6, 2023

ภาคผนวก ง2

ผลการวิเคราะห์คุณภาพน้ำหอฝิ่งเย็น

ANALYSIS REPORT

CUSTOMER NAME : CARLTON HOTEL BANGKOK SUKHUMVIT
ADDRESS : 491 SUKHUMVIT ROAD KHLONG TOEI NUEA WATTHANA BANGKOK 10110
CONTACT INFORMATION : TEL : 0 2090 7888 Ext.7804 e-mail : Piya.nalamphun@carltonhotel.co.th
SAMPLING SOURCE : COOLING TOWER
SAMPLE TYPE : COOLING WATER
SAMPLING DATE : DECEMBER 26, 2023
SAMPLING TIME : 15:20 HOUR
SAMPLING METHOD : GRAB, GRAB AND STERILE TECHNIQUE
SAMPLING BY :
ANALYZED BY :
RECEIVED DATE : DECEMBER 26, 2023
ANALYTICAL DATE : DECEMBER 26, 2023 - JANUARY 5, 2024
REPORT NO. : 2024-U003122
WORK NO. : 2022-008301
ANALYSIS NO. : T23BA070-0001

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			น้ำเข้ามาเติม ในอ่างรองรับ T23BA070-0001		
pH	-	ELECTROMETRIC METHOD (AT SITE) SM: PART 4500-H ⁺ B AND 1060 B	8.9 (22°C)	-	-
RESIDUAL CHLORINE	mg/L Cl ₂	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	ND	-	0.1
MICROBIOLOGY					
COLIFORM BACTERIA	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: PART 9221 B)	2.0	-	1.8
<i>Legionella</i> spp.	CFU/L	ISO 11731:2017-05 (E)	NOT DETECTED	NOT DETECTED	100
SAMPLE CONDITION WATER'S COLOUR/TURBID SEDIMENT			YELLOW/CLEAR -		

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

REGULATORY STANDARD : ANNOUNCEMENT OF THE DEPARTMENT OF HEALTH (THAILAND), PRACTICE FOR THE CONTROL OF LEGIONELLA BACTERIA IN COOLING TOWERS, JANUARY 2001.

ND : NON-DETECTABLE.

LABORATORY SUPERVISOR

JANUARY 12, 2024



ANALYSIS REPORT

CUSTOMER NAME : CARLTON HOTEL BANGKOK SUKHUMVIT
ADDRESS : 491 SUKUMVIT ROAD KHLONG TOEI NUEA WATTHANA BANGKOK 10110
CONTACT INFORMATION : TEL : 0 2090 7888 Ext.7804 e-mail : Piya.nalamphun@carltonhotel.co.th
SAMPLING SOURCE : COOLING TOWER
SAMPLE TYPE : COOLING WATER
SAMPLING DATE : DECEMBER 26, 2023
SAMPLING TIME : 15:15 HOUR
SAMPLING METHOD : GRAB, GRAB AND STERILE TECHNIQUE
SAMPLING BY :
ANALYZED BY :
RECEIVED DATE : DECEMBER 26, 2023
ANALYTICAL DATE : DECEMBER 26, 2023 - JANUARY 5, 2024
REPORT NO. : 2024-U003123
WORK NO. : 2022-008301
ANALYSIS NO. : T23BA070-0002

PARAMETER	UNIT	METHOD OF ANALYSIS	RESULT	REGULATORY STANDARD	DETECTION LIMIT
			พื่อน้ำทิ้งจาก หอผ่งเย็น T23BA070-0002		
pH	-	ELECTROMETRIC METHOD (AT SITE) SM: PART 4500-H ⁺ B AND 1060 B	8.9 (24°C)	-	-
RESIDUAL CHLORINE	mg/L Cl ₂	MODIFIED DPD COLOURIMETRIC METHOD (AT SITE)	ND	-	0.1
MICROBIOLOGY					
COLIFORM BACTERIA	MPN/100 mL	MULTIPLE-TUBE FERMENTATION TECHNIQUE (SM: PART 9221B)	< 1.8	-	1.8
<i>Legionella</i> spp.	CFU/L	ISO 11731:2017-05 (E)	NOT DETECTED	NOT DETECTED	100
SAMPLE CONDITION WATER'S COLOUR/TURBID SEDIMENT			COLOURLESS/CLEAR -		

SM : STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, APHA, AWWA, WEF, 23rd EDITION, 2017.
REGULATORY STANDARD : ANNOUNCEMENT OF THE DEPARTMENT OF HEALTH (THAILAND), PRACTICE FOR THE CONTROL OF LEGIONELLA
BACTERIA IN COOLING TOWERS, JANUARY 2001.
ND : NON-DETECTABLE.

LABORATORY SUPERVISOR

JANUARY 12, 2024

