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TEST REPORT

DRAINAGE SERVICES DEPARTMENT

**CONTRACT NO. DC/2006/15 BUILDING AND
CIVIL MAINTENANCE AND MINOR WORKS OF
DSD PLANTS AND FACILITIES (2007-2009)**

**GROUNDWATER MONITORING AT
NGONG PING STW AND EFFLUENT EXPORT
PIPE**

MONTHLY EM&A REPORT

(SEPTEMBER 2007)

Prepared by:

LAW, Sau Yee
Senior Environmental Officer

Checked and
Approved by:

LAU, Chi Leung
Environmental Team Leader

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Our Ref.: DSDSTPOPEM00_0_0096

Date: 15 October 2007

Consultants Management Division
Drainage Services Department
42/F., Revenue Tower,
5 Gloucester Road, Wan Chai,
Hong Kong

By mail and by Fax (2827 8526)

Attention : Mr. Mok Wing Cheong, Ringo

Dear Mr. Mok,

Re: Environmental Permit 157/2003/A
Contract No: DC/2006/15 Building and Civil Maintenance and Minor Works of DSD
Plants and Facilities
Monthly EM&A Report of Ground Water Monitoring for September 2007

Reference is made to the monthly EM&A Report prepared by ETS for the captioned project (report no. ENA70990). We are pleased to verify that the captioned report complied with the conditions 5.4 and 6.1 of the Environmental Permit.

Thank you very much for your attention and please feel free to contact the undersigned or our Mr. Roy Leung if you have any queries.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Connie Wong', written over a faint circular stamp.

Connie Wong
Independent Environmental Checker

c.c. Mr. Edwin Lam CE/HKI, DSD
Mr. CL Lau ETS

By Fax: 2827 6657
By Fax: 2695 3944



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EXECUTIVE SUMMARY

This monthly EM&A report (No.2) has been prepared by the Environmental Team (ET) of ETS-Testconsult Ltd for groundwater monitoring under "Contract No. DC/2006/15 Building and Civil Maintenance and Minor Works to DSD Plants and Facilities (2007-2009) – Groundwater Monitoring at Ngong Ping STW and Effluent Export Pipeline" (the Project) during the operation period from 01 to 30 September 2007.

Under the requirements of Section 5 of "the Environmental Permit (No. EP-157/2003/A)" (the EP), EM&A programme as set out in the EM&A Manual and the EIA Report (Register No.: AEIAR-065/2002) is required to be implemented. In accordance with the EM&A manual and the EIA Report, groundwater monitoring is required for the Project during operation phase

Environmental Monitoring Progress

The summary of the monitoring activities in this monitoring month is listed below:

- *Groundwater Monitoring: 1 Occasion at 9 designated boreholes.*

Groundwater Monitoring

Groundwater monitoring was carried out on 14 September 2007. During this monitoring, ground water was found in Borehole WM3 and the other boreholes were dry.

Test results of the groundwater during this monitoring show no contamination of ground water by any treated effluent. In other words, it is evident that there was no leakage of treated effluent from the Ngong Ping Sewage Treatment Works or its effluent export pipeline into the water gathering ground.

Environmental Complaints

No complaints were received in this reporting month.

Notification of summons and successful prosecutions

There were no notification of summons and prosecutions with respect to environmental issues in this month.

Future Key Issues

Future Key issues to be considered for the prevention of contamination of the water gathering ground are as follows:

- The provision of leakage containment system for the section of pipeline in the close proximity of the reservoir;
- Removing waste in a timely manner and disposing of outside the water gathering ground;
- Locating the chemical storage area at a safe environment with adequate space; and
- Reminding the workers not to discharge any sewage or wastewater into the nearby environment.



1.0 INTRODUCTION

The construction works of Ngong Ping Sewage Treatment Works (NPSTW) was certificated completed on 09 March 2006 and the NPSTW was handed over to "Drainage Sewage Department" (DSD) for operation and maintenance from 10 March 2006. "ETS-Testconsult Limited" (ETL) has been commissioned as Environmental Team (ET) to carry out groundwater monitoring at Ngong Ping according to the EM&A Manual.

This monthly EM&A report presents the results of groundwater monitoring during the reporting period from 01 to 30 September 2007.

2.0 PROJECT INFORMATION

2.1 Background

Master Plan (OI SMP) Study in December 1994 and drew up a SMP for Lantau Island, Cheung Chau, Lamma Island, Peng Chau and other smaller and less populated islands. The SMP comprises provisions for upgrading and expanding the sewerage systems to cover unsewered areas.

This sewerage project is the Stage 1 works under the OI SMP and can be divided into 3 packages as follows:

Package 1 – Ngong Ping STW with tertiary treatment

Package 2 – Ngong Ping main trunk sewer and effluent export pipeline

Package 3 – Ngong Ping village sewerage system

This Project only covers the operation phase of Package 1 and Package 2. The general layout plan of the project is shown in Appendix D (Drawing No. 23400/EN/098).

The existing treatment facilities at Ngong Ping include grease traps and septic tanks, with discharge locally to soakaways. Following the opening of the Statue of Buddha in December 1993, the number of visitors to Ngong Ping increased significantly. Besides, the Cable Car system linking Tung Chung and Ngong Ping was being planned for commissioning in June 2006. It will certainly further increase the number of visitors in Ngong Ping. The existing treatment and disposal facilities were found to be inadequate, with significant quantities of sewage being directly discharged into the local stream. It was under this setting that the recommendation to provide a local sewerage system and a centralised treatment system for Ngong Ping was put forward in the OI SMP in 1994.

The Project was planned, designed, operated and maintained by the DSD. During the operation phase of NPSTW, DSD will follow the environmental monitoring recommendation stated at the M&A Manual that was prepared with reference to the EIA Report (Register No.: AEIAR-065/2002) to avoid the contamination of the water gathering ground.

2.2 Site Description

The general layout plan of the project is shown in Appendix D. The groundwater monitoring locations are also shown in the Drawing No. 23400/T/202, 23400/T/074, 23400/T/075 and 23400/T/076.

2.3 Project Organization and Management Structure

The line of communication of project organization with respect to the on-site environmental management and monitoring program are shown in Appendix A.



2.4 Contact Details of Key Personnel

The key personnel contact names and telephone numbers, and construction programme are shown in table 2.1.

Table 2.1 Contact Details of Key Personnel

Organization	Project Role	Name of Key Staff	Tel. No.	Fax No.
DSD	Contractor	Mr. P C Wu	2594 7199	2827 6657
CH2M HILL	Independent Environmental Checker	Mr. Billy Yu	2507 2203	2507 2293
ETL	Contractor's Environmental Team	Mr. C L Lau (ET Leader)	2946 7791	2695 3944

3.0 GROUNDWATER QUALITY MONITORING

3.1 Monitoring Locations

Groundwater quality monitoring was undertaken at nine designated boreholes shown in Table 3.1.

Table 3.1 Locations of Groundwater Quality Monitoring

Borehole No.	Depth from Ground Level to end of standpipe (m)	Location
WM1	3.58	Keung Shan Road (L/P FA0463)
WM2	4.24	Keung Shan Road (L/P FA0458)
WM3	3.57	Keung Shan Road (L/P FA0445)
WM4	2.77	Keung Shan Road (L/P FA0437)
WM5	4.63	Keung Shan Road (L/P FA0428)
WM6	10.46	STP (Ngong Ping)
WM7	9.68	STP (Ngong Ping)
WM8	9.99	STP (Ngong Ping)
WM9	10.69	STP (Ngong Ping)

3.2 Monitoring Parameters

Monitoring of the groundwater monitoring parameters are listed below:

- Biochemical Oxygen Demand (BOD₅), mg/L;
- Ammonia Nitrogen (NH₄⁺-N), mg/L;
- Nitrate + Nitrite Nitrogen (NO₂⁻+NO₃⁻), mg/L;
- pH value;
- Turbidity, NTU;
- Oil & Grease (O&G), mg/L;
- Total Phosphates (TP), mg/L;
- Synthetic detergents, mg/L;
- E-coli, cfu/100ml.

3.3 Monitoring Frequency

The monitoring frequency of the groundwater monitoring is summarized in Table 3.3.

Table 3.3 The frequency of the Groundwater Monitoring

<i>Parameter</i>	<i>Frequency</i>	<i>No. of Boreholes</i>
<i>Biochemical Oxygen Demand</i>	<i>Once per month</i>	<i>9</i>
<i>Ammonia Nitrogen</i>		
<i>Nitrate + Nitrite</i>		
<i>pH value</i>		
<i>Turbidity</i>		
<i>Oil & Grease</i>		
<i>Total Phosphates</i>		
<i>Synthetic detergents</i>		
<i>E-coli</i>		

3.4 Monitoring Methodology and Equipment Used

A water sampler comprising a transparent PVC cylinder, with a capacity of not less than 2 liters, was lowered into the water body at the predetermined depth. The opening ends of the sampler were then closed accordingly and water samples were collected.

The sample container, made by high-density polythene / glass, was rinsed with a portion of the water sample. The groundwater sample was then transferred to the container, labeled with a unique sample ID and sealed with a screw cap. The water samples were stored in a cool box maintained at 4°C. The groundwater samples were then delivered to a local HOKLAS-accredited laboratory (Environmental Laboratory, ETS-Testconsult Ltd, HOKLAS Registration No. 022) on the same day for analysis.

In accordance with the requirement of HOKLAS, the laboratory testing of the monitoring parameters were carried out with QA/QC results shown in Appendix E. The summary of testing methods of testing parameters as recommended by EIA or required by EPD were shown in Table 3.4.

Table 3.4 Summary of testing procedures

<i>Laboratory Analysis</i>	<i>Testing Procedure</i>	<i>Detection Limit</i>
<i>Biochemical Oxygen Demand</i>	<i>In house method TPE/001/W or BS 6068 : Section 2.14 : 1990</i>	<i>2.0 mg/L</i>
<i>Ammoniacal Nitrogen</i>	<i>In house method TPE/016/W, refer to APHA 19ed 4500-NH₃ F & G</i>	<i>0.13 mg/L</i>
<i>Nitrate + Nitrite</i>	<i>In house method TPE/023/W, refer to APHA 19ed 4500-NO₃ B</i>	<i>0.004 mg/L</i>
<i>pH (at 25°C)</i>	<i>In house method TPE/003/W, refer to APHA 19ed APHA 4500-H⁺ B</i>	<i>Detection range: 4.0-10.0</i>
<i>Turbidity</i>	<i>In house method TPE/005/W, refer to APHA 19ed 2130B</i>	<i>0.5 NTU</i>
<i>Oil & Grease</i>	<i>APHA 19ed 5520 B</i>	<i>5.0 m/L</i>
<i>Total Phosphate</i>	<i>In house method base on ASTM D 515-88</i>	<i>0.05 mg/L</i>
<i>Synthetic detergents</i>	<i>In house method based on APHA 19ed 5540 C & D</i>	<i>0.1 mg/L</i>
<i>E-coli</i>	<i>DoE Section 7.8 & 7.9 plus in-site urease test</i>	<i><1 cfu/100ml</i>



3.5 Groundwater Monitoring Results

In this reporting month, groundwater monitoring was carried out on 14 September 2007. During this monitoring, groundwater was found in Borehole No WM3 and the other boreholes were dry. The groundwater quality measurement results are detailed in Appendix B. Graphical presentation of the monitoring parameters for this reporting month is shown in Appendix C.

Test results of the groundwater during this monitoring show no contamination of ground water by any treated effluent. In other words, it is evident that there was no leakage of treated effluent from the Ngong Ping Sewage Treatment Works or its effluent export pipeline into the water gathering ground.

4.0 ENVIRONMENTAL NON-CONFORMANCE

4.1 Summary of Groundwater Quality Monitoring

According to the results of all testing parameters, they show no contamination of ground water by any treated effluent. In other words, it is evident that there was no leakage of treated effluent from the Ngong Ping Sewage Treatment Works or its effluent export pipeline into the water gathering ground.

4.2 Summary of Environmental Complaints

No complaints were received in this reporting month.

4.3 Summary of Notification of Summons and Prosecution

There was no notification of summons respect to environmental issues registered in this month.

5.0 IMPLEMENTATION STATUS

5.1 Implementation Status of Environmental Mitigation Measures

DSD has been implementing the required environmental mitigation measures indicating in Clause 4.5.20 of the EM&A manual.

5.2 Implementation Status of Environmental Complaint Handling

No complaints were received in this reporting month. The details of the complaint-log are presented in Table 5.1.

Table 5.1 Statistical Summary of Environmental Complaints

Reporting Month	Complaint Statistics			
	Frequency	Cumulative	Aspect	Investigation Results and Follow up Actions
August 07	0	0	---	---

5.3 Implementation Status of Notification of Summons and Prosecution

There were no notifications of summons respect to environmental issues registered in this reporting month.



6.0 CONCLUSION

In this reporting month, groundwater monitoring was carried out on 14 September 2007. During this monitoring, ground water was found in Borehole WM3 and the other boreholes were dry.

According to the results of all testing parameters, they show no contamination of ground water by any treated effluent. In other words, it is evident that there was no leakage of treated effluent from the Ngong Ping Sewage Treatment Works or its effluent export pipeline into the water gathering ground.

7.0 FUTURE KEY ISSUES

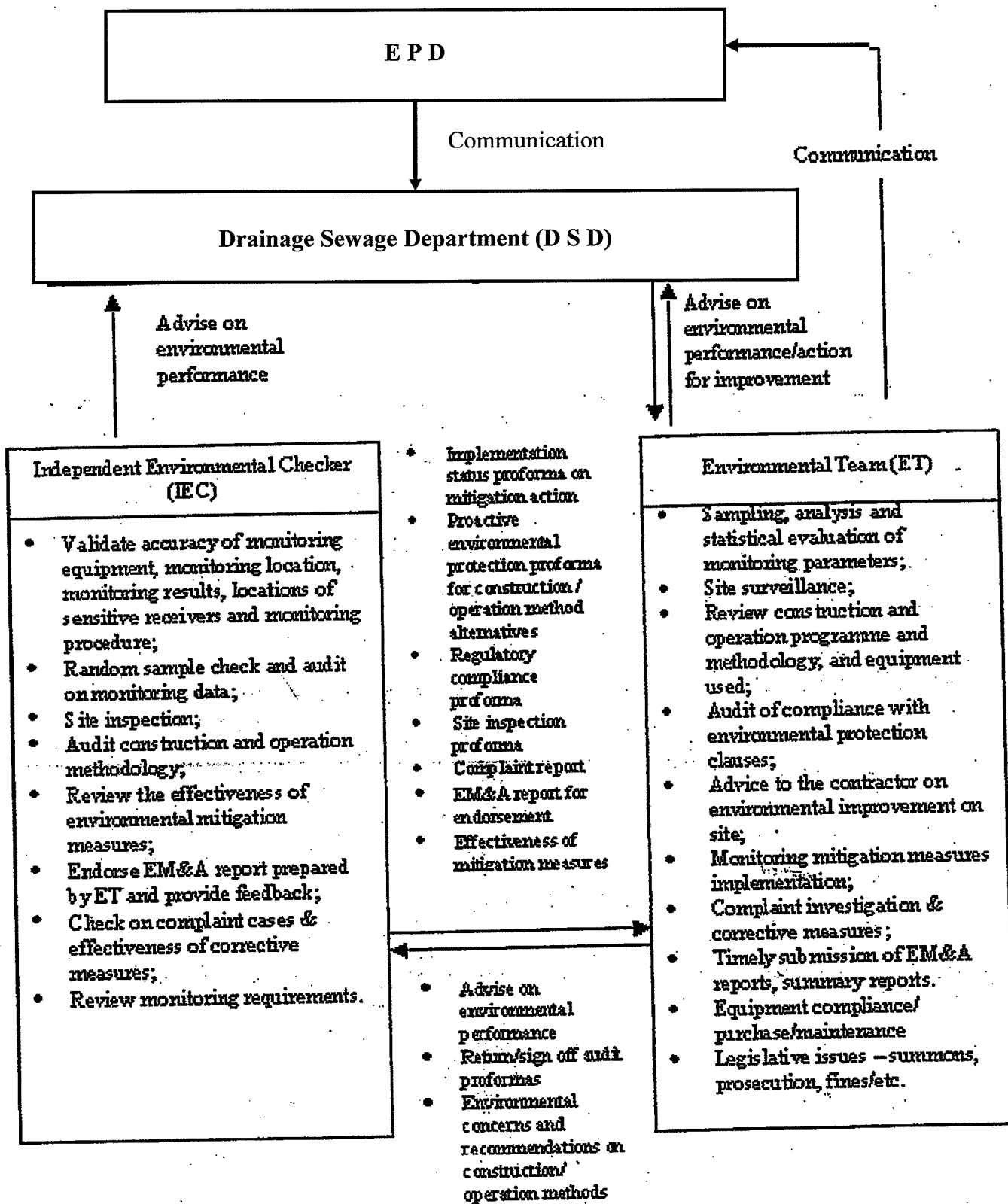
DSD will continue to carry out operation and maintenance works of NPSTW in the coming month. Future Key issues to be considered for the prevention of contamination of the water gathering ground are as follows:

- The provision of leakage containment system for the section of pipeline in the close proximity of the reservoir;
- Removing waste in a timely manner and disposing of outside the water gathering ground;
- Locating the chemical storage area at a safe environment with adequate space; and
- Reminding the workers not to discharge any sewage or wastewater into the nearby environment.



Appendix A

Lines of Communication



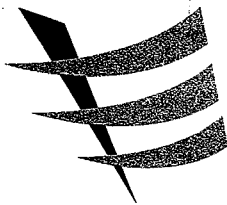


Appendix B

Groundwater Monitoring Results

and

Photos of Groundwater Monitoring at Boleholes



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TEST REPORT

Environmental Testing of Water & Wastewater

Report No. : ENA70991
Date of issue : 24 September 2007
Page No. : 1 of 1

Information provided by client

Client name : Welcome Construction Co Ltd
Client address : Flat 01, 19/F, Westley Square, 48 Hoi Yuen Road, Kwun Tong, Kowloon
Sample Source : DC/2006/15 - Building and Civil Maintenance and Minor Works to DSD Plants and Facilities (2007-2009)
Sample Type : Groundwater
Date of sampling : 14 September 2007
Sample Description : The sample was collected in 200ml glass bottle (for Total Phosphates only), 500ml glass bottle (for Oil & Grease only), 200ml sterilized glass bottle (for E-coli only), 500ml and 1L plastic bottles (for other testing parameters). Sample for Ammonia and Nitrate + Nitrite Nitrogen was preserved by adding conc. H₂SO₄ to pH<2. Sample for Oil & Grease was preserved by adding conc. HCl to pH<2. All samples were chilled immediately after collection.

Laboratory information

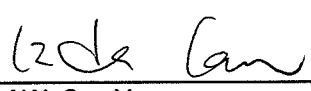
Date Received : 14 September 2007

Result

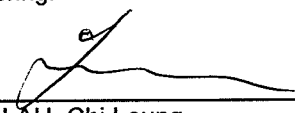
Client Sample ID	Lab Ref No	Test	Method Used	Result	Date Tested
WM3	W22223 (01)	pH Value	In house method TPE/003/W	5.9 (at 25°C)	14 September 2007
		Turbidity	In house method TPE/005/W	13 NTU	14 September 2007
		Biochemical Oxygen Demand (5-day)	In house method TPE/001/W	4.9 mg/L	14 September 2007 (18:00) to 19 September 2007 (18:00)
	W22223 (02)	Nitrate & Nitrite Nitrogen	In house method TPE/023/W	0.34 mg/L	18 September 2007
		Ammonia	In house method TPE/016/W	0.033 mg/L	15 September 2007
	W22223 (03)	Total Phosphates	In house method TPE/019/W	<0.1 mg/L	15 September 2007
	W22223 (04)	Oil & Grease	APHA 19ed 5520B	<5.0 mg/L	15 September 2007
	W22223 (05)	Synthetic Detergents	In house method refer to APHA 19th ed 5540 C & D	<0.1 mg/L	15 September 2007
W22223 (06)	E-coli *	DoE (1983), section 7.8 & 7.9 plus in-situ urease test	10 cfu/100ml	14 to 16 September 2007	

Remark (if any) : The tests marked with "*" indicated the tests were sub-contract to ALS Technichem (HK) Pty Ltd and HOKLAS accredited. Ground water monitoring was only carried out at Borehole WM3 only since other boreholes were observed to be dry during the monitoring.

Checked by :


LAW, Sau Yee
Senior Chemist

Approved by :


LAU, Chi Leung
Chief Chemist



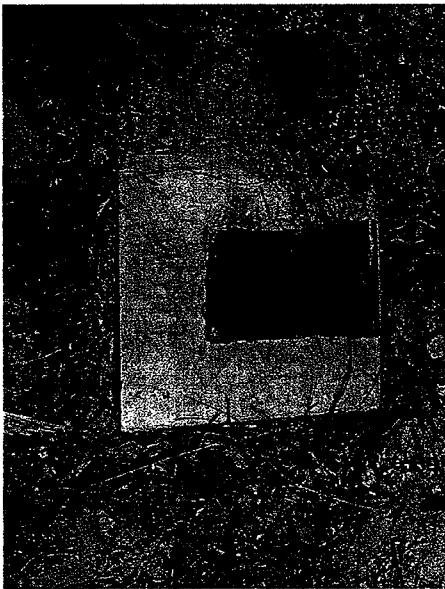
Project : DC/2006/15 - Building and Civil Maintenance and
Minor Works to DSD Plants and Facilities (2007-2009)

Date of sampling and photo taking : 14 September 2007

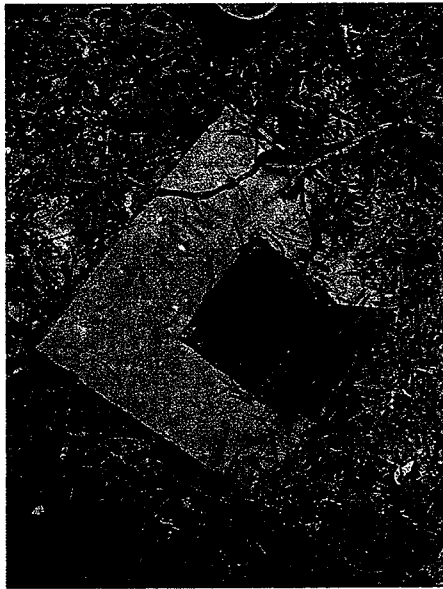
Report No. : ENA70991

Date of issue : 24 September 2007

WM1



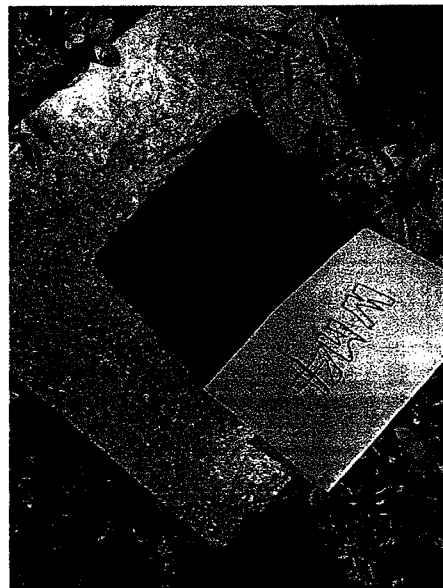
WM2



WM3



WM4





Project : DC/2006/15 - Building and Civil Maintenance and
Minor Works to DSD Plants and Facilities (2007-2009)
Date of sampling and photo taking : 14 September 2007
Report No. : ENA70991
Date of issue : 24 September 2007

WM5



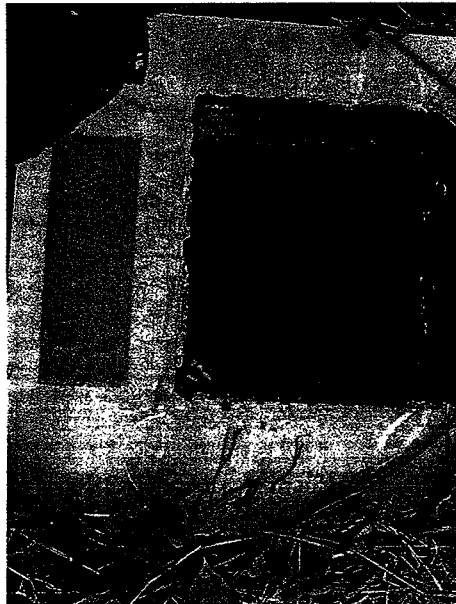
WM6



WM7



WM8





Project : DC/2006/15 - Building and Civil Maintenance and
Minor Works to DSD Plants and Facilities (2007-2009)
Date of sampling and photo taking : 14 September 2007
Report No. : ENA70991
Date of issue : 24 September 2007

WM9



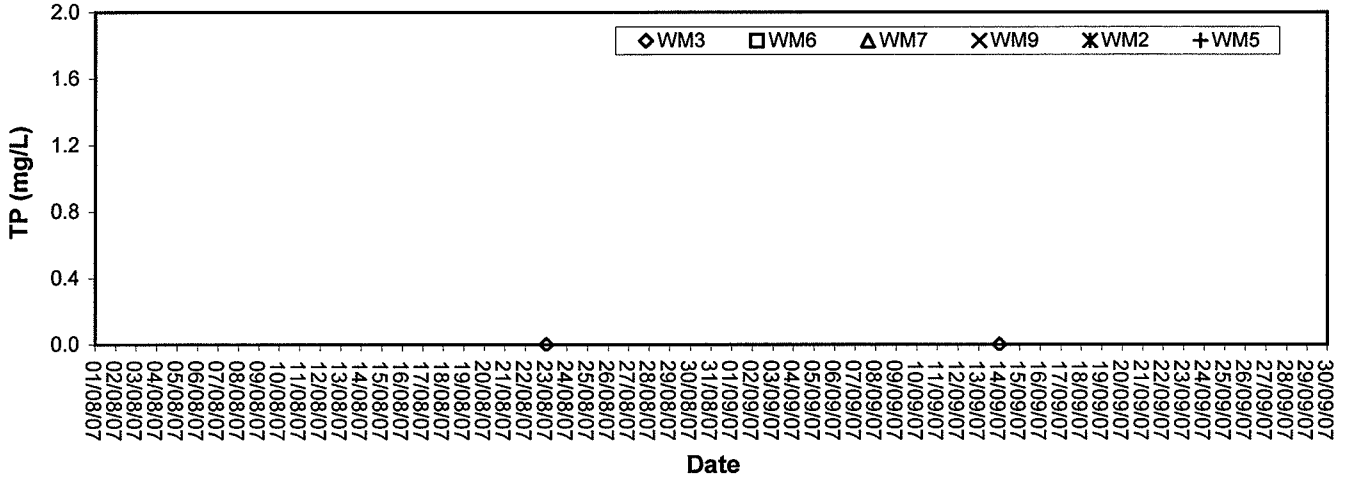


Appendix C

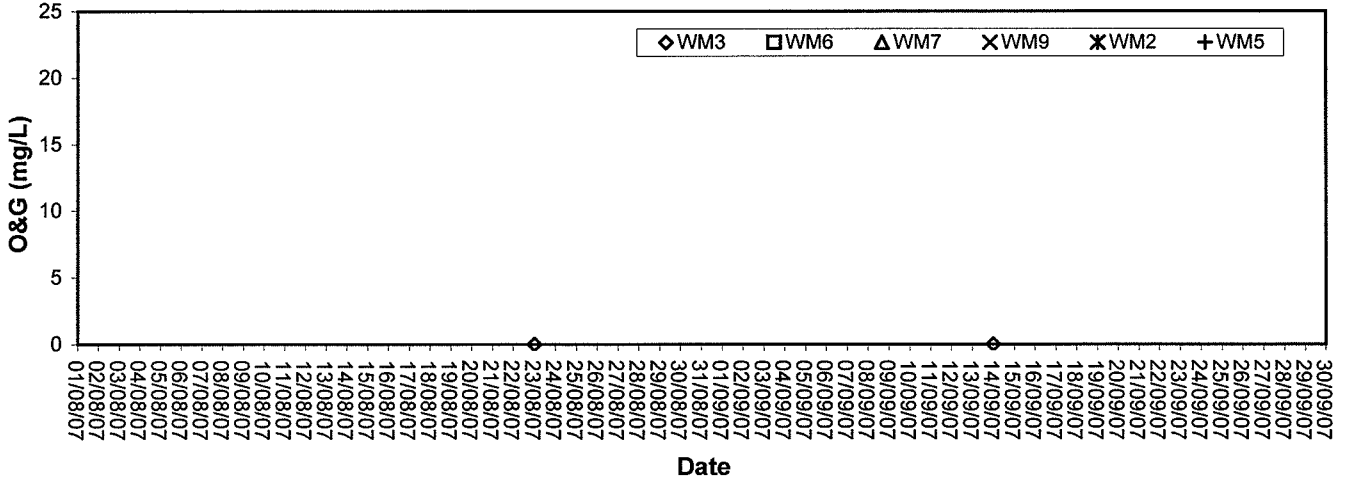
Graphical Plots of Groundwater Monitoring Data



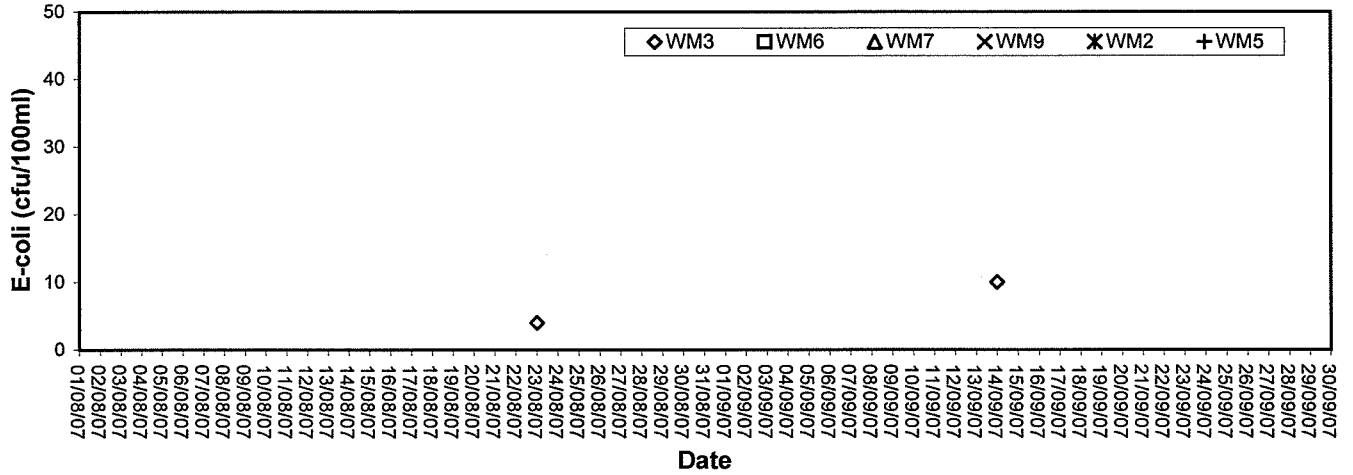
Total Phosphates (TP)



Oil & Grease (O&G)

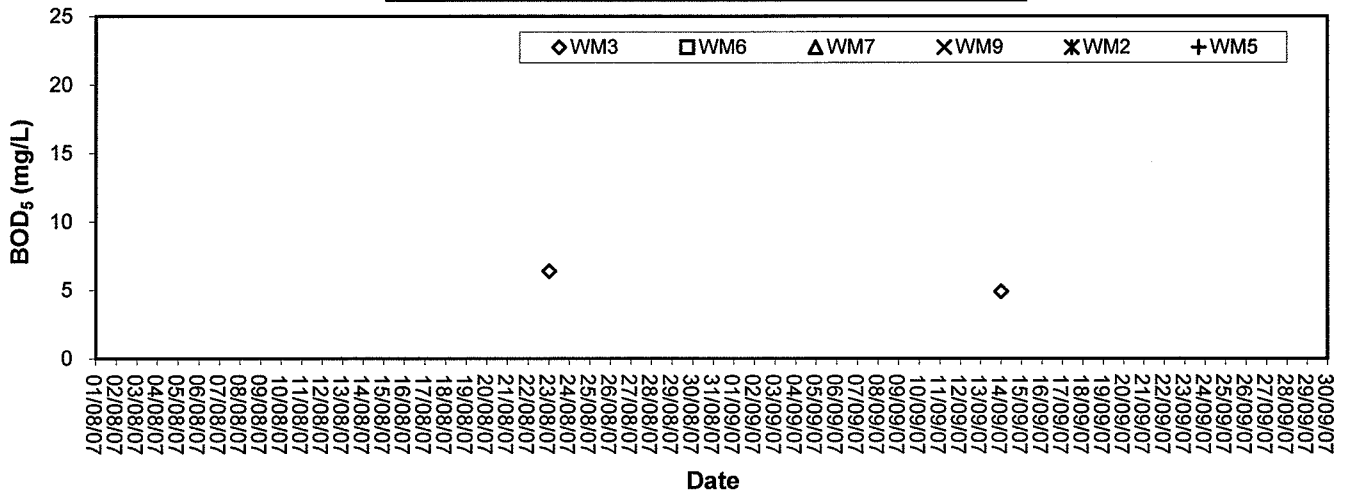


E-coli

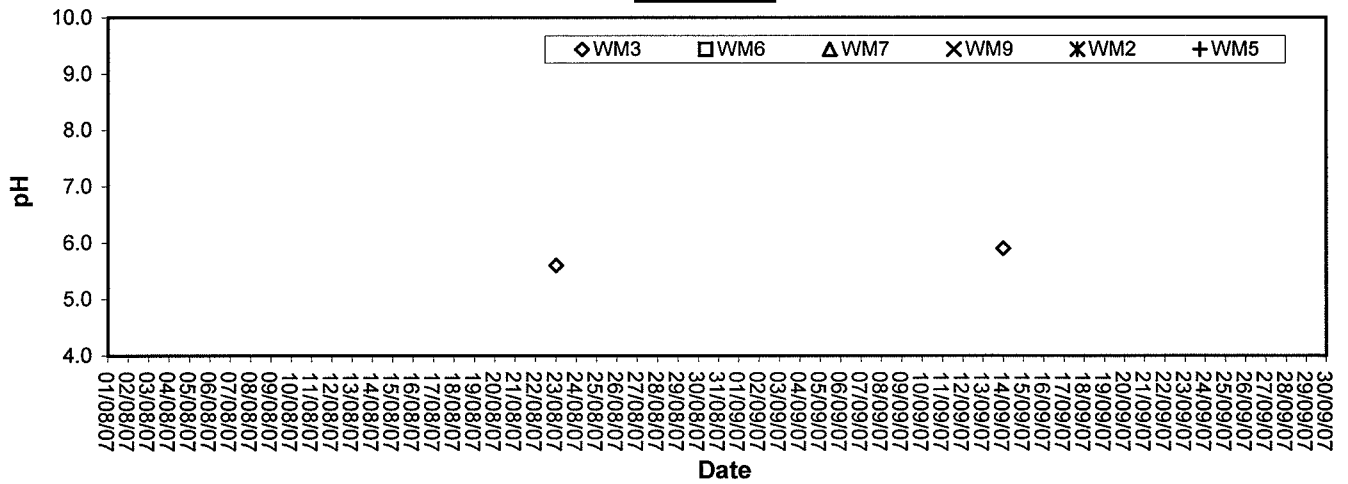




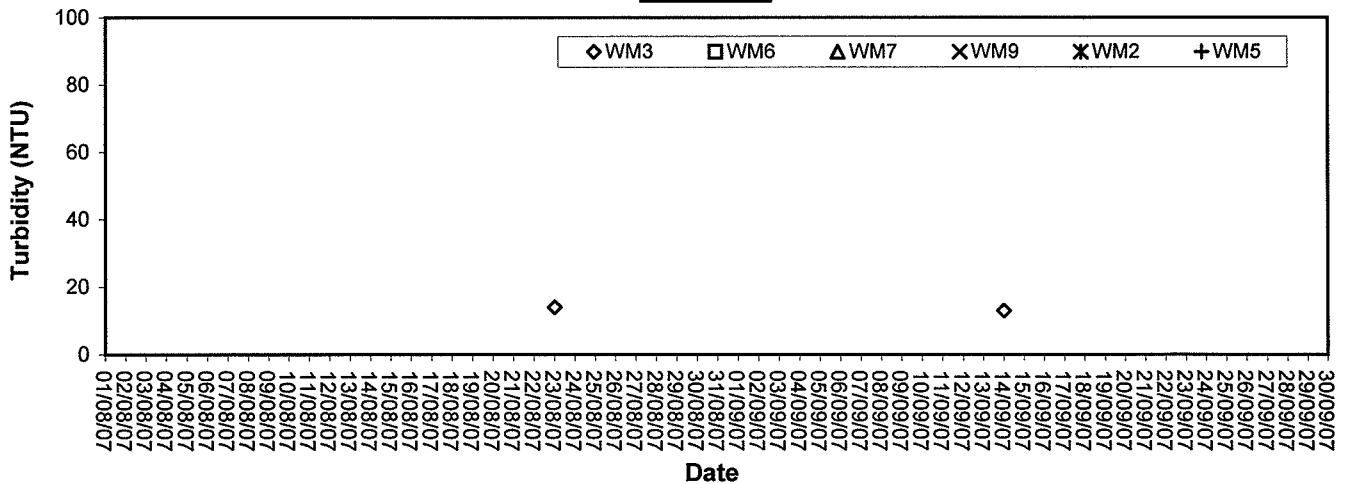
5-day Biochemical Oxygen Demand (BOD₅)



pH Value



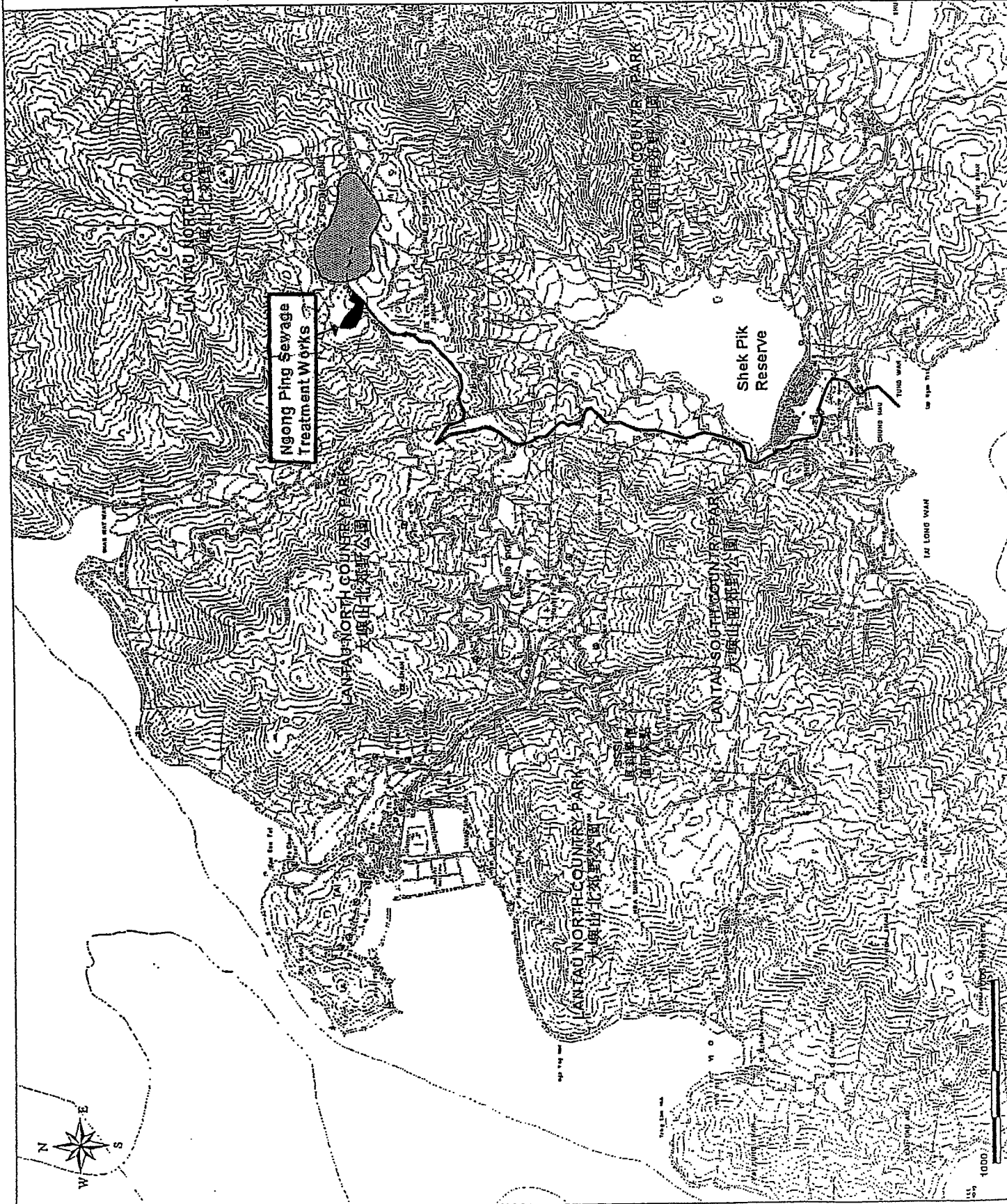
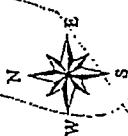
Turbidity








Appendix D

General Layout Plan



Legend:

-  Proposed Effluent Export Pipeline
-  Proposed Trunk Sewer of Ngong Ping Sewerage
-  Ngong Ping Sewerage Catchment Area

Project No.	
Client	
Scale	
Date	


ARUP

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Tel: +1 212 904 7000
Fax: +1 212 904 7001
www.arup.com

AGREEMENT NO CE 2801
OUTLYING ISLANDS SCHEMATIC PHASE 1
NGONG PING SEWERAGE TREATMENT
WORKS AND SEWERAGE

Ngong Ping Sewerage Project
Scheme - General Layout

Project No.	23400/EN/088
Client	AC
Date	Feb 03
Scale	1:2000@A3
Phase	Preliminary



香港特別行政區政府
THE HONG KONG GOVERNMENT
SPECIAL ADMINISTRATIVE REGION





Appendix E

QA/QC Results



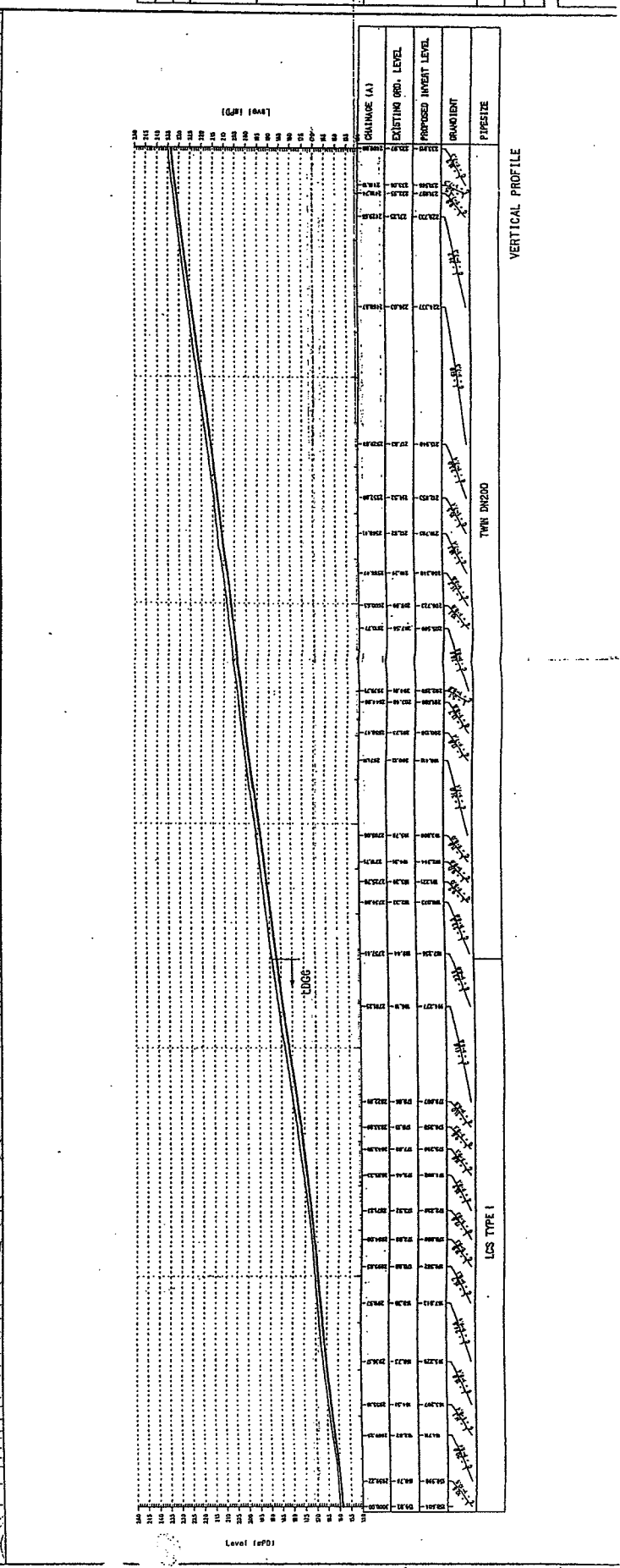
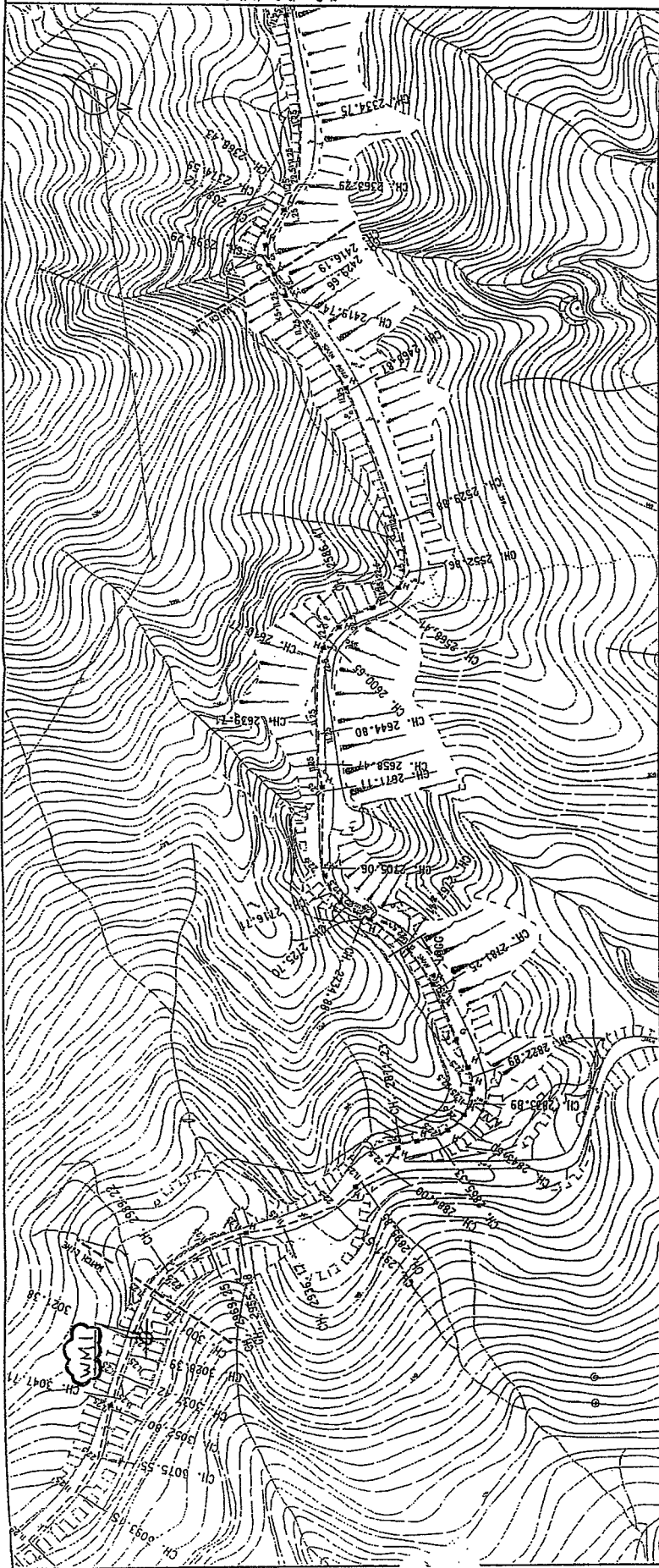
QA/QC Results of Laboratory Analysis of Testing Parameters

Testing Parameter	QC Sample Analysis	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	% Error #	Sample ID	% Recovery @
Turbidity	99.6	WM3	0.8	---	---
Nitrate + Nitrite	91.7	---	---	---	---
Oil & Grease	96.2	---	---	---	---
Ammoniacal Nitrogen	105.8	---	---	---	---
Synthetic detergents	---	---	---	---	---
Biochemical Oxygen Demand (5-day)	102.5	WM3	2.1	---	---
Total Phosphates	102.6	---	---	---	---
Testing Parameter	QC Sample Analysis	Sample Duplicate		Sample Spike	
	% Recovery *	Sample ID	Difference between Duplicates +	Sample ID	% Recovery @
pH Value(at 25°C)	---	WM3	0.01 unit	---	---

Note: (*) % Recovery of QC sample should be between 80% to 120%.
 (#) % Error of Sample Duplicate should be between -10% to 10%.
 (@) % Recovery of Sample Spike should be between 80% to 120%.
 (+) Difference between Duplicates should be less than 0.1 unit for pH value.



Figures



CHAINAGE (A)	EXISTING ORD. LEVEL	PROPOSED INVERT LEVEL	GRADIENT	PIPESIZE
0+00	100.00	100.00	0.00	150
0+10	105.00	105.00	0.00	150
0+20	110.00	110.00	0.00	150
0+30	115.00	115.00	0.00	150
0+40	120.00	120.00	0.00	150
0+50	125.00	125.00	0.00	150
0+60	130.00	130.00	0.00	150
0+70	135.00	135.00	0.00	150
0+80	140.00	140.00	0.00	150
0+90	145.00	145.00	0.00	150
1+00	150.00	150.00	0.00	150
1+10	155.00	155.00	0.00	150
1+20	160.00	160.00	0.00	150
1+30	165.00	165.00	0.00	150
1+40	170.00	170.00	0.00	150
1+50	175.00	175.00	0.00	150
1+60	180.00	180.00	0.00	150
1+70	185.00	185.00	0.00	150
1+80	190.00	190.00	0.00	150
1+90	195.00	195.00	0.00	150
2+00	200.00	200.00	0.00	150
2+10	205.00	205.00	0.00	150
2+20	210.00	210.00	0.00	150
2+30	215.00	215.00	0.00	150
2+40	220.00	220.00	0.00	150
2+50	225.00	225.00	0.00	150
2+60	230.00	230.00	0.00	150
2+70	235.00	235.00	0.00	150
2+80	240.00	240.00	0.00	150
2+90	245.00	245.00	0.00	150
3+00	250.00	250.00	0.00	150
3+10	255.00	255.00	0.00	150
3+20	260.00	260.00	0.00	150
3+30	265.00	265.00	0.00	150
3+40	270.00	270.00	0.00	150
3+50	275.00	275.00	0.00	150
3+60	280.00	280.00	0.00	150
3+70	285.00	285.00	0.00	150
3+80	290.00	290.00	0.00	150
3+90	295.00	295.00	0.00	150
4+00	300.00	300.00	0.00	150
4+10	305.00	305.00	0.00	150
4+20	310.00	310.00	0.00	150
4+30	315.00	315.00	0.00	150
4+40	320.00	320.00	0.00	150
4+50	325.00	325.00	0.00	150
4+60	330.00	330.00	0.00	150
4+70	335.00	335.00	0.00	150
4+80	340.00	340.00	0.00	150
4+90	345.00	345.00	0.00	150
5+00	350.00	350.00	0.00	150
5+10	355.00	355.00	0.00	150
5+20	360.00	360.00	0.00	150
5+30	365.00	365.00	0.00	150
5+40	370.00	370.00	0.00	150
5+50	375.00	375.00	0.00	150
5+60	380.00	380.00	0.00	150
5+70	385.00	385.00	0.00	150
5+80	390.00	390.00	0.00	150
5+90	395.00	395.00	0.00	150
6+00	400.00	400.00	0.00	150

- LEGENDS :
- EFFLUENT PIPELINE ALIGNMENT
 - EXISTING GROUND LEVEL
 - EFFLUENT PIPELINE PROFILE
 - HATCHBOX CHAMBER
 - GATE VALVES CHAMBER
 - △ VENTILATION PIPE CHAMBER
 - BENDS

NOTE:

1. REFER TO DRAWING NO. 23400/TN074 FOR GENERAL NOTES
2. USE STANDARD COLLECTION SYSTEM, LAMP - LOWER BUILT CONTAINING CHAMBER
3. USE STANDARD COLLECTION SYSTEM, LAMP - LOWER BUILT CONTAINING CHAMBER
4. REFER DRAWING NO. 23400/TN074 AND FOR DETAILS OF WASTE CHAMBER
5. VENTILATION PIPE CHAMBER TO BE PROVIDED AT INTERVALS OF 100M ALONG THE PIPE
6. DUCT LOCATION OF ROADS AND CHAMBERS TO BE INDICATED ON SITE
7. APPROXIMATE CHAMBER SIZE AND SPACING SHALL BE AS SHOWN WITH CHAMBER
8. APPROXIMATE CHAMBER SIZE AND SPACING SHALL BE AS SHOWN WITH CHAMBER

ISSUE FOR CONSTRUCTION	BRC	08/03
Rev	Description	By Date
ARUP		
On Amp & Palmier Hong Kong Limited		
Project No. DC/2003/01		
CONTRACT NO. DC/2003/01		
NGONG PING SEWAGE TREATMENT		
PLANT, TRUNK SEWERS AND		
EFFLUENT EXPORT PIPELINE		
Drawing No. 23400/TN074		
EFFLUENT EXPORT PIPELINE:		
ALIGNMENT AND PROFILE		
(SHEET 5 OF 10)		
Drawing No. 23400/TN074		
Scale: 1:1000		
Horizontal Curve: VER. CURVE AT 1:1000		
Vertical Curve: VER. CURVE AT 1:1000		
SPECIAL ADMINISTRATIVE REGION		

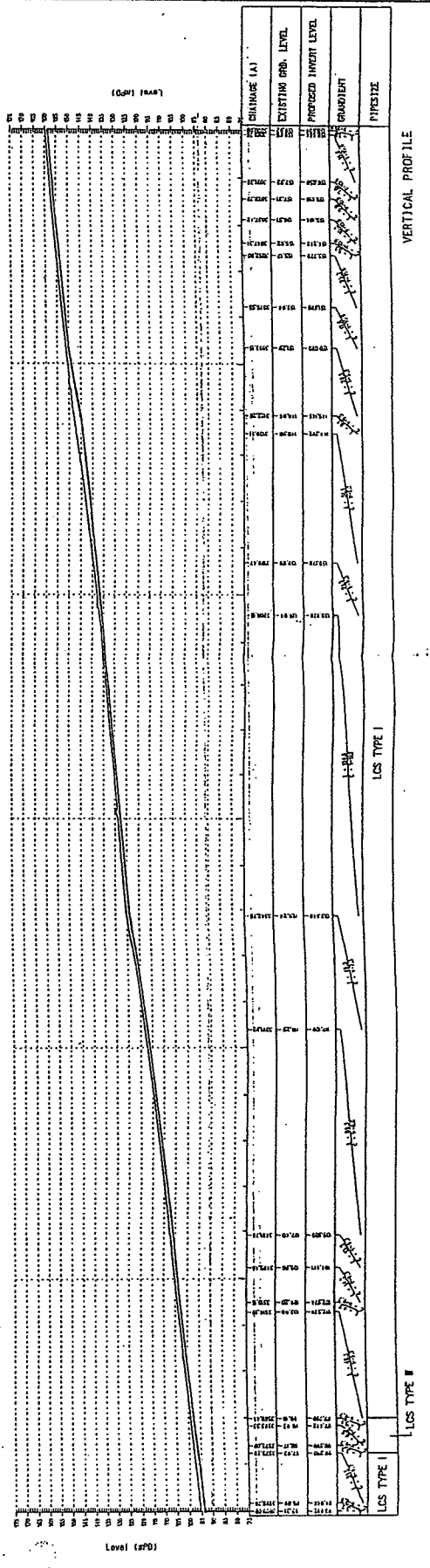
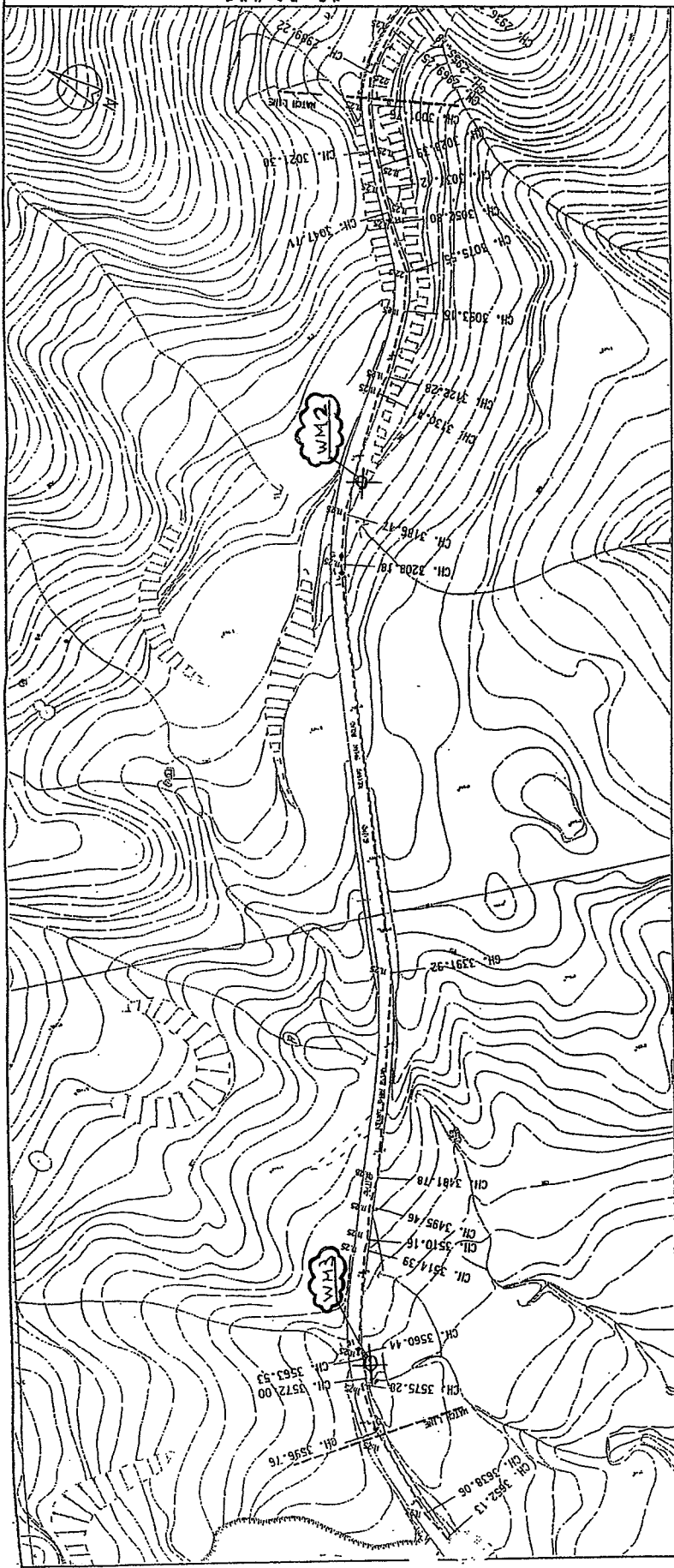


LEGENDS :

- EFFLUENT PIPELINE ALIGNMENT
- - - EXISTING GROUND LEVEL
- EFFLUENT PIPELINE PROFILE
- H HATCHBOX CHAMBER
- G GATE VALVES CHAMBER
- △ V VENTILATION PIPE CHAMBER
- 1:25 SOUNDS

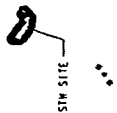
NOTE:

1. REFER TO DRAWING NO. DC/2100/001 FOR SPECIAL NOTES
2. ALL LEAKAGE CALCULATIONS SHALL BE BASED ON LATEST STREET LANDING RECORDS
3. EXISTING PIPES AND STRUCTURES TO BE DEMOLISHED OR REPAIRED AS NEEDED
4. REFER DRAWING NO. DC/2100/001 FOR THE DETAILS OF BENT VALVE CHAMBERS
5. FOR THE DETAILS OF BENT VALVE CHAMBERS TO BE EXTENDED TO FIT
6. EACH LOCATION OF BENT VALVE CHAMBER TO BE EXTENDED TO FIT
7. EACH LOCATION OF BENT VALVE CHAMBER TO BE EXTENDED TO FIT
8. PROVIDED EVERY ROOM, EACH LOCATION TO BE EXTENDED TO FIT



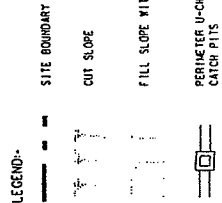
ISSUE FOR CONSTRUCTION	DATE 09/03
Rev Description	By: Date
Comments	
ARUP Corporation of Hong Kong Limited	
Project No: DC/2100/001	
CONTRACT NO. DC/2100/001	
NGONG PING SEWAGE TREATMENT PLANT, TRUNK SEWERS AND EFFLUENT EXPORT PIPELINE	
Drawing No:	
EFFLUENT EXPORT PIPELINE: ALIGNMENT AND PROFILE (SHEET 6 OF 10)	
Drawing No:	
Scale:	
Drawing No:	234007075
Scale:	1:25
Drawing No:	
Scale:	
Drawing No:	
Scale:	

1:2500
SCALE



KEY PLAN

NOTE:
1. COORDINATES SHOWN ON THE TABLE ARE MEASURED AT THE OUTSIDE WALL AT MFD.
2. PLAN OF STRUCTURES ARE SHOWN AT 44.41.00 MFD.



Rev	Description	By	Date
1	AS-CONSTRUCTED DRAWING	RL	01/05

Contractor
ARUP
By: [Signature] Title: [Title]

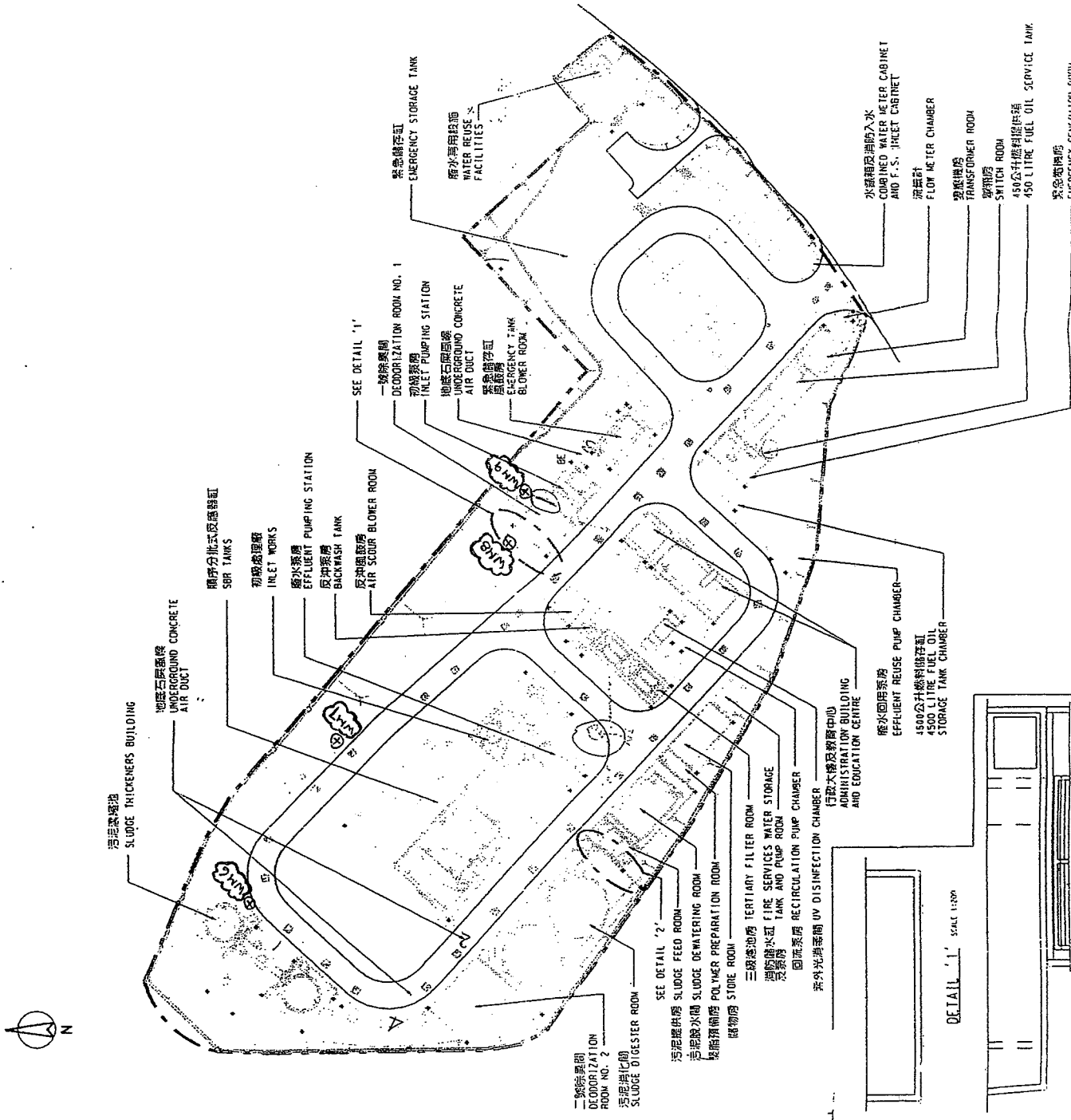
Project No: 20007/202
Drawing Title: 碧山污水处理厂设施图例
NEW PUMP SPACE TREATMENT PLANT, TRUNK SEWER AND EFFLUENT BOWT PIPELINE

Drawn by: [Name]
Checked by: [Name]
Scale: [Scale]
Date: 2000/7/20

香港特別行政區政府
THE HONG KONG GOVERNMENT
SPECIAL ADMINISTRATIVE REGION

SETTLING OUT TABLE

LOCATION	COORDINATES	
	NORTHING	EASTING
A	07166.997	07166.022
B	07165.201	07175.432
C	07175.444	07170.316
D	07170.442	07172.689
E	07164.128	07160.374
F	07161.487	07163.543
G	07160.244	07161.571
H	07162.654	07167.481
I	07161.215	07165.543
J	07162.117	07160.531
K	07160.281	07158.006
L	07161.328	07159.584
M	07164.287	07147.136
N	07173.467	07158.603
O	07161.119	07154.538
P	07164.012	07165.107
Q	07160.410	07168.485
R	07160.237	07163.279
S	07162.051	07162.539
T	07161.148	07169.106
U	07161.085	07163.348
V	07161.252	07163.185
W	07161.371	07162.534
X	07162.153	07161.175
Y	07161.329	07162.175
Z	07161.624	07162.154
AA	07161.445	07162.324
AB	07162.901	07161.375
AC	07161.214	07162.174
AD	07161.144	07162.174
AE	07162.003	07161.335
AF	07161.187	07161.337
AG	07161.325	07161.193
AH	07161.325	07161.193
AI	07161.288	07162.370
AJ	07161.445	07162.248
AK	07162.166	07162.248
AL	07160.334	07162.539
AM	07162.024	07162.539
AN	07161.860	07162.310
AO	07162.440	07162.310
AP	07161.560	07162.604
AQ	07161.460	07162.610
AR	07162.440	07162.310
AS	07161.933	07162.163
AT	07161.560	07162.610
AU	07162.060	07162.332
AV	07162.244	07162.332
AW	07162.374	07162.349
AX	07161.550	07162.538
AY	07161.729	07162.538
AZ	07161.640	07162.151
BA	07161.640	07162.151
BB	07162.235	07162.016
BC	07162.324	07162.016
BD	07162.324	07162.016
BE	07161.185	07162.485
BF	07161.185	07162.485
BG	07161.185	07162.485
BH	07161.185	07162.485
BI	07161.185	07162.485
BJ	07161.185	07162.485
BK	07161.185	07162.485
BL	07161.185	07162.485
BM	07161.185	07162.485
BN	07161.185	07162.485
BO	07161.185	07162.485
BP	07161.185	07162.485



DETAIL '1' SCALE 1:500

DETAIL '2' SCALE 1:500