

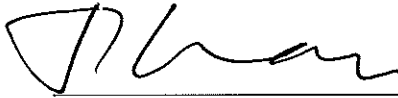
ASB Biodiesel (Hong Kong) Limited

Development of a Biodiesel Plant at Tseung Kwan O Industrial Estate

Monthly EM&A Report

September 2012

(Version 1.0)

Certified By 
(Environmental Team Leader)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

CINOTECH accepts no responsibility for changes made to this report by third parties

CINOTECH CONSULTANTS LTD

Room 1710, Technology Park,

18 On Lai Street,

Shatin, NT, Hong Kong

Tel: (852) 2151 2083 Fax: (852) 3107 1388

Email: info@cinotech.com.hk



MANNINGS
(Asia) Consultants Limited

Address: 5/F, Winning Commercial Building, 46-48 Hillwood Road, Tsim Sha Tsui, Kowloon
Tel: 852 - 3168 2028 Fax: 852 - 3168 2022

<i>To:</i>	Cinotech	<i>Date:</i>	11 October 2012
<i>Attn:</i>	Ms. Ivy Tam / Ms. Betty Choi	<i>Fax:</i>	3107 1388
<i>From:</i>	Mr. Mark Cheung	<i>Ref:</i>	D1067/G04135
<i>Job No.</i>	D1067	<i>Total Pages:</i>	1

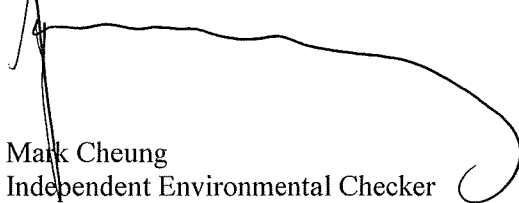
**SUBJECT: Development of a Biodiesel Plant at Tseung Kwan O Industrial Estate
Monthly EM&A Report for September 2012**

Dear Sir / Madam,

We refer to your submission of the Monthly EM&A Report for September 2012 via email dated 11 October 2012.

We write to advise that we have no comment on the captioned report.

Regards,



Mark Cheung
Independent Environmental Checker

KTC/gk

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EXECUTIVE SUMMARY

Introduction

1. This is the 40th monthly Environmental Monitoring and Audit (EM&A) Report prepared by Cinotech Consultants Limited for Development of a Biodiesel Plant at Tseung Kwan O Industrial Estate". This report documents the findings of EM&A Works conducted in September 2012.
2. The major site activities undertaken in the reporting month included:
 - General site cleaning and tidying.
 - Zone 1A Administration Building – Finishing works.
 - Zone 1A Administration Building – MEK room metal works
 - Zone 1A Administration Building – Installation of roof waterproofing system works
 - Zone 1B Processing Building – Cladding system installation works
 - Zone 1B Fat Preparation and Steam Boiler Room Building – Equipment Installation works
 - Zone 1B Fat Preparation Building – Fire paint works
 - Zone 2A Tank Farm – Steel tank erection works
 - Zone 2A Tank Farm – Steel tank fabrication works
 - Zone 2A Tank Farm – Tank sand blasting and painting works
 - Zone 2A GTWSR – Superstructure construction works
 - Zone 2A GTWSR – Equipment installation works
 - Zone 2B-2E Tank Farm – Steel tank fabrication works
 - WWTP – RC superstructure construction works
 - WWTP – Equipment installation works
 - Jetty – Bore pile installation works
 - Building Services – P&D works
 - Building Services – Fire Service works
 - Building Services – MVAC works
 - Building Services – Electrical works
 - Building Services – Lift installation works
 - External Works – Boundary wall construction works
 - External Works – Storm water drainage works
 - External Works – Foul water drainage works
 - External Works – Fire Services pipes laying works
 - External Works – Cable laying works
 - External Works – Pavement works

Environmental Monitoring and Audit Works

3. Environmental monitoring and audit works for the Project were performed regularly as stipulated in the EM&A Manual and the results were checked and reviewed. The implementation of the environmental mitigation measures and environmental complaint handling procedures were also checked.
4. Bentonite leakage was reported on 29 September 2012. The leakage was rectified and the incident was investigated. The Contractor agreed to carry out precautionary measures to prevent similar incident from happening again.

Environmental Licenses and Permits

5. Licenses/Permits granted to the Project include the Environmental Permit (EP) for the Project. Environmental Permits No. EP-319/2009 and EP-319/2009/A were issued on 11 March 2009 and 7 April 2009 respectively. The Contractor has applied for the Registration of Chemical Waste Producer (WPN-5113-839-C1186-15), Construction Noise Permit (GW-RE0757-12), Wastewater Discharge License (WT00004508-2009), Notification of Works under APCO (337009) and Waste Discharge Account (7013917). The new Construction Noise Permit (GW-RE0757-12) was issued by the EPD on 11th September 2012.

Key Information in the Reporting Month

6. Summary of key information in this reporting month is tabulated in **Table I**.

Table I Summary Table for Key Information in the Reporting Month

Event	Event Details		Action Taken	Status	Remark
	Number	Nature			
Complaint received	2	Noise nuisance due to chiselling work at jetty area	Covered the chisel machine with sound proof canvas, Stop night time work	Closed	---
Changes to the assumptions and key construction / operation activities recorded	0	---	N/A	N/A	---
Status of submissions under EP	1	Monthly EM&A Report for August 2012	Submitted to EPD on 13 September 2012	Verified by IEC	---
Notifications of any summons & prosecutions	0	---	N/A	N/A	---

Future Key Issues

7. Major site activities for the coming three months will include:
- General site cleaning and tidying.
 - Administration Building – Roof waterproofing works
 - Administration Building – Finishing works
 - Administration Building – Windows, louver and doors installation works
 - Processing Building – Windows, louver and doors installation works
 - Fat Preparation Building – Finishing works
 - Boiler Room – Roof waterproofing system works
 - Boiler Room – Structural steel works
 - Tank Farm 2A – Tanks erection and fabrication works

- Tank Farm 2A – Tank sand blasting and painting works
 - Tank Farm 2A GTWSR – Equipment installation works
 - Tank Farm 2B-2E – Tank erection and fabrication works
 - WWTP – RC superstructure construction works
 - WWTP – IC Reactor erection works
 - WWTP – Water proofing system installation works
 - Jetty – Bore pile installation works
 - Pipe Bridge – Pipe support construction works and pipe bridge erection works.
 - External – Boundary wall construction works.
 - Building Services – Fire services works
 - Building Services – MVAC works
 - Building Services – Electrical works
 - Building Services – P&D works
 - Building Services – Lift installation works
 - External Works – Storm water drainage works
 - External Works – Foul water drainage works
 - External Works – Plumbing laying works
 - External Works – Fire Services piping laying works
 - External Works – Cable laying works
 - External Works – Pavement works
8. The future environmental concerns are air quality, water quality, waste management and surface runoff from construction works.

1 INTRODUCTION

Background

- 1.1 Development of a Biodiesel Plant at Tseung Kwan O Industrial Estate is a Designated Project (hereafter referred to as “the Project”) under the Environmental Impact Assessment Ordinance (Cap. 449). A study of environmental impact assessment (EIA) was undertaken to consider the key issues of air quality, noise, water quality, ecological and identify possible mitigation measures associated with the works. An EIA Report was approved by the Environmental Protection Department (EPD) on 26 February 2009.
- 1.2 The project is to construct and operate a 100,000 tonnes per annum biodiesel plant at Tseung Kwan O Industrial Estate. The plant will use a multi-feedstock which consists of waste cooking oil (WCO), oil and grease recovered from grease trap waste (GTW), Palm Fatty Acid Distillate (PFAD) and animal fats. The proposed biodiesel plant not only offers a convenient recycling outlet for GTW and WCO but also converts the oil and grease recovered from these wastes into useful products. The Project also offers a cleaner alternative to diesel fuel to the Hong Kong market. The main processes include the followings:-
- Construction of feedstock reception and storage facilities, and offices;
 - Construction of a grease trap waste pre-treatment facility (with a designated treatment capacity of about 200,000 tonnes per annum);
 - Construction of a wastewater treatment plant (with a designed treatment capacity of about 170,000 m³ per annum);
 - Installation of biodiesel production and glycerine purification system;
 - Construction of product storage and ancillary facilities;
 - Pretreatment of grease trap waste;
 - Treatment of wastewater generated from feedstock pre-treatment and glycerine dewatering process, and filtrates from dewatering process of sludge treatment;
 - Transesterification of feedstock with alcohol-catalyst; and
 - Purification of biodiesel.
- 1.3 The general layout of the Project is shown in **Figure 1.1**.
- 1.4 Layout plan of tank farm **2A, 2B to 2E** is revised and a report is made by Environmental Resources Management (ERM) regarding such change. The report concluded that no deviation is found from the approved EIA report.
- 1.5 An Environmental Permit (EP) No. EP-319/2009 and EP-319/2009/A was issued on 11 March 2009 and 7 April 2009 respectively for Development of a Biodiesel Plant at Tseung Kwan O Industrial Estate to ASB Biodiesel (Hong Kong) Limited as the Permit Holder.
- 1.6 Cinotech Consultants Limited was commissioned by the Contractor to undertake the Environmental Monitoring and Audit (EM&A) works for the Project. This is the 40th Monthly EM&A report summarizing the EM&A works for the Project in September 2012.

Project Organizations

1.7 Different parties with different levels of involvement in the project organization include:

- Project Proponent – ASB Biodiesel (Hong Kong) Limited
- Project Manager – AECOM
- Contractor – China Harbour Engineering Company Limited (CHEC)
- Environmental Team (ET) – Cinotech Consultants Limited
- Independent Environmental Checker (IEC) – Mannings (Asia) Consultants Ltd.

1.8 The responsibilities of respective parties are detailed in Section 1.10 of the Final EM&A Manual of the Project.

1.9 The key contacts of the Project are shown in **Table 1.1**.

Table 1.1 Key Project Contacts

Party	Role	Name	Position	Phone No.	Fax No.
ASB	Project Proponent	Ms. Sylvia Har	Senior Plant Engineer	9479 0949	3741 1661
Cinotech	Environmental Team	Dr. HF Chan	ET Leader	2151 2088	3107 1388
		Ms. Ivy Tam	Project Coordinator	2151 2090	
		Ms. Betty Choi	Audit Team Leader	2151 2072	
Mannings	Independent Environmental Checker	Mr. Mark Cheung	Independent Environmental Checker	3168 2028	3168 2022
		Mr. Gavin Kwok	Assistant to Independent Environmental Checker	3168 2028	
AECOM	Project Manager	Mr. Matthew Lau	Construction Manager	9363 5586	N/A
CHEC	Contractor	Mr. Peter Chung	Project Manager	9471 2438	2623 9226
		Mr. Anson Wong	Safety and Environmental Officer	9656 3837	
		Mr. Simon Li	Environmental Supervisor (Ass. Planning Engineer)	6152 7867	

Construction Programme

1.10 The site activities undertaken in the reporting month were:

- General site cleaning and tidying.
- Zone 1A Administration Building – Finishing works.
- Zone 1A Administration Building – MEK room metal works
- Zone 1A Administration Building – Installation of roof waterproofing system works
- Zone 1B Processing Building – Cladding system installation works
- Zone 1B Fat Preparation and Steam Boiler Room Building – Equipment Installation works
- Zone 1B Fat Preparation Building – Fire paint works
- Zone 2A Tank Farm – Steel tank erection works
- Zone 2A Tank Farm – Steel tank fabrication works
- Zone 2A Tank Farm – Tank sand blasting and painting works
- Zone 2A GTWSR – Superstructure construction works
- Zone 2A GTWSR – Equipment installation works
- Zone 2B-2E Tank Farm – Steel tank fabrication works
- WWTP – RC superstructure construction works
- WWTP – Equipment installation works
- Jetty – Bore pile installation works
- Building Services – P&D works
- Building Services – Fire Service works
- Building Services – MVAC works
- Building Services – Electrical works
- Building Services – Lift installation works
- External Works – Boundary wall construction works
- External Works – Storm water drainage works
- External Works – Foul water drainage works
- External Works – Fire Services pipes laying works
- External Works – Cable laying works
- External Works – Pavement works

Summary of EM&A Requirements

1.11 The EM&A requirements are described in the following sections, including:

- Environmental mitigation measures, as recommended in the project EIA study final report; and
- Environmental requirements in contract documents.

1.12 The advice on the implementation status of environmental protection and pollution control/ mitigation measures is summarized in Section 3 of this report.

2 ENVIRONMENTAL AUDIT

Site Audits

- 2.1 Site audits were carried out by ET on monthly basis to monitor the timely implementation of proper environmental management practices and mitigation measures in the Project site. The summary of the site audit in this reporting month is attached in **Appendix A**.
- 2.2 Site audit was conducted on 19th September 2012 by ET in the reporting month. No non-compliance was observed during the site audits.

Status of Environmental Licensing and Permitting

- 2.3 All permits/licenses obtained for the Project are summarized in **Table 2.1**.

Status of Waste Management

- 2.4 The quantities of waste generated in this reporting month are summarized in **Appendix C**.

Implementation Status of Environmental Mitigation Measures

- 2.5 According to the EIA Study Report, Environmental Permit and the EM&A Manual of the Project, the mitigation measures detailed in the documents are recommended to be implemented during the construction phase. An updated summary of the EMIS is provided in **Appendix B**.

Report on Environmental Non-compliance

- 2.6 Bentonite was found leaking from a crack in the flow-back channel between the bored pile JP13 and bentonite storage tank at jetty area was reported on 29 September 2012. Some bentonite entered the sea but enclosed within silt curtain. Remedial actions taken included termination of the construction work at JP13 for welding work and pumping of contaminated water out for treatment.
- 2.7 An incident report was produced on 5 October 2012 to report findings of investigation on the cause of the incident. Proposed precautionary measures include:
- inspecting the integrity of the flow-back channel before concreting work,
 - reduction of initial level of bentonite slurry in the pile before concrete infill,
 - control of concrete infill rate.
- 2.8 A copy of the incident report can be found in **Appendix F**.

Table 2.1 Summary of Environmental Licensing and Permit Status

Permit / License No.	Valid Period		Details	Status
	From	To		
Environmental Permit (EP)				
EP-319/2009/A	07/04/2009	N/A	Construction and operation of (i) a biochemical plant with a storage capacity of more than 500 tonnes and in which substances are processed and produced; (ii) a storage, transfer and trans-shipment of oil facility with a storage capacity of not less than 1,000 tonnes; and (iii) a dangerous goods godown with a storage capacity exceeding 500 tonnes .	Valid
Registration of Chemical Waste Producer				
WPN-5113-839-C1186-15	12/06/2009	-	Spent Lubrication oil.	Valid
Construction Noise Permit (CNP)				
GW-RE0757-12	21/09/2012	20/03/2013	Use of Powered Mechanical Equipment during 0000-2400 hours on general holidays (including Sundays), 0000-0700 hours and 1900-2400 hours on any day not being a general holiday.	Valid
Wastewater Discharge License				
WT00004508-2009	07/09/2009	-	Discharge of wastewater from construction site including wheel washing water and chemical precipitation tank	Valid
Billing Account for Disposal of Construction Waste				
A/C No.: 7013917	-	-	-	Valid
Notification of Works under APCO				
Ref. no.: 337009	26/10/2011	-	-	Valid

- 2.9 During the site inspection in the reporting month, no non-conformance was identified. The observations and recommendations made during the audit session are summarized in **Table 2.2**.

Table 2.2 Observations and Recommendations of Site Audit

Parameters	Date	Observations and Recommendations	Follow-up
Air Quality	19/09/2012	Stockpile not in use should be covered by tarpaulin.	Follow up action was taken by the Contractor.
Waste/Chemical Management		Drip tray should be provided under oil/chemical containers and should be maintained regularly. Soil inside drip tray should be removed.	Follow up action was taken by the Contractor.

Summary of Complaint and Prosecution

- 2.10 2 environmental related complaints were received in the reporting month. The detail can be found in the following table:

Table 2.3 Complaint Details

Complaint No.	Date	Complaint Details
COM-2012-09-002	07/09/2012	A resident in Lohas Park complained about noise nuisance from the site. Investigation by EPD identified the source to be chiselling work at the jetty area. The Contractor decided to suspend the corresponding work during restricted hours during investigation period. Subsequent inspection and noise measurement by the EPD on 12 th September 2012 concluded that the night time noise level at Lohas Park was satisfactory.
COM-2012-09-003	27/09/2012	A resident in Lohas Park complained about night time noise nuisance from the site. The noise source was identified to be chiselling work at the jetty area JP3. The Contractor decided to carry out chiselling work during normal operation hours only.

- 2.11 No prosecution or notification of summons was received in the reporting month.
- 2.12 Since the Project commencement, there were a total of 3 project-related environmental complaints. No prosecution or notification of summons was received since the Project commencement. The Complaint Log is attached in **Appendix D**.

3 FUTURE KEY ISSUES

Key Issues for the Coming Month

3.1 Key issues to be considered in the coming month include:

- Noise from operation of the equipment and machinery on-site;
- Effluent discharge generated from surface runoff;
- Dust generated from excavation works and stockpile of dusty materials;
- Maintenance of de-silting facilities and drainage system, such as U-channels;
- Storage of chemicals/fuel and chemical waste/waste oil on site;
- Accumulation of stagnant water in the site areas;
- Accumulation of C&D waste and general waste on site; and
- Suspended mud, sediment and potential leakage of bentonite slurry from marine piling work for jetty construction.

3.2 In September, bore pile installation was carried out in the jetty area. During the site inspection, silt curtain was erected as a mitigation measure. Leakage of bentonite slurry was reported in 29 September 2012. No spreading of bentonite to the open sea was found beyond the silt curtain area. The Contractor agreed to implement precautionary measures recommended in the incident report to prevent future leakage. The process will be closely monitored by site staff and during site inspection to prevent leakage.

Construction Program for the Next Months

3.3 A tentative construction programme is provided in **Appendix E**. The major construction activities in the coming three months will include:

- General site cleaning and tidying.
- Administration Building – Roof waterproofing works
- Administration Building – Finishing works
- Administration Building – Windows, louver and doors installation works
- Processing Building – Windows, louver and doors installation works
- Fat Preparation Building – Finishing works
- Boiler Room – Roof waterproofing system works
- Boiler Room – Structural steel works
- Tank Farm 2A – Tanks erection and fabrication works
- Tank Farm 2A – Tank sand blasting and painting works
- Tank Farm 2A GTWSR – Equipment installation works
- Tank Farm 2B-2E – Tank erection and fabrication works
- WWTP – RC superstructure construction works
- WWTP – IC Reactor erection works
- WWTP – Water proofing system installation works
- Jetty – Bore pile installation works
- Pipe Bridge – Pipe support construction works and pipe bridge erection works.
- External – Boundary wall construction works.
- Building Services – Fire services works
- Building Services – MVAC works
- Building Services – Electrical works

- Building Services – P&D works
- Building Services – Lift installation works
- External Works – Storm water drainage works
- External Works – Foul water drainage works
- External Works – Plumbing laying works
- External Works – Fire Services piping laying works
- External Works – Cable laying works
- External Works – Pavement works

4 CONCLUSIONS AND RECOMMENDATIONS

Conclusions

- 4.1 Environmental audit works were conducted in the reporting month. Site inspections were conducted on a monthly basis. The results were reviewed and checked.
- 4.2 There was no environmental complaint, prosecution or notification of summons received.

Recommendations

- 4.3 According to the environmental audit performed in the reporting month, the following recommendations were made:

Water Impact

- To identify any wastewater discharges from site.
- To ensure properly maintenance for de-silting facilities.
- To clear the silt and sediment in the sedimentation tanks.
- To review the capacity of de-silting facilities for discharge.
- To divert all the water generated from construction site to de-silting facilities with enough handling capacity before discharge.
- To avoid accumulation of stagnant and ponding water on site.
- To clear the drainage channel regularly to prevent blockage.
- To set up silt curtain around marine piling work.
- To check integrity of bore pile casing and connection pipes to prevent leakage.
- To monitor bentonite flow rate to prevent overflowing.
- To lower bentonite level in bored pile before concreting work.

Dust Impact

- To remove fugitive dusty material on the haul road periodically.
- Excavated dusty materials or stockpile of dusty materials should be covered by impervious sheeting, or sprayed with water so as to maintain entire surface wet.

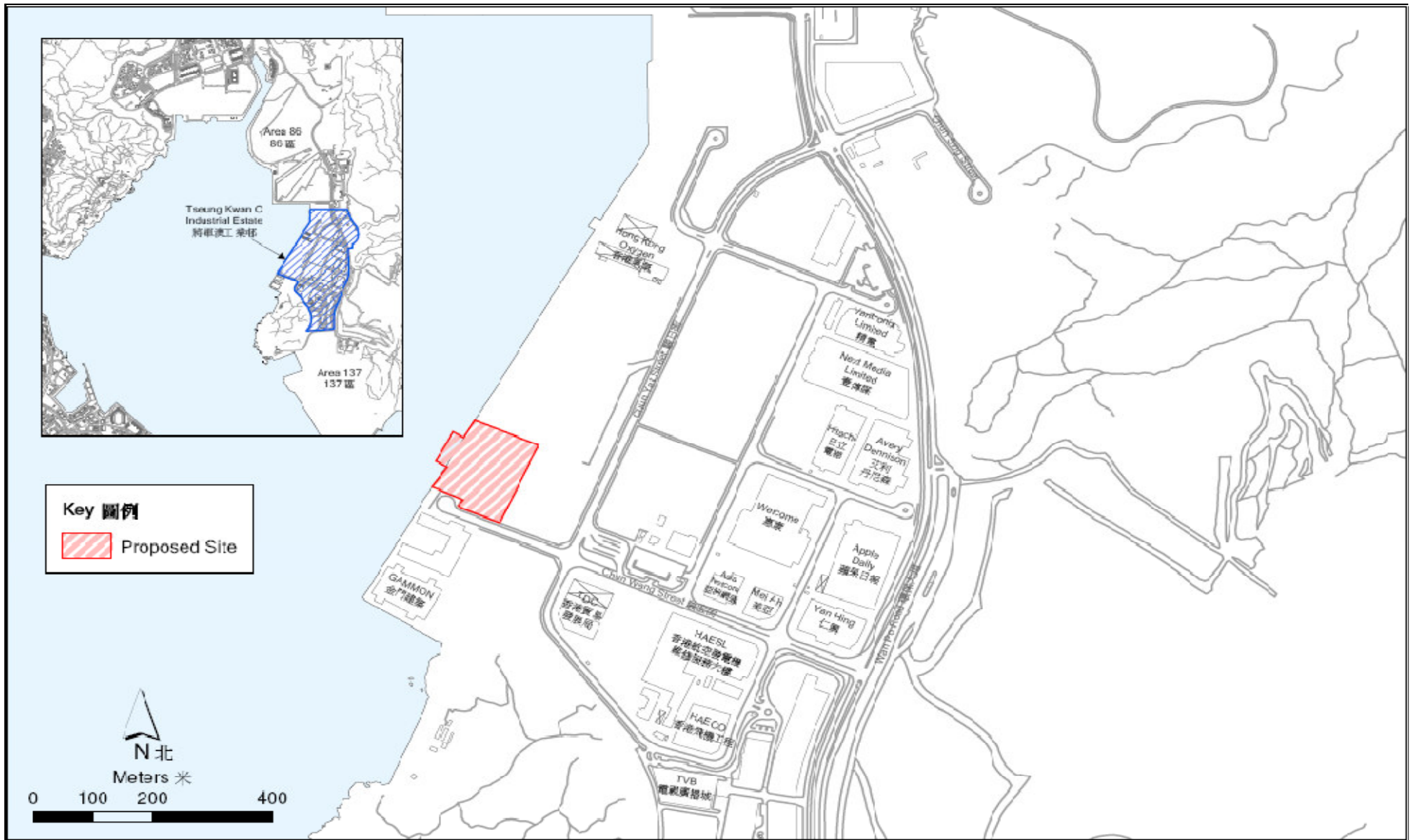
Noise Impact

- To space out noisy equipment and position as far away as possible from sensitive receivers.
- To inspect the noise sources inside the site.

Waste / Chemical Management

- To provide proper rubbish bins / skips for waste collection.
- To provide proper storage area for oil container on site.
- To avoid and check for any accumulation of waste materials or rubbish on site.
- To avoid any discharge or accidental spillage of chemical waste or oil directly from the equipment.

FIGURES



Title	Development of a Biodiesel Plant at Tseung Kwan O Industrial Estate		Scale	N.T.S	Project No.	MA9021	CINOTECH
	Site Layout Plan		Date	Jun-09	Figure	1.1	

**APPENDIX A
SITE AUDIT SUMMARY**

Development of a Biodiesel Plant at Tseung Kwan O Industrial Estate

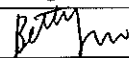
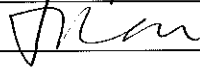
Monthly Site Inspection Record Summary

Inspection Information

Checklist Reference Number	120919
Date	19 September 2012 (Wednesday)
Time	15:45 – 16:30

Ref. No.	Non-Compliance	Related Item No.
-	None	-

Ref. No.	Remarks/Observations	Related Item No.
120919-R02	<p>A. Water Quality</p> <ul style="list-style-type: none"> No environmental deficiency was identified during site inspection. <p>B. Air Quality</p> <ul style="list-style-type: none"> Stockpile not in use should be covered by tarpaulin. <p>C. Noise</p> <ul style="list-style-type: none"> No environmental deficiency was identified during site inspection. 	C10
120919-R01	<p>D. Waste / Chemical Management</p> <ul style="list-style-type: none"> Drip tray should be provided under oil/chemical containers and should be maintained regularly. Soil inside drip tray should be removed. <p>E. Permit / Licenses</p> <ul style="list-style-type: none"> No environmental deficiency was identified during site inspection. <p>F. Reminders</p> <ul style="list-style-type: none"> No environmental deficiency was identified during site inspection. <p>G. Others</p> <p>Follow-up on previous audit section (Ref. No.:120718):</p> <ul style="list-style-type: none"> All environmental deficiencies were improved/rectified by the Contractor. 	E8

	Name	Signature	Date
Recorded by	Betty Choi		19 September 2012
Checked by	Dr. HF Chan		19 September 2012

**APPENDIX B
UPDATED ENVIRONMENTAL
MITIGATION IMPLEMENTATION
SCHEDULE**

Appendix B - Summary of Environmental Mitigation Implementation Schedule (Construction Phase)

Types of Impacts	Mitigation Measures	Status
<p align="center">Construction Dust</p>	<ul style="list-style-type: none"> • Dust control measures such as water spaying on roads and dusty areas, covering of lorries by impervious sheets and controlling of the falling height of fill materials will be implemented; • Effective dust screens, sheeting or netting will be provided to enclose the scaffolding from the ground level of the facility during the building construction; • All debris and materials will be covered or stored in a sheltered debris collection area; • Hoarding from ground level will be provided along the entire length of the site boundary except for a site entrance or exit; • Every stockpile of dusty materials will be covered entirely by impermeable sheeting or placed in an area sheltered on the top and the 3 sides; • Regular maintenance and checking of the diesel powered mechanical equipment will be adopted to avoid any black smoke emissions and to minimize gaseous emissions. • Monthly site audits will be conducted to ensure the implementation of suitable dust control measures and good site practices. 	<p align="center">^</p> <p align="center">^</p> <p align="center">^</p> <p align="center">^</p> <p align="center">•</p> <p align="center">^</p> <p align="center">^</p>
<p align="center">Construction Noise</p>	<ul style="list-style-type: none"> • Only well-maintained plant will be operated on-site and plant will be serviced regularly during the construction program; • Silencers or mufflers on construction equipment will be utilized and will be properly maintained during the construction program; • Mobile plant, if any, will be sited as far from NSRs as possible; • Machines and plant (such as trucks) that may be in intermittent use will be shut down between work periods or will be throttled down to a minimum; • Plant known to emit noise strongly in one direction will, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and • Material stockpiles and other structures will be effectively utilised, wherever practicable, in screening noise from onsite construction activities. 	<p align="center">^</p> <p align="center">^</p> <p align="center">^</p> <p align="center">^</p> <p align="center">^</p> <p align="center">^</p>

Remarks: ^ Compliance of mitigation measure; X Non-compliance of mitigation measure;
 N/A Not Applicable at this stage; • Non-compliance but rectified by the contractor;
 * Recommendation was made during site audit but improved/rectified by the contractor;
 # Non-compliance but rectified/improved by the contractor and awaiting IEC's further comment.

Types of Impacts	Mitigation Measures	Status
Water Quality	<p><u>Piling Activities</u></p> <ul style="list-style-type: none"> Silt curtain will be installed around the marine piling area to contain any suspended mud and sediments generated during the piling works. Silt removal facilities such as silt traps or sedimentation facilities will be provided to remove silt particles from groundwater (if pumping is required) to meet the requirements of the TM standard under the WPCO. The design of silt removal facilities will be based on the guidelines provided in ProPECC PN 1/94. All drainage facilities and erosion and sediment control structures will be inspected monthly and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. 	^
	<p><u>Construction Site Run-off and Drainage</u></p> <ul style="list-style-type: none"> Silt removal facilities such as silt traps or sedimentation facilities will be provided to remove silt particles from runoff to meet the requirements of the TM standard under the WPCO. The design of silt removal facilities will be based on the guidelines provided in ProPECC PN 1/94. All drainage facilities and erosion and sediment control structures will be inspected monthly and maintained to ensure proper and efficient operation at all times and particularly during rainstorms. Careful programming of the works to minimise surface excavations for the construction works during the wet season. If excavation of soil cannot be avoided during the wet season, exposed slope surfaces will be covered by a tarpaulin or other means. Other measures that need to be implemented before, during, and after rainstorms are summarised in ProPECC PN 1/94. Exposed soil surfaces will be protected by paving or fill material as soon as possible to reduce the potential of soil erosion. Open stockpiles of construction materials or construction wastes on-site of more than 50m³ will be covered with tarpaulin or similar fabric during rainstorms. These materials will not be placed near the seawall area. 	^ ^ ^ ^
	<p><u>General Construction Activities</u></p> <ul style="list-style-type: none"> Debris and refuse generated on-site will be collected, handled and disposed of properly to avoid entering the nearby water sensitive receivers (WSRs). Stockpiles of cement and other construction materials will be kept covered when not being used. Oils and fuels will only be used and stored in designated areas which have pollution prevention facilities. All fuel tanks and storage areas will be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank. The bund will be drained of rainwater after a rain event. 	^ ^

Remarks: ^ Compliance of mitigation measure; X Non-compliance of mitigation measure;
 N/A Not Applicable at this stage; • Non-compliance but rectified by the contractor;
 * Recommendation was made during site audit but improved/rectified by the contractor;
 # Non-compliance but rectified/improved by the contractor and awaiting IEC's further comment.

Types of Impacts	Mitigation Measures	Status
	<p data-bbox="394 225 902 252"><u>Sewage generated from On-site Workforce</u></p> <ul data-bbox="443 296 1980 427" style="list-style-type: none"> <li data-bbox="443 296 1980 360">• Temporary sanitary facilities, such as portable chemical toilets, will be provided on-site. A specialised contractor will be responsible for regular collection and appropriate disposal of the sewage and maintenance of these facilities. <li data-bbox="443 363 1980 427">• Monthly site inspections will be carried out during construction to ensure that the mitigation measures listed above are properly implemented. The site audit frequency will be increased to weekly intervals during the piling works. 	<p data-bbox="2040 296 2101 323">N/A</p> <p data-bbox="2056 363 2085 391">^</p>
<p data-bbox="215 488 315 515">Ecology</p>	<ul data-bbox="443 472 1980 563" style="list-style-type: none"> <li data-bbox="443 472 1980 563">• Mitigation measures for minimising water quality impacts are presented in detail above. These measures will be properly implemented and good construction practices will be adopted to minimise potential adverse impacts to marine ecological resources. 	<p data-bbox="2056 488 2085 515">^</p>

Remarks: ^ Compliance of mitigation measure; X Non-compliance of mitigation measure;
N/A Not Applicable at this stage; • Non-compliance but rectified by the contractor;
* Recommendation was made during site audit but improved/rectified by the contractor;
Non-compliance but rectified/improved by the contractor and awaiting IEC's further comment.

**APPENDIX C
WASTE GENERATION IN THE
REPORTING MONTH**

**APPENDIX D
COMPLAINT LOG**

APPENDIX D – COMPLAINT LOG

Reporting Month: September 2012

Log Ref.	Location	Received Date	Details of Complaint	Investigation/Mitigation Action	Status
COM-2012-08-001	Jetty Area	28-08-2012	A resident in Lohas Park complained about noise nuisance from the site.	Investigation by EPD identified the source to be chiselling work at the jetty area. Although the chisel machines were covered by valid CNP, the Contractor decided to suspend the corresponding work during restricted hours. The machine was later covered by sound proof canvas to minimize noise transmission. Subsequent inspection and noise measurement by the EPD on 3 rd September 2012 concluded that the noise reduction measure was effective and acceptable at Lohas Park.	Closed
COM-2012-09-002	Jetty Area	07-09-2012	A resident in Lohas Park complained about noise nuisance from the site.	Investigation by EPD identified the source to be chiselling work at the jetty area. Only one chisel machine was operated on the day of complain and it was screened by sound proof canvas. Although the machine was covered by valid CNP, the Contractor decided to suspend the corresponding work during restricted hours during investigation period. Subsequent inspection and noise measurement (daytime at site, night time at Lohas Park) by the EPD on 12 th September 2012 concluded that the noise levels were acceptable at Lohas Park.	Closed
COM-2012-09-003	Jetty Area	27-09-2012	A resident in Lohas Park complained about noise nuisance from the site.	The chisel machine used at JP3 of the jetty area was identified as the noise source. According to the Contractor, the machine was screened by sound proof canvas. Although the machine was covered by valid CNP, the Contractor decided to carry out the corresponding work during normal operation hours only. This was agreed with the complainant in Lohas Park.	Closed

Remarks: N/A

APPENDIX E
CONSTRUCTION PROGRAMME

Activity ID	Activity Name	Duration	Start	Finish	2012				2013	
					Sep 11	Oct 12	Nov 13	Dec 14	Jan 15	Feb 16
C270MC-3M-Rolling Programme Ver.2.0 (280912)					22					
Remaining Construction Works					22					
Major Equipment and Material Procurement and Delivery					05-Jan-13, Major Equipment and Materi					
P10010	Procurement of Pipe Bridge Bearings	1	28-Sep-12	05-Jan-13*						
1A - Administration Building					23-Jan-13, 1A - Administra					
Administration Building Structural and Builder's Work					03-Nov-12, Administration Building Structural and Builder's Work					
A17420	AB-Installation of windows, louvers and doors 2nd stage	25	10-Oct-12	03-Nov-12						
AB-Electrical					23-Jan-13, AB-Electrical					
A17142	AB-BS Final Connection (Electrical) (Isolator/MCB board/Wiring accessories)	30	01-Sep-12 A	20-Oct-12						
A17160	AB-BS Installation of switch board and cable termination works in Switch Rooms	40	11-Sep-12 A	24-Oct-12						
A17190	AB-BS Lighting installation works	30	01-Sep-12 A	17-Nov-12						
A17200	AB-Installation of switch board and cable termination works in Main Switch Room	40	11-Sep-12 A	24-Oct-12						
A17210	AB-Installation of Generators, Day Tanks and associated equipment & pipe works	45	21-Sep-12 A	24-Nov-12						
A17610	AB-BS Electrical Testing	60	25-Nov-12	23-Jan-13						
AB-Fire Services					23-Jan-13, AB-Fire Servic					
A17186	AB-BS Cable Final Connection (Fire Services)	30	21-Sep-12 A	21-Nov-12						
A17800	AB-BS Fire Service Testing	60	25-Nov-12	23-Jan-13						
AB-Plumbing and Drainage					26-Dec-12, AB-Plumbing and Drainage					
A17125	AB-BS Wiring and Control (P&D)	45	21-Sep-12 A	07-Nov-12						
A17155	AB-Installation of sanitary fittings	60	28-Sep-12	26-Nov-12						
A17700	AB-BS Plumbing and Drainage Testing	60	27-Nov-12	26-Dec-12						
AB-MVAC					31-Dec-12, AB-MVAC					
A17151	AB-BS Wiring and control installation works (MVAC)	42	22-Sep-12 A	01-Nov-12						
A17220	AB-BS MVAC Testing	60	02-Nov-12	31-Dec-12						
AB-Lift					23-Nov-12, AB-Lift					
A17600	AB-Lift Testing	45	09-Oct-12	23-Nov-12						
1B - Process Building					06-Feb-13, 1B					
Processing Building Structural and Builder's Work					28-Nov-12, Processing Building Structural and Builder's Work					
A18210	PB-Installation of windows, louvers and doors 1st stage	31	24-Sep-12 A	25-Oct-12						
A18220	PB-Installation of windows, louvers and doors 2nd stage	31	25-Oct-12	25-Nov-12						
A18230	PB-ABWF works excluding windows, louvers and doors	62	28-Sep-12	28-Nov-12						
PB-Plumbing and Drainage					29-Dec-12, PB-Plumbing and Drainage					
A18010	PB-BS Piping works (Plumbing)	45	09-Nov-12	08-Dec-12						
A18020	PB-BS Piping works (Drainage)	45	09-Nov-12	08-Dec-12						
A18025	PB-Installation of sanitary fittings	60	09-Dec-12	29-Dec-12						
PB-Electrical					06-Feb-13, PB					
A18030	PB-BS Cable laying works(Electrical) 1st stage	45	09-Nov-12	23-Dec-12						
A18040	PB-BS Cable laying works(Electrical) 2nd stage	45	24-Dec-12	06-Feb-13						
PB-MVAC					06-Feb-13, PB					
A18060	PB-BS Installation of piping and Ducting Works (MVAC)	90	09-Nov-12	06-Feb-13						
PB-Fire Services					27-Jan-13, PB-Fire Se					
A18070	PB-BS Piping installation works (Fire Services)	45	09-Nov-12	07-Jan-13						
A18080	PB-BS Sprinkler installation works (Fire Services)	45	09-Nov-12	07-Jan-13						
A18081	PB-BS Cable laying works	45	23-Nov-12	06-Jan-13						
A18082	PB-BS Final connection works	45	14-Dec-12	27-Jan-13						
PB-Processing Works					25-Jan-13, PB-Processi					

- Actual Work
- Remaining Work
- Critical Remaining Work
- Critical Milestone
- Milestone
- Summary

Proposed Biodiesel Plant at T.K.O.T. Lot 39 Main Contract for All Remaining Works

3 Months Rolling Programme (28 Sep 2012)

Date	Revision	Checked	Approved
28-Sep-12			

Activity ID	Activity Name	Duration	Start	Finish	2012				2013	
					Sep 11	Oct 12	Nov 13	Dec 14	Jan 15	Feb 16
A17900	PB-BDI Pipe insulation, Process Electrical & Instrumentation Works	90	28-Oct-12	25-Jan-13						
1B - Fat Preparation Building					81 01-Sep-12 A 03-Feb-13					
Fat Preparation Structural and Builder's Work					62 04-Nov-12 04-Jan-13					
A19110	FP-Installation of windows, louvers and doors 1st stage	31	04-Nov-12	04-Dec-12						
A19120	FP-Installation of windows, louvers and doors 2nd stage	31	05-Dec-12	04-Jan-13						
FP-Electrical					30 01-Sep-12 A 03-Feb-13					
A19060	FP-BS installation of switch board and cable termination works in Switch Rooms	30	01-Sep-12 A	03-Feb-13						
FP-Fire Services					50 05-Sep-12 A 03-Feb-13					
A19070	FP-BS Piping installation works(Fire Services)	30	05-Sep-12 A	03-Feb-13						
A19080	FP-BS Sprinkler installation works(Fire Services)	30	05-Sep-12 A	03-Feb-13						
1B - Boiler Room					133 05-Sep-12 A 17-Feb-13					
Boiler Room Structural and Builder's Work					112 28-Sep-12 17-Jan-13					
A19800	BR-Cladding Roof Installation	31	19-Oct-12	18-Nov-12						
A19900	BR-Chimney Works	31	19-Oct-12	18-Nov-12						
A20110	BR-Installation of windows, louvers and doors 1st stage	30	19-Nov-12	18-Dec-12						
A20120	BR-Installation of windows, louvers and doors 2nd stage	30	19-Dec-12	17-Jan-13						
A20130	BR-ABWF works excluding windows, louvers and doors	60	19-Nov-12	17-Jan-13						
A20140	BR-Installation of roof waterproofing system works	30	28-Sep-12	27-Oct-12						
BR-Plumbing and Drainage					81 05-Sep-12 A 17-Feb-13					
A20010	BR-BS piping works (Plumbing)	45	05-Sep-12 A	05-Jan-13						
A20020	BR-BS piping works(Drainage)	45	05-Sep-12 A	17-Feb-13						
BR-Fire Services					30 06-Sep-12 A 22-Jan-13					
A20070	BR-BS Piping installation works(Fire Services)	30	06-Sep-12 A	22-Jan-13						
2A - Tank Farm					131 31-Aug-12 A 22-Jan-13					
Tank Farm 2A Structural and Builder's Work					67 31-Aug-12 A 19-Nov-12					
A20630	2A-Erection of tanks in Tank Farm 2A 3rd stage	38	31-Aug-12 A	20-Oct-12						
A21100	2A-ABWF works in Tank Farm 2A	30	20-Oct-12	19-Nov-12						
2A-Plumbing and Drainage					64 19-Nov-12 22-Jan-13					
A20810	2A-BS Piping works(Plumbing) 1st Stage	32	19-Nov-12	21-Dec-12						
A20820	2A-BS Piping works(Plumbing) 2nd stage	32	21-Dec-12	22-Jan-13						
2A - GTW Separation Room					135 27-Sep-12 A 09-Feb-13					
GTWSR Structural and Builder's Work					28 28-Sep-12 25-Oct-12					
A22000	GTWSR-ABWF works including windows, louvers and door but excluding roller shu	28	28-Sep-12	25-Oct-12						
GTWSR-Plumbing and Drainage					59 05-Oct-12 02-Dec-12					
A21910	GTWSR-BS Piping works(Plumbing)	23	05-Oct-12	18-Nov-12						
A21920	GTWSR-BS Piping works(Drainage)	22	05-Oct-12	18-Nov-12						
A22200	GTWSR-BS Plumbing and Drainage Testing	14	19-Nov-12	02-Dec-12						
GTWSR-Electrical					65 05-Oct-12 08-Dec-12					
A21940	GTWSR-BS Cable exposed conduits laying works(Electrical)	22	05-Oct-12	03-Nov-12						
A21950	GTWSR-Lighting installation works	30	12-Oct-12	10-Nov-12						
A21951	GTWSR-BS Final connection works	14	11-Nov-12	24-Nov-12						
A21980	GTWSR-BS Electrical Testing	14	25-Nov-12	08-Dec-12						
GTWSR-Fire Services					37 05-Oct-12 03-Nov-12					
A21959	GTWSR-BS Cable exposed conduits laying works(Fire Services)	21	05-Oct-12	27-Oct-12						
A21960	GTWSR-BS Piping installation works(Fire Services)	23	05-Oct-12	27-Oct-12						
A21970	GTWSR-BS Sprinkler installation works(Fire Services)	22	05-Oct-12	27-Oct-12						
A22020	GTWSR-BS Final connection	21	21-Oct-12	03-Nov-12						

- Actual Work
- Remaining Work
- Critical Remaining Work
- Critical Milestone
- Milestone
- Summary

Proposed Biodiesel Plant at T.K.O.T. Lot 39 Main Contract for All Remaining Works

3 Months Rolling Programme (28 Sep 2012)

Date	Revision	Checked	Approved
28-Sep-12			

Activity ID	Activity Name	Duration	Start	Finish	2012						2013					
					Sep	Oct	Nov	Dec	Jan	Feb	Jan	Feb				
					11	12	13	14	15	16						
GTWSR-Processing Works					135								27-Sep-12 A		09-Feb-13	
A21500	GTWSR-Paques Process Equipment Installation Works	62	27-Sep-12 A	25-Nov-12	[Gantt bar: 27-Sep-12 to 25-Nov-12]											
A21600	GTWSR-Paques Piping, Electrical, Insulation & Instrumentation Works	60	25-Nov-12	24-Jan-13	[Gantt bar: 25-Nov-12 to 24-Jan-13]											
A21700	GTWSR-BDI Unloading Equipment Installation Works	7	25-Nov-12	02-Dec-12	[Gantt bar: 25-Nov-12 to 02-Dec-12]											
A21800	GTWSR-BDI Piping, Electrical, Insulation & Instrumentation Works	45	27-Dec-12	09-Feb-13	[Gantt bar: 27-Dec-12 to 09-Feb-13]											
2B-E Tank Farm					109								31-Aug-12 A		06-Jan-13	
Tank Farm 2B-2E Structural and Builder's Work					53								31-Aug-12 A		12-Nov-12	
A22520	2BE-Erection tanks in Tank Farm 2B-2E 2nd stage	31	31-Aug-12 A	13-Oct-12	[Gantt bar: 31-Aug-12 to 13-Oct-12]											
A23100	2BE-ABWF works in Tank Farm 2B-2E	30	13-Oct-12	12-Nov-12	[Gantt bar: 13-Oct-12 to 12-Nov-12]											
Tank Farm 2B-2E-Plumbing and Drainage					79								20-Oct-12		06-Jan-13	
A22810	2BE-BS Piping works(Plumbing)	32	20-Oct-12	19-Nov-12	[Gantt bar: 20-Oct-12 to 19-Nov-12]											
A22820	2BE-BS Piping works(Drainage)	32	20-Oct-12	19-Nov-12	[Gantt bar: 20-Oct-12 to 19-Nov-12]											
A22900	2BE-BS Plumbing and Drainage Testing	43	25-Nov-12	06-Jan-13	[Gantt bar: 25-Nov-12 to 06-Jan-13]											
Tank Farm 2B-2E-Processing Works					63								28-Sep-12		29-Nov-12	
A22600	2BE-BDI Process Equipment Installation Works	63	28-Sep-12	29-Nov-12	[Gantt bar: 28-Sep-12 to 29-Nov-12]											
3 - Waste Water Treatment Plant					141								20-Sep-12 A		08-Feb-13	
Waste Water Treatment Plant Structural and Builder's Work					51								22-Sep-12 A		19-Nov-12	
A23400	WWTP-IC Reactor Erection	21	29-Sep-12	20-Oct-12	[Gantt bar: 29-Sep-12 to 20-Oct-12]											
A24010	WWTP-Installation of roof waterproofing system	30	22-Sep-12 A	14-Oct-12	[Gantt bar: 22-Sep-12 to 14-Oct-12]											
A24020	WWTP-Installation of windows, louvers and doors	30	20-Oct-12	19-Nov-12	[Gantt bar: 20-Oct-12 to 19-Nov-12]											
A24030	WWTP- ABWF works excluding windows, louvers and doors	30	20-Oct-12	19-Nov-12	[Gantt bar: 20-Oct-12 to 19-Nov-12]											
WWTP-Plumbing and Drainage					78								20-Sep-12 A		13-Jan-13	
A23610	WWTP-BS piping works(Plumbing)	30	20-Sep-12 A	22-Nov-12	[Gantt bar: 20-Sep-12 to 22-Nov-12]											
A23620	WWTP-BS piping works(Drainage)	30	20-Sep-12 A	22-Nov-12	[Gantt bar: 20-Sep-12 to 22-Nov-12]											
A23655	WWTP-BS Installation of sanitary fittings	22	22-Nov-12	14-Dec-12	[Gantt bar: 22-Nov-12 to 14-Dec-12]											
A23800	WWTP-BS Plumbing and Drainage Testing	30	14-Dec-12	13-Jan-13	[Gantt bar: 14-Dec-12 to 13-Jan-13]											
WWTP-Electrical					78								27-Oct-12		13-Jan-13	
A23640	WWTP-BS Cable exposed conduits laying works (Electrical)	30	27-Oct-12	26-Nov-12	[Gantt bar: 27-Oct-12 to 26-Nov-12]											
A23650	WWTP-BS Lighting installation works	22	26-Nov-12	18-Dec-12	[Gantt bar: 26-Nov-12 to 18-Dec-12]											
A23651	WWTP-BS Final connection works	21	02-Dec-12	01-Jan-13	[Gantt bar: 02-Dec-12 to 01-Jan-13]											
A23680	WWTP-BS Electrical Testing	22	22-Dec-12	13-Jan-13	[Gantt bar: 22-Dec-12 to 13-Jan-13]											
WWTP-Fire Services					89								27-Oct-12		24-Jan-13	
A23670	WWTP-BS Sprinkler installation works(Fire Services)	30	27-Oct-12	11-Dec-12	[Gantt bar: 27-Oct-12 to 11-Dec-12]											
A23720	WWTP-BS Cable exposed conduits laying works(Fire Services)	14	27-Nov-12	11-Dec-12	[Gantt bar: 27-Nov-12 to 11-Dec-12]											
A23730	WWTP-BS Final connection works(Final Services)	14	11-Dec-12	25-Dec-12	[Gantt bar: 11-Dec-12 to 25-Dec-12]											
A23900	WWTP-Fire Service Testing	30	25-Dec-12	24-Jan-13	[Gantt bar: 25-Dec-12 to 24-Jan-13]											
WWTP-Processing Works					90								24-Sep-12 A		08-Feb-13	
A23500	WWTP-Treatment Equipment Installation Works	90	24-Sep-12 A	08-Feb-13	[Gantt bar: 24-Sep-12 to 08-Feb-13]											
4A - Jetty					148								06-Oct-12		22-Feb-13	
Jetty Structural and Builder's Work					148								06-Oct-12		22-Feb-13	
A24140	4A-Construct upto 10 nos of Jetty Bored Piles	28	06-Oct-12	03-Nov-12	[Gantt bar: 06-Oct-12 to 03-Nov-12]											
A24210	4A-Construct upto 14 nos of Jetty Bored Piles	28	24-Oct-12	21-Nov-12	[Gantt bar: 24-Oct-12 to 21-Nov-12]											
A24215	4A-Submit BA14 for Pile Works	14	21-Nov-12	05-Dec-12	[Gantt bar: 21-Nov-12 to 05-Dec-12]											
A24220	4A-Piles Test	21	28-Nov-12	19-Dec-12	[Gantt bar: 28-Nov-12 to 19-Dec-12]											
A24310	4A-Pile Cap and Superstructure of Jetty Deck concreting works	74	19-Dec-12	22-Feb-13	[Gantt bar: 19-Dec-12 to 22-Feb-13]											
Pipe Bridge & Pipe Trench Works					150								28-Sep-12		25-Jan-13	
A24910	Erection of steel pipe racks at Tank Farm 2A & GTWSR (Tower 3 & PB type H)	30	28-Sep-12	27-Oct-12	[Gantt bar: 28-Sep-12 to 27-Oct-12]											

█ Actual Work ◆ Critical Milestone
█ Remaining Work ▬ Milestone
█ Critical Remaining Work ▬ Summary

Proposed Biodiesel Plant at T.K.O.T. Lot 39 Main Contract for All Remaining Works

3 Months Rolling Programme (28 Sep 2012)

Date	Revision	Checked	Approved
28-Sep-12			

Activity ID	Activity Name	Duration	Start	Finish	2012						2013		
					Sep	Oct	Nov	Dec	Jan	Feb			
					11	12	13	14	15	16			
A24920	Erection of pipe bridge between Tank Farm 2A and Tank Farm 2B-2E (Tower 2 & P	30	21-Dec-12*	19-Jan-13									
A24930	Erection of steel pipe racks at Tank Farm 2B-2E (Tower 1 & PB 7)	30	28-Sep-12	26-Nov-12									
A25100	Pipe Trench from WWTP to Jetty	60	27-Dec-12	25-Jan-13									
External Works		142	28-Sep-12	17-Feb-13									
External Drainage Works		142	28-Sep-12	17-Feb-13									
Storm water manhole and pipe works		110	28-Sep-12	25-Jan-13									
A25240	Storm water manhole works 4th stage	50	28-Sep-12	26-Nov-12									
A25250	Storm water manhole works 5th stage	50	28-Oct-12	26-Dec-12									
A25260	Storm water manhole works 6th stage	50	27-Nov-12	25-Jan-13									
Foul water manhole and pipe works		120	20-Oct-12	17-Feb-13									
A25300	Faul Water manhole and the pipe works between the manholes with the associated	60	20-Oct-12	19-Dec-12									
A25310	Faul Water manhole and the pipe works between the manholes with the associated	60	19-Nov-12	18-Jan-13									
A25320	Faul Water manhole and the pipe works between the manholes with the associated	60	19-Dec-12	17-Feb-13									
External Pumping Works		120	28-Sep-12	25-Jan-13									
Salt water main installation works		120	28-Sep-12	25-Jan-13									
A25570	Installation of external salt watermain 4th stage	60	28-Sep-12	26-Nov-12									
A25580	Installation of external salt watermain 5th stage	60	28-Oct-12	26-Dec-12									
A25590	Installation of external salt watermain 6th stage	60	27-Nov-12	25-Jan-13									
Fresh water main installation works		120	28-Sep-12	25-Jan-13									
A25540	Installation of external fresh watermain 4th stage	60	28-Sep-12	26-Nov-12									
A25550	Installation of external fresh watermain 5th stage	60	28-Oct-12	26-Dec-12									
A25560	Installation of external fresh watermain 6th stage	60	27-Nov-12	25-Jan-13									
Fire Services Works		120	28-Sep-12	25-Jan-13									
A25470	External - Fire Services pipe works 4th Stage	60	28-Sep-12	26-Nov-12									
A25480	External - Fire Services pipe works 5th Stage	60	28-Oct-12	26-Dec-12									
A25490	External - Fire Services pipe works 6th Stage	60	27-Nov-12	25-Jan-13									
External Service Cable Works		120	16-Oct-12	12-Feb-13									
A25710	Exteranal cable duct and draw pits instalation works 4th stage	60	16-Oct-12	14-Dec-12									
A25720	Exteranal cable duct and draw pits instalation works 5th stage	60	15-Nov-12	13-Jan-13									
A25730	Exteranal cable duct and draw pits instalation works 6th stage	60	15-Dec-12	12-Feb-13									
Road Works		31	22-Oct-12	19-Jan-13									
A25640	Road Works with associated surface channels and catch pits 4th stage	1	22-Oct-12	20-Dec-12									
A25650	Road Works with associated surface channels and catch pits 5th stage	1	21-Nov-12	19-Jan-13									
Boundary Wall Construction Works		39	28-Sep-12	05-Nov-12									
A25530	Boundary Wall-ABWF works	39	28-Sep-12	05-Nov-12									
Water Supply Works		78	09-Nov-12	25-Jan-13									
A25700	WSD pipe laying Works	78	09-Nov-12	25-Jan-13									

- Actual Work
- Remaining Work
- Critical Remaining Work
- Critical Milestone
- Milestone
- Summary

Proposed Biodiesel Plant at T.K.O.T. Lot 39 Main Contract for All Remaining Works

3 Months Rolling Programme (28 Sep 2012)

Date	Revision	Checked	Approved
28-Sep-12			

**APPENDIX F
INCIDENT REPORT FOR BENTONITE
LEAKAGE IN BORED PILE JP13**



China Harbour Engineering Company Limited

**Proposed Biodiesel Plant at
T.K.O.T. Lot No. 39 S.Q ss.1, ss.2 and Ext. thereto
Chun Wang Street, Tseung Kwan O Ind. Estate, kln.**

**Incident Report
for
Incident Report for Bentonite Leakage in Bored Pile JP13**

October 2012



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1 INTRODUCTION

1.1 General

China Harbour Engineering CO. Ltd. (CHEC) is to construct a jetty for a biodiesel plant at Tseung Kwan O. The jetty is 63.5m long by 17.3m wide supported by 14 nos. of 2m diameter bored pile (Pile No.: JP1~ JP14).

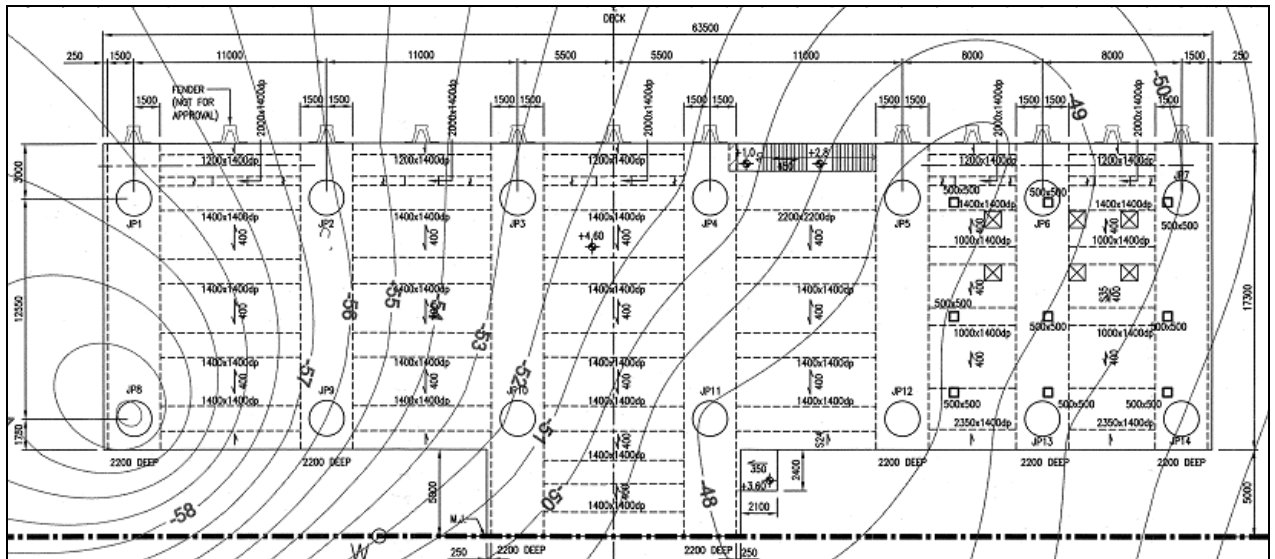


Figure 1 – Piling Layout Plan

On 29 September 2012, concreting works was carried out for Bored Pile JP13. During the concreting works, leakage of bentonite slurry was reported. Although some bentonite slurry fell to the sea, no contamination was found beyond the silt curtain area.

1.2 Purpose of this Document

This document is prepared to:-

- 1) Explain the non-conformity of the bentonite leakage during the concreting works in Bored Pile JP13 ; and
- 2) Proposed precautionary measures to avoid leakage of bentonite.

2 BACKGROUND INFORMATION

2.1 Construction of the Proposed Bored Pile

To construct the bored pile, the construction sequence is outlined as below:-

1. Remove surface rock armour to facilitate the installation of piles.
2. Lay temporary casing (2600mm diameter).
3. Pre-bore and drive the temporary casing to -15mPD by chisel hammer and vibro hammer.
4. Install permanent casing (2200mm diameter) and pile sleeve within the temporary casing.
5. Remove the temporary casing and backfill the gap by aggregate and sand.
6. Carry out shaft excavation within the marine sand / alluvium region by auger. Bentonite slurry will be used as boring fluid to stabilize the bored hole.
7. Carry out shaft excavation in the natural rock region and down to the tentative founding level by means of chisel method.
8. Install reinforcement cage.
9. Clean the bored hole again.
10. Concreting by underwater tremie method.

2.2 Precautionary Measures

To minimize the impact of the construction works, the following precautionary measure was implemented on site:-

1) Silt Curtain

According to the EIA report, silt curtain was required to implement around the marine piling area to contain any suspended mud and sediments generated during the construction works.



Figure 2 – Silt Curtain which Installed Onsite

2.3 Non-conformity Report

A non-conformity report regarding bentonite leakage during the concreting works of bored pile JP13 was received from the site supervision's staff dated 29 September 2012.

It was reported that:-

- Leakage was found in the flow-back channel between the bored pile JP13 and the bentonite storage tank.

2.4 Cause of the Incident

On 29 September 2012, concreting works for bored pile JP13 was carried out. Prior to the concreting works, the initial level of bentonite slurry in JP13 was reduced by approx. 1.5m to cater for the rapid displaced bentonite slurry caused by the first batch of approx. 5m³ concrete that initially stored in the funnel. However, leakage was found through the crack in the flow-back channel between the bored pile JP13 and the bentonite storage tank (see Figure 3 for the flow path of displaced bentonite slurry).

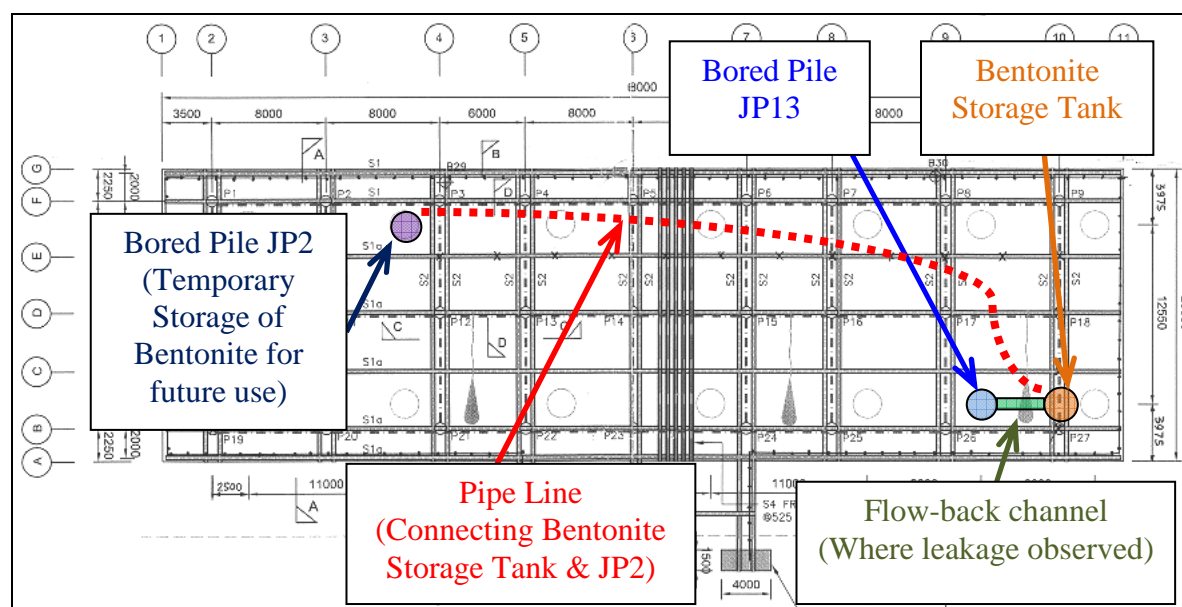


Figure 3 – Layout Plan of Flow Path of Displaced Bentonite Slurry

Further to the investigation, the leakage was caused by:-

1. Poor workmanship of the welding joint of the flow-back channel where cracks were found.
2. Rapid increase of the bentonite level in the JP13 and in the flow-back channel which caused by the first batch of concrete (5m³).
3. Due to the long pumping distance, the pump rate of the control pump at the storage tank would not catch up with the displace rate of the bentonite slurry.

3 PROPOSED PRECAUTIONARY MEASURES

3.1 Inspection of the Flow-back Channel

Prior to the concreting works, an inspection will be carried out for the back flow channel. A trial test run by fresh water will be adopted to check for the cracks. If crack was found, the crack will be properly sealed so as to avoid any potential leakage.

3.2 Reduce the Initial Level of Bentonite Slurry in the Pile

For the first batch of concrete infill which stored in the funnel, its amount is approx. 5m^3 . To cater for the rapid displaced bentonite slurry caused by this 5m^3 concrete infill, the initial level of bentonite slurry in the pile will be reduced prior to the concreting works.

For a 5m^3 concrete infill, the displaced height of bentonite slurry in the 2176mm ID casing is:

$$\begin{aligned} &= 5 / (2.176^2 \times \pi / 4) \\ &= 5 / 3.72 \\ &= 1.34\text{m} \end{aligned}$$

Therefore, prior to the concreting works, the initial level of bentonite slurry in the pile will be reduced by minimum 2m.

3.3 Control the Concrete Infill Rate

To monitor the pump rate of the control pump at the storage tank catch up with the displace rate of the bentonite slurry, the concrete infill rate will be closely monitor.

In the storage tank, a line that is 0.3m below the invert level of the flow back channel will be marked. To reduce the risk of overflow, once the displaced bentonite slurry reaches this line, we will lower the concrete infill rate.