

ภาคผนวก ข

ผลการตรวจวัดคุณภาพน้ำทิ้ง

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**NCH (THAILAND) CO., LTD**  
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Company :	Shangri La Hotel Ching Mai	Date :	5/01/2564
Address :	89/2 Chang Klan Road, Muang,Chiang Mai	Rep :	Attanee Chumnanlop
Contact Person :	Mr.Chalerm Proka	Rep Phone :	061-795-8080
Contact Phone :	(053) -253888	Service Tech. :	Pongsakorn
Contact Fax :	(053) 253800	Service Tech Phone :	064 - 730 2151

Waste Water Analysis																
SAMPLE IDENTIFICATION	pH	Conductivity	BOD5	Suspended Solid	Total Phosphorus	Total Kjedahl Nitrogen	Oil and Grease	Sulfide	Dissolve Oxygen	MLSS	MLVSS	SVL30	TDS	Total Coliform Bacteria	Fecal Coliform Bacteria	Free Chlorine
			(us/cm)	(mg/l)	(mg/l)	(ppm )	(mg/l)	(mg/l)	(ppm )	(ppm )	(ppm )	(ppm )	(mg/l)	(MPN/100 ml)	(MPN/100 ml)	(ppm )
Influent	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aeration	7.42	670	-	-	-	-	-	-	1.11	Not Analysis	-	10	-	-	-	-
Effluent	7.39	626	10.40	15.30	Not Analysis	< 10	2.00	0.46	-	-	-	-	344	35	24	0.01
Control limit Aeration	6.0 - 8.0	-	-	8.5 - 10.5	< 40	-	-	-	1.5 - 4.0	1000-3000	800-1500	100 - 300	-	-	-	-
Control limit Effluent	6.0 - 8.0	< 3500	< 20	< 30	-	< 35	< 20	< 1	-	-	-	-	-	< 5000	< 1000	< 1

Starndard : ประกาศกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม เรื่อง กำหนดมาตรฐานควบคุม การระบายน้ำทิ้งจากอาคารบางประเภท และบางขนาด 2548

BOD : N : P	RATIO	BOD	N	P
	Target	100	5	1
	Current	-	-	Not Analysis
F/M Ratio _ [Q*BOD/MLSS*AerationTank]	Target	0.2 - 0.5		
	Current	-		

SYSTEM STATUS: & ACTION REQUIRED

SYSTEM STATUS:	
Influent :	Not Sampling , Next Sampling in march 2021
Aeration :	pH level is Stable , DO level in control , SV30 = 10 , Treatment at EQ Tank , water colorless
Effluent :	WasteWater brown color, have sludge, BOD and Grease & Oil in control , pH in control level
Fecal Coliform & Total Coliform in contol limit , found very low Residual Chlorine in effulent water 0.01 ppm	

Action Required :

1. Now we have low loading waste water , Its difficult to maintain food for bacteria , NCH suggest to increase detention time for increase the waste water treatment performance and return bacteria sludge to aeration for maintain bacteira population in system

2. Now SLCM running treatment at EQ tank , NCH will dosing Free Flow Bacteria 1 box in EQ tank for increase bacteria population

Chemical	L,Kg	per	wk,mth	water	Control	Pump Settings	Stock	Remark
Bioamp	1 Box	per	MTH	Auto	Auto	Auto	Auto	Stop Service [ Dhala kitchen ]
Chlorine	-	per	-	-	50 ppm	-	-	Use Pump Control
-	-	per	-	-	-	-	-	-
-	-	per	-	-	-	-	-	-
-	-	per	-	-	-	-	-	-

Customer

Attanee Chumnanlop

Technical Sales Engineer

Chem-Aqua Division,NCH (Thailand) CO.LTD.



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Company :	Shangri La Hotel Ching Mai	Date :	3/02/2564
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Waste Water Analysis																
SAMPLE IDENTIFICATION	pH	Conductivity	BOD5	Suspended Solid	Total Phosphorus	Total Kjedahl Nitrogen	Oil and Grease	Sulfide	Dissolve Oxygen	MLSS	MLVSS	SVL30	TDS	Total Coliform Bacteria	Fecal Coliform Bacteria	Free Chlorine
			(us/cm)	(mg/l)	(mg/l)	(ppm)	(mg/l)	(mg/l)	(ppm)	(ppm)	(ppm)	(ppm)	(mg/l)	(MPN/100 ml)	(MPN/100 ml)	(ppm)
Influent	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aeration	7.50	699	-	-	-	-	-	-	1.11	Not Analysis	-	10	-	-	-	-
Effluent	7.54	716	18.70	23.40	Not Analysis	31.90	3.00	0.93	-	-	-	-	350	3,100	1,600	0.02
Control limit Aeration	6.0 - 8.0	-	-	8.5 - 10.5	< 40	-	-	-	1.5 - 4.0	1000-3000	800-1500	100 - 300	-	-	-	-
Control limit Effluent	6.0 - 8.0	< 3500	< 20	< 30	-	< 35	< 20	< 1	-	-	-	-	-	< 5000	< 1000	< 1

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BOD : N : P	RATIO	BOD	N	P
	Target	100	5	1
	Current	-	-	Not Analysis
F/M Ratio _ [Q*BOD/MLSS*AerationTank]	Target	0.2 - 0.5		
	Current	-		

SYSTEM STATUS: & ACTION REQUIRED

SYSTEM STATUS:	
Influent :	Not Sampling , Next Sampling in march 2021
Aeration :	pH level is Stable , DO level in control , SV30 = 10 , Treatment at EQ Tank , water light brown
Effluent :	WasteWater light gray color, have sludge, BOD and Grease & Oil in control , pH in control level
Fecal Coliform over control limit , Total Coliform in contol limit , found very low Residual Chlorine in effluent water 0.02 ppm	
Action Required :	
1. Now we have low loading waste water , Its difficult to maintain food for bacteria , NCH suggest to increase detention time for increase the waste water treatment performance and return bacteria sludge to aeration for maintain bacteira population in system	
2. NCH will check Chlorination system and calculation chemical stoke for balance chlorine residual in effluent water	

Chemical	L,Kg	per	wk,mth	water	Control	Pump Settings	Stock	Remark
Bioamp	1 Box	per	MTH	Auto	Auto	Auto	Auto	Stop Service [ Dhala kitchen ]
Chlorine	-	per	-	-	50 ppm	-	-	NCH will Check in Feb 21
-	-	per	-	-	-	-	-	-
-	-	per	-	-	-	-	-	-
-	-	per	-	-	-	-	-	-

Customer

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Technical Sales Engineer

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Company :	Shangri La Hotel Ching Mai	Date :	17/03/2564
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Waste Water Analysis																
SAMPLE IDENTIFICATION	pH	Conductivity	BOD5	Suspended Solid	Total Phosphorus	Total Kjedahl Nitrogen	Oil and Grease	Sulfide	Dissolve Oxygen	MLSS	MLVSS	SVL30	TDS	Total Coliform Bacteria	Fecal Coliform Bacteria	Free Chlorine
			(us/cm)	(mg/l)	(mg/l)	(ppm )	(mg/l)	(mg/l)	(ppm )	(ppm )	(ppm )	(ppm )	(mg/l)	(MPN/100 ml)	(MPN/100 ml)	(ppm )
Influent	6.55	707	419.00	154.00	-	30.00	2.75	5.99	-	-	-	-	494	> 160000	> 160000	-
Aeration	7.20	678	-	-	-	-	-	-	0.66	Not Analysis	-	< 20	-	-	-	-
Effluent	7.31	557	24.20	36.00	Not Analysis	16.00	2.00	1.03	-	-	-	-	247	6,000	3,600	0.01
Control limit Aeration	6.0 - 8.0	-	-	8.5 - 10.5	< 40	-	-	-	1.5 - 4.0	1000-3000	800-1500	100 - 300	-	-	-	-
Control limit Effluent	6.0 - 8.0	< 3500	< 20	< 30	-	< 35	< 20	< 1	-	-	-	-	-	< 5000	< 1000	< 1

Starndard : ประกาศกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม เรื่อง กำหนดมาตรฐานควบคุม การระบายน้ำทิ้งจากอาคารบางประเภท และบางขนาด 2548

BOD : N : P	RATIO	BOD	N	P
	Target	100	5	1
	Current	-	-	Not Analysis
F/M Ratio _ [Q*BOD/MLSS*AerationTank]	Target	0.2 - 0.5		
	Current	-		

SYSTEM STATUS: & ACTION REQUIRED

<b>SYSTEM STATUS:</b>	
Influent :	Waste Water is black color , don't have sludge , BOD loading double increase form last 3 month (December 2019 = 176.34 , March 2021 419.00 )
Aeration :	pH level is Stable , DO level in decrease , SV30 = < 20 , Treatment at EQ Tank , water light gray
Effluent :	WasteWater light gray color, have few sludge, BOD and SS out of control but Grease & Oil in control , pH in control level
Fecal Coliform & Total Coliform over contol limit , Need to increase chlorine dosing for increase Residual Chlorine in effulent water	
<b>Action Required :</b>	
1. We need to increase Detention time and DO in Aeration for increase our treatment performance by switch to treatment at Aeration tank 1 channel [250 Q/D] because this month we have High BOD loading and need more time and oxygen for control. If we running treatment at aeration tank at least 2 - 3 week , its will easier to control bacteria population morethan EQ tank	
2. NCH will check Chlorination system and Feed Free Flow bacteria to Aeration system 2 box in Apr 2021	

Chemical	L,Kg	per	wk,mth	water	Control	Pump Settings	Stock	Remark
Bioamp	1 Box	per	MTH	Auto	Auto	Auto	Auto	Stop Service [ Dhala kitchen ]
Chlorine	-	per	-	-	50 ppm	-	-	NCH will Check in Apr 21
-	-	per	-	-	-	-	-	-
-	-	per	-	-	-	-	-	-
-	-	per	-	-	-	-	-	-

Customer

Attanee Chumnanlop

Technical Sales Engineer

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Company :	Shangri La Hotel Ching Mai	Date :	20/04/2564
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Contact Fax :	(053) 253800	Service Tech Phone :	064 - 730 2151

Waste Water Analysis																
SAMPLE IDENTIFICATION	pH	Conductivity	BOD5	Suspended Solid	Total Phosphorus	Total Kjedadhl Nitrogen	Oil and Grease	Sulfide	Dissolve Oxygen	MLSS	MLVSS	SVL30	TDS	Total Coliform Bacteria	Fecal Coliform Bacteria	Free Chlorine
			(us/cm)	(mg/l)	(mg/l)	(ppm)	(mg/l)	(mg/l)	(ppm)	(ppm)	(ppm)	(ppm)	(mg/l)	(MPN/100 ml)	(MPN/100 ml)	(ppm)
Influent	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aeration	7.50	623	-	-	-	-	-	-	0.89	Not Analysis	-	< 20	-	-	-	-
Effluent	7.38	572	20.20	36.00	Not Analysis	19.00	< 2	1.20	-	-	-	-	258	6,000	920	0.00
Control limit Aeration	6.0 - 8.0	-	-	8.5 - 10.5	< 40	-	-	-	1.5 - 4.0	1000-3000	800-1500	100 - 300	-	-	-	-
Control limit Effluent	6.0 - 8.0	< 3500	< 20	< 30	-	< 35	< 20	< 1	-	-	-	-	-	< 5000	< 1000	< 1

Starndard : ประกาศกระทรวงทรัพยากรธรรมชาติและสิ่งแวดล้อม เรื่อง กำหนดมาตรฐานควบคุม การระบายน้ำทิ้งจากอาคารบางประเภท และบางขนาด 2548

BOD : N : P	RATIO	BOD	N	P
	Target	100	5	1
	Current	-	-	Not Analysis
F/M Ratio _ [Q*BOD/MLSS*AerationTank]	Target	0.2 - 0.5		
	Current	-		

SYSTEM STATUS: & ACTION REQUIRED

SYSTEM STATUS:	
Influent :	Not Sampling - Sampling again in June 2021
Aeration :	pH level is Stable , DO level in decrease , SV30 = < 20 , Treatment at Aeration Tank first - Second Week and Then Change to EQ in Last Week of Apr 21, water light gray color
Effluent :	Waste Water has hard gray color, have few sludge, BOD and SS out of control but Grease & Oil in control , pH in control level
Fecal Coliform & Total Coliform over contol limit , Need to increase chlorine dosing for increase Residual Chlorine in effulent water	
Action Required :	
1. We need to increase Detention time and DO in Aeration for increase our treatment performance by switch to treatment at Aeration tank 1 channel [250 Q/D] because this month we have High BOD loading and need more time and oxygen for control. If we running treatment at aeration tank at least 2 - 3 week , its will easier to control bacteria population morethan EQ tank	
2. NCH will check Chlorination system wiitn SLCM Staff for follow up , Now our Bacteria already dose in Aeration tank need to open Air pump at least 4 - 6 hour / day	

Chemical	L,Kg	per	wk,mth	water	Control	Pump Settings	Stock	Remark
Bioamp	1 Box	per	MTH	Auto	Auto	Auto	Auto	Stop Service [ Dhala kitchen ]
Chlorine	-	per	-	-	50 ppm	-	-	NCH will follow up
-	-	per	-	-	-	-	-	-
-	-	per	-	-	-	-	-	-
-	-	per	-	-	-	-	-	-

Customer

Attanee Chumnanlop  
Technical Sales Engineer  
Chem-Aqua Division,NCH (Thailand) CO.LTD.



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Waste Water Analysis																
SAMPLE IDENTIFICATION	pH	Conductivity	BOD5	Suspended Solid	Total Phosphorus	Total Kjedahl Nitrogen	Oil and Grease	Sulfide	Dissolve Oxygen	MLSS	MLVSS	SVL30	TDS	Total Coliform Bacteria	Fecal Coliform Bacteria	Free Chlorine
			(us/cm)	(mg/l)	(mg/l)	(ppm)	(mg/l)	(mg/l)	(ppm)	(ppm)	(ppm)	(ppm)	(mg/l)	(MPN/100 ml)	(MPN/100 ml)	(ppm)
Influent	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aeration	7.50	729	-	-	-	-	-	-	0.26	Not Analysis	-	< 20	-	-	-	-
Effluent	7.59	775	18.08	33.00	Not Analysis	28.00	4.50	1.00	-	-	-	-	362	35,000	11,000	0.00
Control limit Aeration	6.0 - 8.0	-	-	8.5 - 10.5	< 40	-	-	-	1.5 - 4.0	1000-3000	800-1500	100 - 300	-	-	-	-
Control limit Effluent	6.0 - 8.0	< 3500	< 20	< 30	-	< 35	< 20	< 1	-	-	-	-	-	< 5000	< 1000	< 1

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BOD : N : P	RATIO	BOD	N	P
	Target	100	5	1
	Current	-	-	Not Analysis
F/M Ratio _ [Q*BOD/MLSS*AerationTank]	Target	0.2 - 0.5		
	Current	-		

SYSTEM STATUS: & ACTION REQUIRED

<b>SYSTEM STATUS:</b>	
Influent :	Not Sampling - Sampling again in June 2021
Aeration :	pH level is Stable , DO level in decrease , SV30 = < 20 ,Now we are treatment at EQ tank , water light gray color
Effluent :	Waste Water has gray color, have few sludge, BOD , Grease & Oil and pH in control limit , SS out of control
Fecal Coliform & Total Coliform over contol limit , Need to increase chlorine dosing for increase Residual Chlorine in effulent water	
<b>Action Required :</b>	
1. We need to increase Detention time and DO in Aeration for increase our treatment performance by switch to treatment at Aeration tank 1 channel [250 Q/D] because this month we have High BOD loading and need more time and oxygen for control. If we running treatment at aeration tank at least 2 - 3 week , its will easier to control bacteria population morethan EQ tank	
2. NCH will check Chlorination system wiitn SLCM Staff for follow up , Now our Bacteria already dose in Aeration tank need to open Air pump at least 4 - 6 hour / day	

Chemical	L,Kg	per	wk,mth	water	Control	Pump Settings	Stock	Remark
Bioamp	1 Box	per	MTH	Auto	Auto	Auto	Auto	Stop Service [ Dhala kitchen ]
Chlorine	-	per	-	-	50 ppm	-	-	NCH will follow up
-	-	per	-	-	-	-	-	-
-	-	per	-	-	-	-	-	-
-	-	per	-	-	-	-	-	-

Customer

Attanee Chumnanlop  
Technical Sales Engineer  
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Waste Water Analysis																
SAMPLE IDENTIFICATION	pH	Conductivity	BOD5	Suspended Solid	Total Phosphorus	Total Kjedadhl Nitrogen	Oil and Grease	Sulfide	Dissolve Oxygen	MLSS	MLVSS	SVL30	TDS	Total Coliform Bacteria	Fecal Coliform Bacteria	Free Chlorine
			(us/cm)	(mg/l)	(mg/l)	(ppm)	(mg/l)	(mg/l)	(ppm)	(ppm)	(ppm)	(ppm)	(mg/l)	(MPN/100 ml)	(MPN/100 ml)	(ppm)
Influent	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aeration	7.10	746	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Effluent	7.41	494	12.00	69.30	Not Analysis	14.90	3.75	0.80	-	-	-	-	315	> 16000	> 16000	0.00
Control limit Aeration	6.0 - 8.0	-	-	8.5 - 10.5	< 40	-	-	-	1.5 - 4.0	1000-3000	800-1500	100 - 300	-	-	-	-
Control limit Effluent	6.0 - 8.0	< 3500	< 20	< 30	-	< 35	< 20	< 1	-	-	-	-	-	< 5000	< 1000	< 1

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BOD : N : P	RATIO	BOD	N	P
	Target	100	5	1
	Current	-	-	Not Analysis
F/M Ratio _ [Q*BOD/MLSS*AerationTank]	Target	0.2 - 0.5		
	Current	-		

SYSTEM STATUS: & ACTION REQUIRED

SYSTEM STATUS:	
Influent :	Not Sampling - Postpone sampling to July 2021
Aeration :	pH level is Stable , DO level in decrease , SV30 = < 10 , Now we are treatment at EQ tank , water light yellow color
Effluent :	Waste Water has light yellow color, have few sludge, BOD , Grease & Oil and pH in control limit , SS out of control
Fecal Coliform & Total Coliform over contol limit , Need to increase chlorine dosing for increase Residual Chlorine in effulent water	
Action Required :	
1. We clean sedimentation tank for increase capacity of system and move some sludge to EQ tank for forming bacteria by return sludge puump	
2. For EQ tank now we change to aeration tank , we need to maintain Disslove oxygen and Bacteria [SV30 >200] for control performance , NCH will fill Free Flow Bacteria and check sludge volume	
3. NCH will check Chlorination system witi SLCM Staff for follow up , Now our Bacteria already dose in Aeration tank need to open Air pump at least 4 - 6 hour / day	

Chemical	L,Kg	per	wk,mth	water	Control	Pump Settings	Stock	Remark
Bioamp	1 Box	per	MTH	Auto	Auto	Auto	Auto	Stop Service [ Dhala kitchen ]
Chlorine	-	per	-	-	50 ppm	-	-	NCH will follow up
-	-	per	-	-	-	-	-	-
-	-	per	-	-	-	-	-	-
-	-	per	-	-	-	-	-	-

Customer

Attanee Chumnanlop

Technical Sales Engineer

Chem-Aqua Division,NCH (Thailand) CO.LTD.