Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung

Environmental Monitoring & Audit (EM&A) Final EM&A Report

(Report No. 382210/FIN/001)

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Table of Content

List of Figure

List of Table

List of Annex

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Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung
(Independent Environmental Checker)

CHECK CERTIFICATE

1. We certify that professional skill and care have been used in checking of the Environmental Team's (ET) **Final EM&A Report** for the construction of Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung.

2. We certify that the ET's EM&A programme for the reporting period has been satisfactorily executed and the **Final EM&A Report** has been verified.

3. We would comment that our evaluation of the ET's EM&A is based on a random audit process which cannot be guaranteed to have all non-conformities identified.

Signed 

_____
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Executive Summary

This is the Final Environmental Monitoring and Audit (EM&A) Report prepared by Black & Veatch, the designated Environmental Team (ET), for the Project "Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung". The construction works of golf course was commenced on 16th January 2006. Major golf course construction was completed in December 2007. This final report presents the summary of EM&A monitoring results conducted for 24 months during construction phase (January 2006 to January 2008).

No dredging of the permanent intake and outfall pipelines for the desalination plant had been carried out during construction phase. Both pipelines were constructed along the KSC existing pier. The discharge licence application for the desalination plant is in progress. 89 numbers of corals located on the footprint of the pipelines were transplanted to at least 80m away from the KSC existing pier (near Site D2) in according to EIA report and EM&A manual.

All of the closed low flow drainage system was constructed and completed in November 2007 in order to collect all surface runoff from third golf course during operation phase. Filter system were installed at Holes 5 & 6 in according to the Environmental Permit (EP). All four permanent bridges were constructed by pre-cast method on site.

Exceedances on dust (24-hr TSP) and water quality (mainly suspended solids and turbidity) were recorded. However, all measured pesticides concentrations at all fresh water and marine monitoring stations were undetectable since turf establishment in February 2007.

Several incidents were occurred at buffer zone of streams during construction, they are (i) artificial rubble filling up downstream of Stream A after rain, (ii) additional vegetation clearance at Streams B & C and (iii) heavy silt deposit at the streambed of Stream C. All stream conditions are considered back to the baseline condition except Stream C. For Stream C, two species of Atyid shrimps, i.e. *Caridina fasciata* and *Cardina cantonensis*, which had been absent in June 2007, were found but still in very low density since November 2007.

The removal of the rock-filled pier at the temporary barging point will be commenced on 12th February 2008 for one month. Due to the coral damage incident occurred in March 2006 during the construction of the temporary barging point, additional coral monitoring are recommended by AFCD during the period of removal. If there is an extension of the removal programme due to any coral damage, further review on the coral monitoring frequency is required and will be submitted for AFCD and EPD for approval.

For air quality (dust nuisance), EPD issued two numbers of Record of Inspection (Pink Form) in January and May 2007 under Air Pollution Control Ordinance (APCO) to the Contractor (CHEC). In addition, two numbers of complaints issued by golfers due to dust nuisance were recorded in September 2006 and September 2007.

For water quality (silty runoff), EPD issued one number of Record of Inspection (Pink Form) under Water Pollution Control Ordinance (WPCO) to the CHEC in June 2006. In addition, two numbers of complaints issued by fish pond holder (Tiu Cham Wan) in March 2006 and Tai Tau Chau fish farmers were recorded. According to the EPD's record, CHEC was convicted for breaching the WPCO in November 2006.

Provision of buffer zone and pre-cast bridge construction are good successful examples to minimize the impact on sensitive stream. Works to be carried out in dry season within buffer zone as stated in EP can further minimize the potential impact.

Long-term water quality exceedances were found, in particular wet season, which was mainly due to the failure and insufficient of the temporary drainage implemented on site. It is important to note that a comprehensive, frequently update/review, highly maintain and effective temporary drainage system is the best management and practical tool to control silty runoff. Careful planning on bulky earthworks works programme is also the key success to control the silty runoff from construction site.

Temporary adverse impacts on air quality, water quality, terrestrial ecology and marine ecology were found after revealing two-year construction phase EM&A monitoring. It is also important to learn that the Contractor should follow all EIA recommendations, implemented mitigation measures before any work approach to environmental sensitive areas and modify/enhance mitigation measures due to the site constraints and conditions, if necessary in order to minimize and avoid any adverse impact to the environment.

According to the site inspection and site audit records, the Contractor was generally in compliance with environmental requirements except incidents causing buffer zone disturbance and coral damage at temporary barging point. However, the effectiveness and practicality of the mitigation measures provided by the Contractor were considered not sufficient during the construction phase.

1. Introduction

1.1 Background of the Project

1.1.1 Black & Veatch (hereinafter called the "ET") was appointed by Hong Kong Jockey Club (hereinafter called the "Project Proponent") to undertake Environmental Monitoring and Audit (EM&A) for "Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung" (hereinafter called the "Project"). Under the requirements of Section 4 of Environmental Permit EP-224/2005, EM&A programme as set out in the EM&A Manual is required to be implemented. In accordance with the EM&A Manual, environmental monitoring of air quality, water quality, terrestrial and marine ecology, landscape and visual, archaeology (watching brief) and land contamination are required for the Project during the construction phase.

1.2 Purpose of the Report

1.2.1 This final EM&A review report summarises the environmental monitoring and audit reports for the Project after 24 months monitoring (January 2006 to December 2007) and one month post-Project monitoring (January 2008).

1.3 Scale and Scope of the Project

1.3.1 The scale and scope of the Project comprises the following major components:

- Construction of the third 18-hole public golf course on the east side of the island, south of the existing golfing area;
- A new irrigation lake to collect surface runoff from the new 18-hole golf course. Water stored at the new irrigation lake can also be diverted to existing reservoir for tertiary treatment and recycling;
- A new desalination plant adjacent to the existing pier to serve as an additional irrigation water supply for the new golf course during dry season; and
- Expansion of existing administration and maintenance buildings.

1.3.2 The potential environmental impacts of the Project have been studied in the Environmental Impact Assessment (EIA) report (EIAO Register No. AEIAR- 091/2005). The EIA was approved on 14 November 2005 under the EIAO. An Environmental Permit (EP-224/2005) was granted on 28 November 2005. Application for Variation of an Environmental Permit by the Project Proponent on 2 August 2006 (Application No. VEP-222/2006) and the EP was superseded by EP-224/2005/A.

1.4 Site Description

1.4.1 A layout plan of the Project is provided in **Figure 1.1**.

1.5 Project Organization and Management Structure for EM&A Works

1.5.1 An environmental team (ET) has been established to investigate and audit the Contractor's equipment and work methodologies, to monitor and to audit reports, and to provide recommendations and improvements. An Independent Environmental Checker (IEC) has been employed to review the EM&A works by the Project Proponent. The Engineer is generally responsible for supervising the contractor's activities, reviewing the EM&A works and mitigations. The organization and lines of communication are shown in **Figure 1.2**.

1.6 Construction Programme

1.6.1 The construction works were commenced on 16 January 2006 and the major construction activities were completed by the end of December 2007.

1.7 Works under during the Construction Period

1.7.1 The major construction activities and works undertaken during the entire construction period where as follows:

- Construction of 18 hole of golf course;
- Construction of close low flow drainage system including irrigation lakes, pumping stations and underground water tanks;
- Construction of temporary barging point at east side of the KSC Island;
- Construction of desalination plant located at the existing KSC pier;
- Extension of existing administration and maintenance buildings;
- Upgrading of existing sewage treatment plant;
- Construction of bridges at Streams A, B, C and fresh water inland marsh; and
- Turf establishment.

2. Summary of EM&A Requirements

2.1.1 The EM&A programme requires environmental monitoring for air quality, water quality, terrestrial and marine ecology, landscape and visual, archaeology (watching brief) and land contamination. The EM&A requirements for each parameter are described in subsequent sections, including:

- All monitoring parameters;
- Action and Limit Levels for all environmental parameters;
- Event and Action Plans; and
- Environmental mitigation measures, as recommended in the project EIA final report.

2.1.2 A summary of impact EM&A requirements during the construction phase is presented in **Annex A**.

2.1 Air Quality

2.1.3 The established Action/Limit Levels (AL levels) for the 1-hour and 24-hour TSP monitoring works are summarized in **Annex B**. The monitoring parameters and frequency are summarized in **Table 2.1**.

Table 2.1 TSP Monitoring Parameter and Frequency

Parameter	Frequency
24-hour TSP	Once every 6 days
1-hour TSP	3 times every 6 days (as required in case of complaints)

2.1.4 In accordance with the EM&A Manual, one monitoring station (GCA B1) was selected and shown in **Figure 2.1**. The Event and Action Plan (EAP) for air quality monitoring is presented in **Annex C**.

2.2 Water Quality

2.2.1 The established Action/Limit Levels for the water environmental monitoring parameters are shown in **Annex B**.

2.2.2 There are nine marine water monitoring stations include fish culture zones (TTC, KLW, KS), impact stations (M_RO1, M_Marsh, M_Coral and M_BP) and control (M_A and M_B). Seven fresh water monitoring stations include Streams A, B, C (F_UA, F_DA, F_UB, F_DB, F_UC and F_DC) and downstream of Fresh Water Inland Marsh (F_Inland M). Their respective locations are shown in **Figure 2.2**.

2.2.3 The monitoring parameters and frequency are summarized in **Table 2.2**. Additional marine and freshwater water quality monitoring parameters for the impact monitoring during construction include nitrate nitrogen (NO_3-N), nitrite nitrogen (NO_2-N), ammonia nitrogen (NH_3-N), total phosphate (TP) and selected pesticides.

2.2.4 Additional water quality monitoring at Tai Tau Chau FCZ (TTC), Kai Lung Wan FCZ (KLW), Kau Sai FCZ (KS), downstream of the existing marsh (M_Marsh), marine water of Port Shelter (M_Coral), existing reservoir (F_Inland M) and Control stations (M_A and M_B) shall be carried out after heavy rain storm or when there is an overflow event from the reservoir, irrigation buffer lake or detention ponds/tanks.

2.2.5 The Event and Action Plan (EAP) for water quality monitoring is presented in **Annex C**.

Table 2.2 Water Quality Monitoring Parameter, Frequency and Locations

Parameters	Frequency	Location
Dissolved Oxygen (mg/L)	**3 days per week** Marine water : 2 times per day – 1 for mid-flood and 1 for mid-ebb Freshwater : once per day	**Marine Water** Fish culture zone stations: TTC, KLW, KS Control stations: M_A, M_B Impact stations: M_BP, M_RO1, M_Marsh, M_Coral **Freshwater Water** Stream A (F_UA, F_DA) Stream B (F_UB, F_DB) Stream C (F_UC, F_DC) Inland Marsh (F_lnland_M)
Temperature (ºC)		
Turbidity (NTU)		
pH		
Salinity (ppt)		
Suspended Solids (mg/L)		

2.3 Ecology

2.3.1 The ecological monitoring survey for terrestrial ecology consists of aquatic fauna survey at Streams A, B, C & D (control station). Special attention was paid to ecologically sensitive streams to ensure minimum damage to existing vegetation and streams. The purpose of the monitoring survey was to check the conditions of the stream habitat and the associated aquatic fauna communities.

2.3.2 While the ecological monitoring survey for marine ecology includes coral monitoring at both the eastern (Site B2, Site C and Control Site) and western coasts (Site D2 and Site D3) of Kau Sai Chau Island. The coral monitoring at the western coast was not conducted because of the cancellation of dredging works for the desalination plant's submarine pipelines. The coral monitoring at the eastern Kau Sau Chau was conducted during construction phase. Monitoring survey consists of checking tagged corals at both impact sites and control site. The purpose of the monitoring survey was to check the conditions of the tagged corals and the impact sites. Although the dredging works for the desalination plant have yet to conduct, 89 natural corals near the plant were transplanted near to Site D2 in November 2006. The transplanted corals would be monitored quarterly for a year.

2.3.3 Monitoring locations for ecology are shown in **Figures 2.3 – 2.5**. The Event and Action Plan (EAP) for ecology monitoring is presented in **Annex C**.

2.4 Landscape and Visual

2.4.1 The EIA concluded that the landscape and visual impacts associated with the construction of the third golf course are anticipated to be acceptable with mitigation. In order to ensure that the effective management and implementation of landscape mitigation measures developed and defined in the EIA, the ET conducted regular site inspections of the construction work sites.

2.4.2 Auditing inspections and reporting are undertaken once every two weeks of the construction phase. The effectiveness of the mitigation works has been audited in order to ensure impact reduction levels are achieved as described in the EIA report.

2.5 Archaeology (Graves and Watching Brief)

2.5.1 The archeological impact assessment conducted in the EIA concluded that some potential for archaeological material remains at the Wan Chai Archaeological Site and a watching brief is recommended during the construction phase.

2.5.2 The monitoring locations include Hole 2, Hole 11, Hole 12, Hole 14, Hole 15 & Hole 16. The monitoring locations are present in **Figure 2.6**. A summary table for categories of archaeological find and recommended action is presented in **Annex C**.

2.5.3 The graves located within the Project area were identified in the EIA. According to the EM&A requirement, Grave #1 should be preserved in-situ with the provision of three meter buffer zone around the grave located at Hole 12 fairway, while Grave #5 and Grave #20 should be preserved by record

2.6 Land Contamination

2.6.1 Contamination Assessment Plan (CAP) was submitted to EPD for approval before site investigation. As land contamination at Hole 18 was confirmed by the site investigation, submission of a Contamination Assessment Report (CAR) including Remediation Assessment Plan (RAP) was required and both of them were approved during the construction phase. Potential five land contamination hotspots are presented in **Figure 2.7**.

2.7 Summary of implementation status

2.7.1 An implementation schedule of environmental mitigation measures is shown in **Annex D**.

3. Graphical Plots and Statistical Analysis of Monitored Parameters

3.1 Major activities being carried out on site

3.1.1 The major construction activities and approximate time frame being carried out during the construction phase is shown in **Table 3.1**. **Table 3.2** presents the summary of earthworks and turfing sequence.

Table 3.1 Summary of Construction Programme

Construction Activities	Approximate Time Frame
Construction of 18 hole of golf course	
(I) Earthworks and close low flow drainage systems	
Northern Portion	
Hole 1	January 2006 to October 2007 (21 months)
Hole 2	January 2006 to November 2007 (23 months)
Hole 3	May 2006 to June 2007 (14 months)
Hole 4	May 2006 to February 2007 (9 months)
Hole 5	May 2006 to March 2007 (10 months)
Hole 6	July 2006 to April 2007 (9 months)
Hole 7	July 2006 to May 2007 (10 months)
Hole 8	March 2006 to February 2007 (11 months)
Central Portion	
Hole 9	February 2006 to October 2007 (21 months)
Hole 10	July 2006 to September 2007 (14 months)
Hole 17	February 2006 to October 2007 (21 months)
Hole 18	April 2006 to July 2007 (15 months)
Southern Portion	
Hole 11	September 2006 to June 2007 (10 months)
Hole 12	September 2006 to August 2007 (11 months)
Hole 13	December 2006 to July 2007 (7 months)
Hole 14	October 2006 to July 2007 (10 months)
Hole 15	September 2006 to July 2007 (11 months)
Hole 16	September 2006 to July 2007 (10 months)
(II) Turf Establishment	
Northern Portion	
Hole 1	October to November 2007 (2 months)
Hole 2	November to December 2007 (1.5 month)
Hole 3	June to July 2007 (1 month)
Hole 4	April to July 2007 (3 months)
Hole 5	March to July 2007 (5 months)
Hole 6	May to July 2007 (3 months)
Hole 7	June to July 2007 (2 months)
Hole 8	February to July 2007 (6 months)
Central Portion	
Hole 9	October to December 2007 (3 months)
Hole 10	September to October 2007 (2 months)
Hole 17	October to December 2007 (3 months)
Hole 18	July to October 2007 (3 months)
Southern Portion	
Hole 11	June to August 2007 (3 months)
Hole 12	September to October 2007 (2 months)
Hole 13	August to October 2007 (3 months)
Hole 14	August to September 2007 (2 months)
Hole 15	July to August 2007 (2 months)
Hole 16	August to October 2007 (3 months)

Construction Activities	Approximate Time Frame
Construction of close low flow drainage system including irrigation lakes, pumping stations and underground water tanks	May 2006 to October 2007
Construction of temporary barging point at east side of the KSC Island	March 2006 to April 2006
Construction of desalination plant located at the existing KSC pier (no dredging activity being carried out for submarine pipelines)	June 2006 to December 2006
Extension of existing maintenance and administration buildings	March 2006 to June 2007 (maintenance) March 2006 to August 2007 (administration)
Construction of bridges at Streams A, B, C and fresh water inland marsh (VEP for bridge construction within wet season was approved in August 2006)	March 2006 (Stream A), September 2006 (Stream B), December 2006 (Stream C), August 2006 (Fresh Water Inland Marsh)

Table 3.2 Summary of Earthwork and Turfing Sequence of East Course

	Golf Hole																	
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
January 2006																		
February 2006	**E**	**E**																
March 2006	**E**	**E**							**E**								**E**	
April 2006	**E**	**E**						**E**	**E**								**E**	
May 2006	**E**	**E**	**E**		**E**			**E**	**E**								**E**	**E**
June 2006	**E**	**E**	**E**	**E**	**E**			**E**	**E**								**E**	**E**
July 2006	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**							**E**	**E**
August 2006	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**							**E**	**E**
September 2006	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**							**E**	**E**
October 2006	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**		**E**		**E**	**E**	**E**
November 2006	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**		**E**	**E**	**E**	**E**	**E**
December 2006	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**		**E**	**E**	**E**	**E**	**E**
January 2007	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**
February 2007	**E**	**E**	**E**	S	**E**	S	**E**	***t***	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**
March 2007	**E**	**E**	**E**	S	***t***	S	**E**	***t***	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**
April 2007	**E**	**E**	**E**	***t***	***t***	S	**E**	***t***	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**
May 2007	**E**	**E**	**E**	***t***	***t***	***t***	S	***t***	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	**E**	S
June 2007	**E**	**E**	**E**	***t***	***t***	***t***	***t***	***t***	**E**	**E**	S	**E**	**E**	**E**	**E**	**E**	**E**	S
July 2007	**E**	**E**	***t***	***t***	***t***	***t***	***t***	***t***	**E**	**E**	***t***	S	S	S	S	**E**	**E**	S
August 2007	**E**	**E**	***t***	***t***	***t***	***t***	***t***	***t***	**E**	S	***t***	S	***t***	***t***	***t***	S	**E**	***t***
September 2007	S	**E**	***t***	***t***	***t***	***t***	***t***	***t***	S	***t***	***t***	***t***	***t***	***t***	***t***	***t***	**E**	***t***
October 2007	***t***	**E**	***t***	***t***	***t***	***t***	***t***	***t***	S	***t***	***t***	***t***	***t***	***t***	***t***	***t***	S	***t***
November 2007	***t***	S	***t***	***t***	***t***	***t***	***t***	***t***	***t***	***t***	***t***	***t***	***t***	***t***	***t***	***t***	***t***	***t***
December 2007	***t***	***t***	***t***	***t***	***t***	***t***	***t***	***t***	***t***	***t***	***t***	***t***	***t***	***t***	***t***	***t***	***t***	***t***

Remarks:
E means earthworks (vulnerable to silty runoff and dust generation)
S means sand capping (less vulnerable to silty runoff and dust generation)
t means Planting with Turf

Air Quality

3.1.2 Summary of graphical presentation for 24-hr TSP measured at GCA B1 during the construction phase is presented in **Annex E**.

Water Quality

3.1.3 Summary of graphical presentation for water quality monitored at (i) nine marine water monitoring stations include fish culture zones (TTC, KLW, KS), impact stations (M_RO1, M_Marsh, M_Coral and M_BP) and control (M_A and M_B) and (ii) seven fresh water monitoring stations include Streams A, B, C (F_UA, F_DA, F_UB, F_DB, F_UC and F_DC) and downstream of Fresh Water Inland Marsh (F_Inland M) during the construction phase is presented in **Annex E**.

Ecology

3.1.4 Baseline conditions of (i) Streams A, B, C & D, (ii) tagged corals at Site B2, Site C and Control Site and (iii) transplanted corals recorded in December 2005 and after golf course / desalination plant construction are presented in **Annex E**.

Landscape and Visual

3.1.5 Summary of the site audit results for the landscape and visual is presented in **Annex E**. The compensatory tree planting is still on-going at East Course.

Archaeology

3.1.6 Summary of the (i) watching brief monitoring results at Hole 2, Hole 11, Hole 12, Hole 14, Hole 15 & Hole 16 and (ii) cartographic and photographic survey of Grave no.20 are summarized in **Annex E**.

Land Contamination

3.1.7 Summary of land contamination site investigation, assessment report and remediation action plan is presented in **Annex E**.

3.2 Weather conditions

3.2.1 According to the Hong Kong Observatory record, 19 days of rainstorm events were hoisted on 24 April 2006, 28 April 2006, 2 May 2006, 3 May 2006, 2 June 2006, 9 June 2006, 13 June 2006, 8 Jul 2006, 16 July 2006, 10 August 2006, 9 September 2006, 13 September 2006, 21 November 2006, 24 April 2007, 19 May 2007, 10 June 2007, 28 June 2007, 6 August 2007 and 22 August 2007 during the construction phase. There are 63% and 37% are dry days and wet days respectively. In most of the cases, the total daily rainfall records were less than 40 mm (88%).

3.3 Other factors might affect the monitoring results

3.3.1 The construction site is confined within Kau Sai Chau adjacent to the existing golf courses. There is no other major construction activity being carried out near to the construction site during the construction phase.

4. Summary of Environmental Quality Performance

4.1.1 Non-compliance (exceedances) for air quality and water quality are identified during the construction phase. Summary of action and limit levels exceedances are shown in this section.

Air Quality

4.1.2 There are 7 action levels (4 April 2006, 1 November 2006, 10 November 2006, 2 February 2007, 14 February 2007, 13 April 2007, 18 May 2007) and 1 limit level (2 April 2007) exceedances of 24-hour TSP recorded at the GCA B1.

Water Quality

4.1.3 The action and limit levels exceedances of dissolved oxygen (DO), pH, turbidity, suspended solids (SS) exceedances for marine and fresh water monitoring stations are summarized in **Tables 4.1 and 4.2**.

Table 4.1 Summary of Action and Limit Level Exceedance (Marine Water – In situ)

Monitoring Station	No. of Exceedances of Action Level (AL) and Limit Level (LL)								
	DO (Surface & Middle)		DO (Bottom)		pH	Turbidity		SS	
	AL	LL	AL	LL	AL/LL	AL	LL	AL	LL
Total no. of water sample taken during construction phase = 994									
M_RO1	0	0	0	0	0	3	2	7	1
KLW	6	1	2	0	0	2	1	20	7
M_Marsh	0	0	1	1	0	8	13	11	11
TTC	7	1	2	0	0	8	4	18	13
M_BP	0	0	0	0	0	4	5	7	5
M_Coral	0	0	0	0	0	6	0	8	0
KS	6	0	0	0	0	2	0	17	6
Sub-total	19	2	5	1	0	33	25	88	43
Project-related	**0**	**0**	**0**	**0**	**0**	**10**	**22**	**13**	**26**
Non Project-related	19	2	5	1	0	23	3	75	17

Table 4.2 Summary of Action and Limit Level Exceedance (Fresh Water – In situ)

Monitoring Station	No. of Exceedances of Action Level (AL) and Limit Level (LL)						
	DO		pH	Turbidity		SS	
Total no. of water sample taken during construction phase = 858							
	AL	LL	AL/LL	AL	LL	AL	LL
F_DA	1	0	1	19	60	26	43
F_UB	0	0	0	19	49	31	25
F_DB	0	0	0	9	62	40	36
F_UC	0	0	21	4	47	13	26
F_DC	0	0	0	7	43	21	26
F_Inland M	2	1	1	6	71	22	40
Sub-total	3	1	23	64	332	153	196
Project-related	**1**	**1**	**2**	**32**	**263**	**84**	**170**
Non Project-related	2	0	21	32	69	69	26

4.1.4 The action and limit levels exceedances of ammonia nitrogen (NH_3-N), nitrate nitrogen (NO_3-N), nitrite nitrogen (NO_2-N), total inorganic nitrogen (TIN), total phosphorus (TP) and chlorophyll a (Chl a) exceedances for marine and fresh water monitoring stations are summarized in **Tables 4.3 and 4.4**.

Table 4.3 Summary of Action and Limit Level Exceedance (Marine Water - Nutrient)

Monitoring Station	No. of Exceedances of Action Level (AL) and Limit Level (LL)										
	NH_3-N		NO_3-N		NO_2-N		TIN		TP	Chl a	
Total no. of water sample taken during construction phase = 278											
	AL	LL	AL	LL	AL	LL	AL	LL	LL	AL	LL
M_Marsh	0	17	0	4	1	0	5	1	0	6	2
TTC	9	33	1	3	0	0	3	3	0	6	29
M_BP	0	11	0	1	0	0	1	0	0	6	0
M_Coral	0	2	0	1	0	0	0	0	0	2	0
KS	3	6	3	0	0	0	0	2	0	3	10
Sub-total	12	69	4	9	1	0	9	6	0	23	41
Project-related	**0**	**0**	**0**	**2**	**0**	**0**	**1**	**1**	**0**	**0**	**0**
Non Project-related	12	69	4	7	1	0	8	5	0	23	41

Table 4.4 Summary of Action and Limit Level Exceedance (Fresh Water - Nutrient)

Monitoring Station	No. of Exceedances of Action Level (AL) and Limit Level (LL)								
	NH_3-N	NO_3-N		NO_2-N	TIN		TP	Chl a	
Total no. of water sample taken during construction phase = 193									
	LL	AL	LL	LL	AL	LL	LL	AL	LL
F_DA	5	4	8	1	2	8	1	4	6
F_UB	6	2	17	2	0	18	2	0	6
F_DB	8	2	23	2	2	22	2	1	9
F_UC	6	4	10	3	1	11	2	3	8
F_DC	4	2	16	0	1	16	2	1	7
F_Inland M	52	2	68	23	1	69	1	3	41
Sub-total	81	16	142	31	7	144	10	12	77
Project-related	**40**	**2**	**59**	**13**	**1**	**63**	**1**	**2**	**41**
Non Project-related	41	14	83	18	6	81	9	10	36

Ecology

4.1.5 Apart from the accidental vegetation clearance of part of the buffer zone at Streams B and C, all of the identified sensitive streams are protected. Stream C was heavily silted after the wet season 2007 and extremely low abundance of Caridian shrimps was recorded since June 2007. Fortunately, the ecological surveys were observed a few of them since November 2007.

4.1.6 Most of the corals were recovered at Site B2, Site C and Control Site after two-year monitoring. Mortality from natural causes (such as bleaching, wave action damages and sediments from wave actions) is common in coral communities. Losses of tagged corals were recorded which could be due to the strong wave actions during typhoon weather. Wave actions could able to disturb seabed sediment covering some coral colonies, which might case mortality on isolated colonies at Site B2.

4.1.7 89 corals were identified at the footprint of desalination plant pipelines and transplanted to the bedrock near Site D2 (south of the existing KSC pier). Among the 89 transplanted corals, 86 colonies were recovered after one year quarterly monitoring (corals Nos. 68, 71, and 81 were found missing). Some transplanted colonies were found with a certain degree of mortality, but no sedimentation or bleaching was found. Mortality is not considered project-related. The corals remained similar with the baseline conditions during the transplantation survey.

4.1 Review of Reasons for the Non-compliance and Action Taken

4.1.1 Revised construction programme was submitted by the Contractor in January and February 2006. ET commented on the revised programme which indicated that major earthwork would be carried out during the wet season. Large proportion of area (cut-and-fill) would be exposed during the wet season and the area was significantly more than recommended in the EIA report (around one third of exposed area during construction). It was vulnerable to heavy rain and very likely to induce nuisance (e.g. silty runoff) to the fisherman and nearby marine sensitive receivers. It was also susceptible to wind erosion and causing dust nuisance to air sensitive receiver. In addition, turf establishment was concentrated within short period of time which might cause potential nutrients and pesticides runoff when the closed low flow drainage system was not yet completed.

4.1.2 Referring to **Tables 3.1 and 3.2**, actual exposed earth area was increased from 30% to more than 60% during April to September 2006 (wet season). Most of the construction areas were exposed during October 2006 to March 2007 (dry season). According to site record, mitigation measures provided on site were insufficient to control the dust generation and silty runoff. The exceedances records on air and water quality revealed that the open up areas were too extensive leading to implemented mitigation measures could not effectively minimize the impacts to the environment.

Air Quality

Dust Nuisance

4.1.3 Once the air quality monitoring result exceeded the action / limit level, additional 24-hr TSP sample was taken in according to the EM&A manual (Event and Action Plan). ET had further discussed with HKJC, RE and IEC in order to minimize the dust nuisance to the environment and nearby golfers. ET recommended the Contractor to provide more frequent watering at all major haul roads and during the rock breaking activities. In addition, ET also recommended the Contractor to pave the major haul roads with hard surface.

4.1.4 According to the weekly site audit report and monitoring results, the dust suppression measures provided on site during rock breaking, earth moving activities and major haul roads were considered insufficient leading to dust nuisance. There were two known available water sources for dust suppression, (i) downstream of fresh water inland marsh and (ii) water supply from existing golf course during night time. HKJC allowed the Contractor to use water from both water sources. The Contractor started to pump the water directly at downstream of the fresh water inland marsh since September 2006 to April 2007 for watering at haul road. However, there was no formal record regarding the quantity of water usage from existing golf course during night time. In addition, the Contractor reported that water supply from WSD could also be used for dust suppression during site progress meeting but no usage record was received. HKJC repeatedly reminded the Contractor to explore all possible water sources to minimize the dust nuisance during site progress meetings.

4.1.5 In order to minimize dust nuisance to the nearby golfers, hoarding were installed at some critical part of the site boundary in March 2006. Wheel wash facility was provided at the main entrance/exit in January 2007 after one year of construction phase commencement.

Water Quality

Silty Runoff

4.1.6 Exceedances on water quality were mainly recorded at fresh water and marine monitoring stations during the two wet seasons in 2006 and 2007. EPD had issued a letter dated 28th April 2006 to the Contractor regarding the water quality preliminary results on 24th April 2006 indicating exceedance on water quality on both fresh water and marine bodies. EPD concluded that the previous implemented measures by the Contractor were not sufficient to prevent silty runoff. There was a need to review the effectiveness of existing measures and further mitigation measures in order to prevent similar incident from occurring in the future.

4.1.7 EPD also advised the Contractor to take all necessary actions to rectify the situation so as not to contravene the statutory requirements under the EIAO. In relation to the potential adverse water quality impact, the Contractor should pay particular attention to the latter part of EP Condition 3.2 of the Project.

4.1.8 HKJC, RE and ET had urged the Contractor to submit the Temporary Drainage Management Plan (TDMP) for RE approval and implement the temporary drainage on site before wet season 2006 in order to minimize silty runoff to nearby sensitive receivers. After the silty runoff incident occurred in April 2006, enhancement of silty runoff mitigation measures including desilting basins, silt fence and silt curtains were provided on site.

4.1.9 ET repeatedly reminded the Contractor during every routine site audit to strengthen the silt fence along the site boundary, in particular low lying areas, with proper maintenance, provide cut-off drain to divert the natural runoff in order to minimize the mixing of contaminated water within the construction site, open up the construction area (vegetation clearance) only when construction work require, operate the desilting facilities during rain before discharge and cover up the soil stockpiles by tarpaulin or hydroseeds. However, the implementation of the mitigation measures was considered insufficient and ineffective to minimize the silty runoff and exceedances were still recorded at fresh water and marine water throughout the wet seasons in 2006 and 2007.

Contractor's Temporary Sewage Treatment Plant

4.1.10 Long-term nutrient exceedances was recorded at the downstream of fresh water inland marsh since February 2007. As agreed with HKJC, a joint sampling with ET and the Contractor was carried out on 16th April 2006 and water sample was collected at the effluent discharge outlet of the temporary sewage treatment plant near to the Contractor's site office. High level of ammonia nitrogen was recorded at 287 mg/L (exceeds the required standard of the discharge licence, 20 mg/L). Sight exceedance of suspended solids was recorded at 32 mg/L (exceeds the required standard of the discharge licence, 30 mg/L). The nitrate nitrogen and nitrite nitrogen were undetectable which indicated that there was neither nitrification nor de-nitrification process of the plant. RE immediately requested the Contractor to stop the plant to avoid any hazard to the public and environment (directly discharge to fresh water inland marsh) until the plant can perform according to the EPD's discharge licence.

4.1.11 High concentrations of ammonia nitrogen (286 mg/L), biochemical oxygen demand (134 mg/L) and *E. coli* (9,600,000 cfu/100mL) were still recorded on 12th May 2007 and all concentrations exceeded the EPD's discharge licence requirement. ET and IEC recommended the Contractor

to dispose the contaminated water properly offsite by a licenced Contractor offsite until the sewage treatment plant was rectified. Temporary storage tank was installed on 5th May 2007 in order to prevent direct discharge of contaminated water to the fresh water inland marsh as the interim mitigation measure until the Contractor repair and resume the sewage treatment plant.

4.1.12 It is, therefore, confirmed that the cause of the nutrient exceedances at the downstream of fresh water inland marsh since February 2007 was due to the poor performance of the Contractor's temporary sewage treatment plant.

4.1.13 HKJC, ET and IEC requested the Contractor to provide evidence to proof the performance of the STP and comply with the discharge licence before directly discharge to fresh water inland marsh. However, no information was submitted by the Contractor until the removal of the sewage treatment plant in December 2007.

Terrestrial Ecology

Stream A: Fill up with Rubble

4.1.14 During the monitoring survey carried out in June 2006, the main stream course of Stream A (the section downstream to the confluence of tributaries A1 and A2) was found to be filled up by rubble to the level of the weir at its downstream end. The rubble was reported to be washed down from the upper Tributary A2 which was under pipe culvert construction. Although the riparian vegetation was not affected by the rubbles, this section of stream channel was temporarily lost. HKJC required the Contractor to carry out remedial works in order to clear out all of the rubble and restore the channel as the baseline condition of Stream A.

4.1.15 Stream A was reinstated by the Contractor (without heavy equipment entering buffer zone) in November 2006. However, rubble from Hole 17 was washed into the downstream A again after the reinstatement. Downstream A was reinstated in December 2006.

4.1.16 The third incident of rubble filling at downstream of Stream A was occurred on 3rd July 2007 after rain. Downstream A was reinstated in August 2007. However, there was still some rubble sitting on the stream bed of the downstream of Stream A in December 2007.

4.1.17 A join site visit with HKJC, RE, ET and Contractor was carried out in 5th February 2008 and agreed that some minor works needed to be done underneath to the bridge section. Most of the Stream A is reinstated.

Stream A: Buffer Zone Intrusion

4.1.18 Regarding the site inspection carried out by EPD with the Contractor Representative on 19th May 2006 and 5th June 2006, EPD noted that some encroachment of personnel and equipment was found in the buffer zones of Stream A. EPD would like to draw particular attention to EP condition 3.4. IEC carried out site investigation with ET on 15th June 2006. Observation revealed that rock filling materials were found at downstream of Stream A. A portion of the rock filling material was lying within the buffer zone of Stream A and access roads were built in early June 2006. It was evidence that there had been site activities carried out within the buffer zone area of Stream A in wet season (April to October).

4.1.19 IEC held a meeting immediately with HKJC, Contractor and ET after the site investigation. It was learn that the concrete paved access road was constructed in order to connect to the temporary bridge at Stream A. The purpose of the paved haul road was to minimize the silty runoff to Stream A. HKJC, RE, ET and IEC reminded the Contractor to strictly follow the EP condition and avoid same incident occurred in future.

Stream B: Buffer Zone Intrusion

4.1.20 An environmental site audit was carried out on 7th November 2006, a backhoe was observed and working (vegetation clearance) within the buffer zone of Stream B2. ET notified the RE and Contractor once the incidence happened, the work was stopped by the Contractor immediately. According to the site investigation on 10th November 2006, the area of the vegetation clearance area was about 45 m² (3 m x 15 m) within the buffer zone of Stream B2. ET recommended the Contractor to post up warning signage along all three buffer zones to clearly demonstrate entries to buffer zones are prohibited to avoid similar incident occurred again.

4.1.21 A meeting was arranged with the HKJC, ET, Contractor, RE and IEC on 14th November 2006. The incident report, mitigation measures and proposed remediation work were prepared by the Contractor and submitted to EPD in November 2006.

4.1.22 A letter was issued by EPD to HKJC on 12th December 2006 and advised the HKJC to pay particular attention to the EP condition 3.4 and take all necessary actions so as not to contravene the statutory requirements under the EIAO. When there is any require work to be carried out with in the buffer zone, a variation of EP may be required. ET requested the Contractor to prepare a detail mitigation work programme for comments and get approval from RE and HKJC before carrying out any mitigation work within the buffer zone on site.

4.1.23 ET has commented on the mitigation work proposal in mid-December 2006 and the Contractor submitted the revised proposal in March 2007. Reinstatement work at Stream B2 buffer zone was carried out in March 2007 by planting native shrub (including *Gordonia axillaries, Melastoma candidum, Melastoma sanguineum, Rhaphiolepis indica, Rhodomyrtus tomentosa*) with approximate 400 mm height at four plots per metre square density. The Contractor was reminded to keep the reinstated area in good and healthy condition for the established plants.

Stream C: Buffer Zone Intrusion

4.1.24 Buffer zone intrusion at Stream C near Hole 16 tee was recorded during the construction of the permanent drainage in May 2007. Incident report (intrusion due to construction of permanent drainage system) was prepared and submitted by the Contractor in June 2007. Stream C buffer zone was reinstated by planting native shrub in June 2007 which was similar to Stream B2. The Contractor was reminded to water frequently at the reinstated areas of Streams B and C. The Contractor was reminded to keep the reinstated area in good and healthy condition for the established plants.

Streams B & C: Low Abundance of Caridian Shrimp

4.1.25 Heavy silty runoff was recorded on 22nd November 2006 at all Streams in particular Stream C (suspended solids of impact monitoring stations of Stream A, B and C were 130 mg/L, 49 mg/L & 836 mg/L respectively) and fresh water inland marsh (Suspended solids was 393 mg/L). Streams B & C were accumulated by sediment throughout the wet season of 2007.

4.1.26 Very low abundances of aquatic fauna, in particular Caridian shrimps, were recorded since June 2007. However, few of them were observed at Streams B & C since November 2007.

Marine Ecology

Coral Damage at Temporary Barging Point during Construction

4.1.27 Coral surveys were conducted on 23rd and 25th March 2006 at Site B2, Site C and Control Site during the construction of the rock-filled pier (temporary barging point) at East side of Kau Sai Chau). The survey results revealed that some boulders and sand were found outside the seawall block and some tagged corals were damaged due to the construction work. Among the 20 tagged corals, 6 of them had more obvious damages, while another two tagged corals had minor damages. Site C and the Control Site still remained similar conditions as during the Baseline Survey. No mortality, sedimentation or bleaching was found on the tagged corals in these two sites.

4.1.28 ET has informed and submitted the coral damage assessment report, incident report and proposed remedial work plan to EPD, AFCD, HKJC, RE and IEC. Additional coral monitoring at temporary baring point in terms of numbers, frequency and proposed remediation work are also proposed by ET after the incident for EPD and AFCD comments. Extension of three monthly coral surveys was required and carried out by ET in April, May and June 2006 in addition to the EM&A requirement. More corals were required to be monitored at Site B2 (temporary barging point), from 20 numbers to 50 numbers, throughout the construction phase of this Project.

4.1.29 The Contractor submitted the ecological remedial plan for the temporary barging point in July 2006 to EPD and AFCD for comments. The repaired corals were required to monitor on quarterly basis for a year in addition to the coral repair, boulder removal, sedimentation removal and site management. The one-year repair coral survey, coral repair work and boulder removal work were completed and submitted to EPD and AFCD for record.

4.1.30 As suggested by AFCD, additional coral surveys at the temporary barging point was required to avoid similar incident from occurring again as an addition protection measure to protect the coral along the shore during the removal period.

4.1.31 ET had provided comments on the proposed removal work in December 2007 and submitted to EPD and AFCD for further comments. They are summarized as follows:

i. The flat barge will be berthed near to the pier for most of the time during the temporary barging point removal. We are concerned that the coral communities might be damaged during low-tide. ET suggested that the flat barge is not allowed to berth when low-tide. The Contractor should record and check the tide condition during whole period of removal.

ii. The flat barge should be properly enclosed along the three sides to prevent any object falling into the sea during loading of excavated material.

iii. ET recommended that silt curtain should also be provided during Stage 2 to prevent any silty water infiltrate through the seawall blocks to the nearby coral communities.

iv. ET concerned that the removal of all seawall blocks during Stage 3. Removal of all the seawall blocks at once would cause the unstable filling materials rolling/sliding by water current and lead to potential damage to the nearby coral communities. ET suggested that the Contractor to review the seawall blocks removal sequence and retain them until the final stage of the removal.

v. ET suggested that Contractor should install the silt curtain away from the nearby coral communities. The silt curtain installed location should be checked by coral specialist in order to prevent any damage to the nearby coral communities.

4.1.32 The proposed temporary barging point removal programme is around one month. AFCD agreed the proposed coral monitoring (during the first, third and fifth weeks) at the temporary barging point removal in order to cover the whole removal period. If there is an extension of the removal programme due to any coral damage, further review on the coral monitoring frequency is required and will be submitted for AFCD and EPD approval.

4.1.33 In addition to ET's comments, AFCD requires the Contractor to submit event action plan including appropriate mitigation measures and remedial actions in case coral damage occurred during the removal period before commencement of the removal works.

4.1.34 AFCD commented on the revised removal programme and event and action plan submitted by the Contractor on 1st February 2008, they are (i) the Contractor should provide coral specialist during the installation of the silt curtain in order to avoid any damage to the nearby coral communities and (ii) the Contractor should clarify the removal work will be carried out during adverse weather or not. The Contractor agreed that coral specialist will be provided during silt curtain installation and no removal work will be carried out at the temporary barging point during adverse weather.

4.1.35 The original removal programme submitted by the Contractor was on 16th January 2008. According to the revised programme, the removal programme of temporary barging point will be delayed to 12th February 2008.

4.1.36 As the post construction phase impact monitoring was completed by the end of January 2008. ET and IEC responsibilities and duties will also be terminated in January 2008. Therefore, the removal progress and coral monitoring survey findings will NOT be included in this final report. However, all related reports will be submitted to EPD and AFCD separately for comments under this Project.

5. Summary of Complaints / Summon Notifications

Air Quality

5.1.1 For the construction dust generated from the construction site to nearby sensitive receivers (public/golfers), EPD formally issued "Yellow Form" to the Contractor on 30th March 2006 after the site inspection on 10th March 2006. EPD carried out routine site inspections and gave verbal warnings to the Contractor on (i) dust generation from dusty stockpiles and vehicles at major haul roads and (ii) insufficient installation of hoarding at the main exit/entrance according to the Air Pollution Control Ordinance (APCO) after the site inspection. However, the progress of the dust suppression mitigation measures provided on site was slow. EPD did the site investigation on 15th January 2007 and issued "Pink Form" to the Contractor on 17th January 2007 (Reference no. L/M to EP/AC/11/5000/40032) under the APCO. The non-compliance is due to carrying out notifiable work not in accordance with the Schedule of the APCO (Construction Dust) Regulation (Schedule no.14).

5.1.2 One environmental complaint was received from golfers to HKJC on 6th September 2006 regarding the dust generation from the construction site. A follow up site investigation report and further mitigation measures were submitted to EPD for comments. According to the air quality monitoring results (24-hour TSP) for September to early October 2006 indicated significant increasing trend of dust generated from the construction site. The monitoring results correlated with the weekly site observation. The site inspection revealed that haul road (vehicle movement) and rock breaking activities were major dust emission sources. The Contractor was repeatedly reminded to provide sufficient dust suppression mitigation measure to minimize the dust impacts such as provide more water trucks, watering haul road more frequently and pave the haul roads. HKJC and RE also repeatedly urged and requested the Contractor to provide more dust suppression mitigation measures to reduce dust nuisance to the nearby golfers and staffs.

5.1.3 A second "Pink Form" was issued by EPD to the Contractor on 7th May 2007 (Reference no. L/M to EP/AC/11/5000/40032(2)) under the APCO. The non-compliance is due to carrying out notifiable work not in accordance with the Schedule of the APCO (Construction Dust) Regulation (Schedule no.14 and 22).

5.1.4 A second environmental complaint was received from golfers to the HKJC on September 2007 regarding the dust generation from the construction site at Hole 1 to the existing golf course. The Contractor was reminded to provide dust suppression mitigation measures to prevent dust generation due to wind erosion from the dusty stockpiles. Three times (3rd, 9th and 12th October 2007) site investigation were carried out by ET. Additional mitigation measures (eg. watering sand stockpile and operation of irrigation system) were observed and no mentioned problem was found. The Contractor was reminded to provide sufficient watering or other equivalent measures to minimize dust nuisance from haul roads, stockpiles and other activities that may generate dust. It was concluded that the Contractor did not provided sufficient mitigation measures to avoid causing dust nuisance from the works area.

Water Quality

5.1.5 A compliant letter was issued from the fish pond holder (Tiu Cham Wan) to the Contractor on 11th March 2006. One of their concerns was on the water quality that the construction activities may potentially pollute the water quality within their fish pond area. ET reminded the Contractor to modify the haul road to minimize the potential silty runoff and progress had been made by the Contractor in April 2006 (provision of paved haul road with site drainage). ET further recommended the Contractor to install sufficient temporary drainage before wet season. Weekly site audit and water quality monitoring was routinely carried out in January and February 2006. No non-compliance was recorded. In addition, on-site observation revealed that no evidence of fish culture activity in the mentioned area.

5.1.6 One environmental complaint was received in June 2006. Tai Tau Chau fish farmers expressed their concern about the silty runoff from the construction site and fish death issues to HKJC on 2nd June 2006 afternoon after the rainstorm event. Site investigation was carried out on 2nd June 2006 at Tai Tau Chau fish farm with ET, HKJC and the Contractor in the afternoon. Further site investigations on the water quality and cause of fish death were carried out by AFCD, EPD and loss adjustor (Contractor) between 2nd and 5th June 2006. Kai Lung Wai fish farmers also raised their concern on the fish death on 3rd June 2006. Further site investigations on the water quality and fish death were carried out by AFCD, HKJC and loss adjustor (Contractor) between 3rd and 5th June 2006. The investigation report on the cause of the fish death was confirmed that silty runoff from the construction site to Tai Tau Chau fish farms after heavy rainstorm events was one of the major reasons.

5.1.7 According to the EPD's record, the Contractor was convicted for breaching the Water Pollution Control Ordinance (WPCO) and fined $50,000 in November 2006. The main reason for the prosecution was due to the active pumping/discharge of silty water from the construction site of desalination plant directly into Port Shelter Water Control Zone (WCZ) without provision of proper water treatment facilities on site for treatment to ensure that the water quality complied within Water Quality Objectives (WQO) of Port Shelter before discharge on 12th June 2006.

6. Validity of EIA prediction, Shortcomings in EIA and Comments

6.1.1 The EIA report develops validity predictions/recommendations on different aspects including air quality, water quality, ecology, landscape and visual, archaeology and land contamination during the construction and operation phases of this Project. The implementation schedule is shown in **Annex D** and used as useful tools to monitor the construction site during site audit. However, some shortcomings in EIA recommendations were identified. A review of the effectiveness and efficiency of the mitigation measures and performance of the environmental management system (overall EM&A programme) are summarized in **Table 6.1**.

Table 6.1 Overall Performances of Mitigation Measures and EM&A Performance

EIA predictions / shortcomings / recommendations	Review of effectiveness and efficiency of mitigation measures	Performance of EM&A programme
Air Quality Appropriate dust control measures should be implemented during construction stage in accordance with the requirements in the *Air Pollution Control (Construction Dust) Regulation*. Dust control techniques should be considered to control dust to a level not exceeding the AQOs as well as the 1-hour TSP guideline level. These measures include: • Adoption of good site practices; • Avoid practices likely to raise dust level; • Frequent cleaning and damping down of stockpiles, dusty areas of the Site and the haul roads; • Reduce the speed of the vehicles (say 10 kph) on the haul road; • Reducing drop height during material handling; • Provision of wheel-washing facilities for Site vehicles leaving the Site; • Regular plant maintenance to minimize exhaust emission; • Sweep up dust and debris at the end of each shift; and • If concrete batching plant or rock crushing plant is planned to be used, a license from EPD may be required depending on the total silo capacity since they are specified processes under the APCO. Modern plant should be designed to limit emissions. EIA report assumes that all mitigation measures will be implemented on site before any impact arises. With the	According to the site observations and records throughout the construction phase, major dust suppression measures provided on site were watering and paving at the major haul roads. Due to the extensive exposure of bare earth during construction phase without provision of sufficient dust suppression measures, dust generation from dusty stockpiles, high traffic haul roads, earth moving activities and rock breaking activities were frequently observed. The Contractor did not implement effective dust suppression measures at early stage of the construction phase. The insufficient and ineffectively implemented mitigation measures which causing dust nuisance to the environment and nearby golfers. The dust impact from the construction site was confirmed by the air quality monitoring data and site audit records. Some dust suppression mitigation measures were provided even at very late stage of construction phase (hoarding, wheel wash facilities etc).	EM&A programme provide comprehensive air quality data (24-hr TSP) during the construction phase to evaluate the actual site condition. Exceedances were recorded during the construction phase. Once exceedance is found, event and action plan will be followed in order to notify all relevant parties, minimize the impacts, rectify the situation and avoid the incident occurred in future again. Due to the insufficient dust suppression measures provided on site, dust generation was still frequently observed to the environment and nearby golfers.

EIA predictions / shortcomings / recommendations	Review of effectiveness and efficiency of mitigation measures	Performance of EM&A programme
implementation of all recommended mitigation measures, it should be sufficient to maintain the air quality within acceptable impact level.		
Water Quality Key mitigation measures recommended during the construction phase are shown as follows: • Proposed 18-hole Golf Course Layout Design – buffer zone at streams; • Run-off and Drainage Management – silty and turf establishment run-off; • Concrete bridge construction; • Dredging during construction of desalination plant's intake and outfall; • General construction activities; • On-Site Sewage Effluents; and • Concrete batching plant. Key mitigation measures recommended during the operation phase are shown as follows: • Chemicals and Pesticides Run-off (closed low flow drainage system); and • Hole 5 and part of Hole 6 – Filter system and biopesticides. With the implementation of all recommended mitigation measures, it should be sufficient to maintain the water quality within acceptable impact level. EIA report assumes that all mitigation measures will be implemented on site before any impact arises. However, the Contractor did not implement at early stage.	It is stated clearly in EIA report that it is very critical to manage the stormwater run-off during the construction phase. In according to the EIA report, the golf holes are constructed sequentially into three groups (southernmost - Holes 11 to 16, northernmost - Holes 3 to 9 and central - Holes 1 to 2, 10, 17 to 18). Maximum two holes are recommended to be worked simultaneously for each group for cut-and-fill works. However, earthworks were conducted throughout the wet seasons of 2006 and 2007 due to the limitation of tight construction programme. More than 60% area was exposed without provision of sufficient silty runoff mitigation measures leading to silty runoff. In addition to the construction programme as one of management control to the silty runoff, proposed erosion control measures in the EIA report which will be accomplished through one or more several means, including (but not limit to): sedimentation tanks, silt fences, sand bags, porous pipe, hydroseeding; erosion control fabrics and mats; and temporary sedimentation basins. As recommended in the EIA report, a temporary drainage system have to fulfill the following purposes: (i) minimize the stormwater flow entering the works areas during construction; (ii) prevention of any polluted run-off to existing streams and marine waters; and (iii) recycle, reuse and recirculation of run-off for irrigation use. The Contractor implemented some recommended mitigation measures to prevent silty runoff but silty runoff was still observed and recorded	EM&A programme provide comprehensive water quality data during the construction phase to evaluate the actual condition at streams and marine water. Exceedances were recorded during the construction phase. Once exceedance is found, event and action plan will be followed in order to notify all relevant parties, minimize the impacts, rectify the situation and avoid the incident occurred in future again. Due to the slow progress of rectification work and improvement on the implemented temporary drainage system, silty runoff was still frequently recorded, in particular wet season.

EIA predictions / shortcomings / recommendations	Review of effectiveness and efficiency of mitigation measures	Performance of EM&A programme
	frequently at streams and marine water in particular wet season. Water quality monitoring data and site observation revealed that the implemented mitigation measures were ineffective and insufficient leading to silty runoff. Rectification and enhancement works at the vulnerable low lying areas was considered slow also leading to frequent silty runoff from construction site.	
Terrestrial Ecology Impacts to streams had been avoided during the design stage by designating buffer zones at all identified sensitive streams. Except at the crossings, there will be no direct disturbance to the stream bed. With the implementation of all recommended mitigation measures, all streams should remain intact during construction and operation phase.	There are several incidents occurred during the construction phase leading to different extend of stream disturbance. The Contractor has installed plastic orange fencing along the buffer zone at each stream when works approach. However, the site agent/worker did not acknowledge the importance of buffer zone and requirement in the EIA and EP which are prohibited and protected leading to stream disturbance incidents occurred. Provision of 20m buffer zone is an effectively mitigation measures to avoid disturbance to stream but the Contractor should also provide sufficient training and resources to their environmental and engineering teams in order to avoid the intrusion incident. Silty runoff to the Stream C leading to absent of the Caridina shrimp in June 2007 but were found but still in very low density since November 2007. The major cause was due to insufficient temporary drainage and cut off drains provided near to Stream C (Golf Hole 16).	EM&A programme provide comprehensive terrestrial ecology survey results during the construction phase to evaluate the actual condition at all protected streams and buffer zone. Exceedances were recorded during the construction phase. Once exceedance is found, event and action plan will be followed in order to notify all relevant parties, minimize the impacts, rectify the situation and avoid the incident occurred in future again. Repeated non-compliance records were due to the intrusion to the buffer zone and insufficient temporary drainage provided on site.
Marine Ecology Coral colonies within confined silt curtain area at Site D2 (79 colonies identified during the coral mapping survey) would be transplanted to the bedrock area about 80 m south of the existing KSC ferry pier during the EIA stage.	No dredging work for the desalination plant pipelines were carried out during the construction phase. The pipelines were constructed along the existing KSC pier (inland) in order to prevent the seabed disturbance and potential water quality impacts to the	EM&A programme provide comprehensive marine ecology survey results during the construction phase to evaluate the actual condition of coral communities and seagrass.

EIA predictions / shortcomings / recommendations	Review of effectiveness and efficiency of mitigation measures	Performance of EM&A programme
Dredging for the two pipelines (intake and discharge) for the desalination plant would require 50 days and would be scheduled to the extent possible from January to April 2006. This would avoid the flowering season for the seagrass *Halophila ovalis*, i.e. November and December (Fong *et al*. 2005) and the spawning season for corals, i.e. July to October (Lam 2000; Storlazzi, C. D. 2004). All anchoring points/structures of the floating pier would be located on the shore and/or at least 40m seaward to avoid the coral colonies at Site B2. The location of the floating pier would be shifted from the original location for barging point at Zone 2 and Zone 3 of the mapping area in Site B2 to Zone 5 which had the least corals (as specify in the EP).	environment. 89 coral colonies were identified and transplanted to the area about 80m away south of the existing KSC ferry pier before the commencement of testing and commissioning for the desalination plant. A rock-filled pier of the temporary barging point was constructed at Site B2. Coral damages were found during construction in March 2006. Frequent coral monitoring and more tagged corals at Site B2 were requested by AFCD in order to prevent further damage to the coral communities. AFCD also reminded the Contractor to pay attention during the operation and removal of the temporary barging point. The major cause for coral damage incident was due to the Contractor did not provide coral specialist / diver to identify the nearby coral communities during the design phase and construction of the temporary barging point.	Exceedances were recorded during the construction phase. Once exceedance is found, event and action plan will be followed in order to notify all relevant parties, minimize the impacts, rectify the situation and avoid the incident occurred in future again. The monitoring results revealed that no further coral damage was recorded after the coral damage incident occurred in March 2006.
<u>Landscape & Visual</u> In order to mitigate landscape and visual impacts, mitigation measures will be implemented. These can be categorised in the following groups: • Construction areas; • Tree planting; • Shrub and groundcover planting; • Engineering infrastructure: bridges, desalination plant, pumping stations and water tanks; and • Buildings: extensions of existing, halfway houses and rain shelters. To compensate loss of trees, a total of 42 trees will be transplanted and 967 trees (more than 3:1 ratio) will be planted on the new golf course (Appendix A12.1).	Major deficiencies on the implemented mitigation measures are shown as follows: Construction Areas - Vegetation: (i) "*Temporary construction sites shall be restored to standards as good as, or better than, the original condition. In this respect, areas that are not covered by golf course grassing works shall be hydro seeded*". The site audit revealed that the quality of the hydroseedings was poor and insufficient water was provided. (ii) "*The potential for soil erosion shall be reduced at the construction stage by minimizing the extent of vegetation disturbance on site and providing a protective cover over exposed ground*". The site audit revealed that hydroseedings were provided near to the completion of	EM&A programme provide comprehensive landscape and visual site audit during the construction phase to evaluate the actual condition of newly plants, transplanted trees, retained trees, constructed buildings and temporary structures conditions. Repeated non-compliance records were found during the construction phase. No rectification work had been carried out until the work completion. The following issues are still outstanding since June 2006: (i) Carry out surgery to damaged trees, (ii) Report the cause of death of tree T925, (iii) Re-fix the label of retained tree for easy identification, (iv) More frequent watering

EIA predictions / shortcomings / recommendations	Review of effectiveness and efficiency of mitigation measures	Performance of EM&A programme
	construction stage. (iii) "*No plant or building materials shall be stored under the dripline of retained trees and no vehicle movement or other construction activities like washing, concrete mixing etc shall be carried out under the dripline of trees*". The site audit revealed that the Contractor did not rectify the situation and causing death and damage to the retain trees until completion of the adminstration building extension. Tree Preservation, Planting and Buffer Areas – Tree Preservation: (i) "*Transplant preparation works shall be carried as soon as possible after commencement of construction. Rootball and crown pruning shall be carried out over at least 1 month*". The site audit revealed that transplantation preparation work is considered inappropriate.	for transplanted trees, planted vegetation and hydroseeded grass, (v) Rectify the mal-pruning practice of the transplanted trees; and (vi) Replace all trees and shrubs with poor quality.
<u>Archaeology</u> *Watching Brief* The project proponent should allow a flexibility to undertake the contingency arrangements. Should significant archaeological materials be discovered, appropriate mitigation measures will be designed and implemented by the project proponent. *Built Heritage* The following measures will be necessary to mitigate the adverse impacts arising from the proposed works during the construction phase; • A three metre fenced off buffer zone will be maintained around Grave #1 during the construction phase; • Graves #5 and #20 will be preserved by record. This will include a cartographic,	Watching Brief is carried out by ET which requires active communication with the Contractor regarding on the actual cut-and-fill progress at all concerned areas. All progress reports and final report were submitted to AMO and no further comment was received. No archaeological material was identified throughout the whole process. Grave #1 located at Hole 12 fairway was preserved and protected on site with three metre buffer zone. Grave #20 located at Hole 2 fairway was preserved by record. Cartographic, photographic and written record was submitted to AMO for approval. Grave #5 located at Hole 12 Tee was preserved on site instead of preserved	EM&A programme provide comprehensive watching brief programme during the construction. No non-compliance was recorded.

EIA predictions / shortcomings / recommendations	Review of effectiveness and efficiency of mitigation measures	Performance of EM&A programme
photographic and written record as well as a measured drawing to be undertaken prior to the commencement of site formation works. As well if AMO requires the retention of any historical structural elements associated with the grave, i.e. the plaque. The contractor will ensure the safe removal and transport of the material off the site; and • For the northern coastal section of the Kap Lo Kok Study Area, it is recommended that if during the course of construction works, a grave is found that the AMO is contacted immediately and that works stop in the immediate vicinity of the grave until it can be inspected by AMO staff.	by record after revise golf course design.	
<u>Land contamination</u> Based on the preliminary site investigation results, the site area contains hotspots of contamination of lead and sulphur. The contamination levels of these hotspots should be further assessed during the construction stage with a proper implementation of the CAR and RAP. In addition, since the exact cut areas on site during construction by the Contractor have not been determined at this stage, the Contractor should implement the suitable precautions and preventive measures for the discovery of buried or abandoned ordnance during the construction. Moreover, it is recommended that standard good practice should be implemented during the construction phase in order to minimize any potential exposure to contaminated soils or groundwater.	CAP, CAR and RAP were submitted to EPD for approval before carrying out any on-site remedial work. Based on the further assessment, only Hotspots L3 (Hole 18) was found contaminated by lead. The contaminated soil was quantified and transferred from Hole 18 (cut area) to Hole 17 (fill area). The full scale remediation work was carried on 4th October 2006. A Final Site Remediation Report (FSRR) was submitted to EPD for approval. No further comment was received.	EM&A programme provide comprehensive assessment to identify the contaminated hotspots and provide effective method to remediate the contaminated soil during the construction. No non-compliance was recorded.

7. Recommendations and Conclusions

7.1.1 Apart from exceedances to the Action and Limit Levels on air quality and water quality, non-compliance on coral damage at temporary barging point and non-compliance on buffer zone intrusion and vegetation clearance, the environmental monitoring data collected during the construction period were generally in line with the prediction of the EIA Report.

7.1.2 Provision of buffer zone and pre-cast bridge construction are good successful examples to minimize the impact on sensitive stream. Works to be carried out in dry season within buffer zone as stated in EP can further minimize the potential impact. Long-term water quality exceedances were found, in particular wet season, which was mainly due to the failure and insufficient of the temporary drainage implemented on site. It is important to note that a comprehensive, frequently update/review, highly maintain and effective temporary drainage system is the best management and practical tool to control silty runoff. Careful planning on bulky earthworks works programme is also the key success to control the silty runoff from construction site.

7.1.3 Kau Sai Chau is a relative remote Island, resources supply for environmental protection (such as desilting treatment plant, silt curtain, silt fences, tarpaulin etc) should be planned, implemented and properly stored on site during the construction phase. It is recommended that the Contactor should prepare and submit a comprehensive and site-specific environmental management plan to the client, RE and ET for comments before commencement of major earthwork for approval. This is an effective way to foresee the environmental problems and sort them out as soon as possible.

7.1.4 Temporary adverse impacts on air quality, water quality, terrestrial ecology and marine ecology were found after revealing two-year construction phase EM&A monitoring. It is also important to learn that the Contractor should follow all EIA recommendations, implemented mitigation measures before any work approach to environmental sensitive areas and modify/enhance mitigation measures due to the site constrain and conditions, if necessary in order to minimize and avoid any adverse impact to the environment.

7.1.5 According to the site inspection and site audit records, the Contractor was generally in compliance with environmental requirements except incidents causing buffer zone disturbance and coral damage at temporary barging point. However, the effectiveness and practicality of the mitigation measures provided by the Contractor were considered insufficient during the construction phase.

7.1.6 The original tentative construction programme for this Project was 18 months. Actual major golf course construction was completed in 24 months. Construction phase EM&A monitoring was terminated in December 2007. Post construction monitoring was completed in January 2008.

Annex A
Summary of EM&A Requirement

Summary of Impact EM&A Requirements

Impacts	Parameters/descriptions	Locations	Frequencies	Duration
Air Quality	24-Hour TSP	1 Location	Once every 6 days	During Construction
	1-Hour TSP	1 Location	Three times in every 6 days	During Construction (As required when complaint received)
Water Quality	Dissolved Oxygen, Temperature, Turbidity, pH, Salinity and SS	9 marine and 7 freshwater locations	**First 3 months** 3 times a week, mid-ebb and mid-flood tides. If there is no exceedance occurs for the first 3 months, reduce to once per week.	During Construction
	Dissolved Oxygen, Temperature, Turbidity, pH, Salinity, SS, NO3-N, NO2-N, NH3-N, TP and selected pesticides.	9 marine and 7 freshwater locations	Once per week. If there is no exceedance occurs, monitoring frequency is subjected to change and shall be agreed with EPD.	During Construction: turf establishment period (permanent low flow drainage is not completed)
	Dissolved Oxygen, Temperature, Turbidity, pH, Salinity, SS, NO3-N, NO2-N, NH3-N, TP, Chl-a and selected pesticides.	9 marine and 6 freshwater locations	A 2-year of monitoring period for the operation phase is proposed. Monitoring should be carried out on bi-weekly basis for the first 12 months, after when the frequency will be reviewed by EPD.	During Operation
	Dissolved Oxygen, Temperature, Turbidity, pH, Salinity, SS, NO3-N, NO2-N, NH3-N, TP, Chl-a and selected pesticides	8 marine locations	Additional water quality monitoring shall be carried out after heavy rain storm or when there is an overflow event from the reservoir, irrigation buffer lake or detention ponds/tanks.	During Construction and Operation
Terrestrial Ecology	Monitoring aquatic fauna	Streams A, B, C & D	Once a month	During Construction
	Environmental Site Inspection mainly on intact of buffer zones	Streams A, B and C	Once a week	During Construction

Impacts	Parameters/descriptions	Locations	Frequencies	Duration
Marine Ecology	Transplanted corals Natural corals	Site D2	Quarterly for one year after transplantation	During construction
		Site C, Site B2, Site D2, and the Control Site.	**For Site D2 and the Control Site:** Weekly at the first two weeks of dredging works for the desalination plant pipelines. If no exceedance was recorded, the monitoring schedule would be changed to biweekly till the pipeline construction works are finished. **For Site C, B2 and the Control Site:** Monthly for the first three months of the construction phase. If no exceedance was recorded, the monitoring schedule would be changed to quarterly during the rest of the construction phase.	During Construction
		Site C, Site D2 and the Control Site.	First three months would be monthly conducted during the first two years of the operation phase. If no exceedance was recorded, the monitoring schedule would be changed to semi-annually, i.e. once in dry season and once in wet season.	During Operation
	Seagrass bed	Site D3, and at Site D2 if seagrasses were found during the baseline monitoring.	Weekly during the first two weeks of dredging works, and then biweekly till the pipeline construction works are finished.	During Construction
		Site D3, and at Site D2 if seagrasses were found during the baseline monitoring.	During the first two years of the operation phase. The monitoring schedule during the first three months would be monthly. After that, the monitoring schedule would be changed to semi-annually, i.e. once in dry season and once in wet season.	During Operation
Landscape and Visual	Audits to ensure effective implementation of mitigation measures	Project area and at visual sensitive receivers	Auditing inspections and reporting shall be undertaken once every two weeks of the construction phase and once every two months of the operation phase.	During Construction and Operation
Archaeology (Watching Brief)	Monitor archaeological potential sites at major cut areas	Hole 2, Hole 11, Hole 12, Hole 14, Hole 15 and Hole 16.	The archaeologist should keep the AMO informed of the progress of watching brief. The archaeologist should submit progress reports every 3 months during the programme of the watching brief.	During Construction
Land Contamination	Total Sulphur and Total Lead	Locations 2, 3, 6, 7 & 8	One month before commencement of work at the identified 5 hotspots	During Construction
General Site Conditions	Environmental Site Inspection	Works areas and areas affected by works	Periodically (weekly basis)	During Construction

Annex B
Environmental Quality Performance Limits

Air Quality

Action and Limit Levels for 1-hour TSP

Location	Description	Action Level	Limit Level
GCA B1	**Bungalow A** adjacent to Kau Sai Chau Public Golf Course Administration Building	277.2 μg m^{-3}	500 μg m^{-3}

Note: The action levels for GCA B1 are developed based on baseline monitoring result.

Action and Limit Levels for 24-hour TSP

Location		Action Level	Limit Level
GCA B1	**Bungalow A** adjacent to Kau Sai Chau Public Golf Course Administration Building	187.4 μg m^{-3}	260 μg m^{-3}

Note: The action levels for GCA B1 are developed based on baseline monitoring result.

Water Quality

Derived Summaries of Action and Limit Levels for Marine Water Quality

Parameters	Location	Action	Location	Limit
DO (Surface & Middle)	FCZ	6.0 mg/L	FCZ	5.3 mg/L
	All except FCZ	4.9 mg/L	All except FCZ	4.6 mg/L
DO (Bottom)	All	3.7 mg/L	All	3.4 mg/L
pH (depth-averaged)		N/A	All	6.5 - 8.5
SS (Depth-averaged)☆	FCZ	4.5 mg/L	FCZ	5.6 mg/L
	All except FCZ	6.1 mg/L	All except FCZ	10.6 mg/L
SS (Depth-averaged) Dredging for submarine pipelines⊕	M_RO1	6.1 mg/L	M_RO1	10.6 mg/L
Turbidity (Tby) (depth-averaged) ☆	FCZ	2.9 NTU☼	FCZ	3.9 NTU☼
	All except FCZ	3.3 NTU☼	All except FCZ	6.2 NTU☼
Ammonia Nitrogen (depth-averaged)	FCZ	0.02 mg/L	FCZ	0.03 mg/L
	All except FCZ	0.05 mg/L Δ	All except FCZ	0.05 mg/L Δ
Nitrate Nitrogen (depth-averaged)	FCZ	0.08 mg/L	FCZ	0.09 mg/L
	All except FCZ	0.09mg/L Δ	All except FCZ	0.09 mg/L Δ
Nitrite Nitrogen (depth-averaged)	FCZ	0.02 mg/L θ	FCZ	0.02 mg/L θ
	All except FCZ	0.02 mg/L	All except FCZ	0.04 mg/L
TIN (depth-averaged)	FCZ	0.12 mg/L	FCZ	0.14 mg/L
	All except FCZ	0.16 mg/L	All except FCZ	0.18 mg/L
Total Phosphorus (depth-averaged)	All	0.09 mg/L Δ	All	0.09 mg/L Δ

Remarks:
☆ : Action and limit levels are subjected to review especially for wet season throughout the construction phase of the project.
⊕ : Action and limit levels are subjected to review before the dredging works.
☼ : All are based on EM&A baseline monitoring data due to marked difference between EPD turbidity data and those from the baseline survey.
Δ : For nutrient monitoring (except NO_2-N) at non-FCZ stations, the trigger level has made reference to the existing golf course guideline values. The guideline value of NO_2-N is below the current detection limit of 0.01mg/L and thus not used.
θ : The same action and limit level of 0.02 mg/L is determined from the EM&A baseline data as 78% of the NO_2-N data are <= 0.01 mg/L and all remaining 22% equal to 0.02 mg/L.
FCZ including fish culture zones of Kai Lung Wan, Tai Tau Chau and Kau Sai
All except FCZ including remaining impact monitoring station of M_RO1, M_Marsh, M_BP and M_Coral.
Control monitoring locations: M_A & M_B

Derived Summaries of Action and Limit Levels for Freshwater Water Quality

Parameters	Location	Action	Location	Limit
DO (mid-depth)		6.3 mg/L	All	4 mg/L ξ
pH (mid-depth)		N/A	All	6.0 - 9.0
SS (mid-depth) ☆	All	3.8 mg/L or 120% of upstream control station's SS at the same tide of the same day	All	8 mg/L or 130% of upstream control station's SS at the same tide of the same day
Turbidity (Tby) (mid-depth) ☆	All	3.1 NTU or 120% of upstream control station's Tby at the same tide of the same day	All	4 NTU or 130% of upstream control station's Tby at the same tide of the same day
Ammonia Nitrogen (mid-depth)		N/A	All	0.01 mg/L
Nitrate Nitrogen (mid-depth)	All	0.10 mg/L	All	0.11 mg/L
Nitrite Nitrogen (mid-depth)		N/A	All	0.01 mg/L
TIN (mid-depth)	All	0.12 mg/L	All	0.13 mg/L
Total Phosphorus (mid-depth)		N/A	All	0.02 mg/L

Remarks:
☆ : Action and limit levels are subjected to review especially for wet season.
Freshwater monitoring locations: F_UA, F_DA, F_UB, F_DB, F_UC, F_DC and F_Inland Marsh
As most of the freshwater samples were reported of NH_3-N, NO_2-N levels below the detection limit of 0.01 mg/L, limit level is set at 0.01 mg/L. Similarly for TP, a limit level of 0.02 mg/L (the detection limit of TP) is imposed.
ξ : Water Quality Objectives of the Port Shelter

Annex C
Event Action Plan

Event / Action Plan for Air Quality

EVENT	ACTION			
	ET	IC(E)	Engineer	CONTRACTOR
ACTION LEVEL				
1. Exceedance for one sample	1. Identify source, investigate the causes of complaint and propose remedial measures; 2. Inform IC(E) and Engineer; 3. Repeat measurement to confirm finding; 4. Increase to daily monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method.	1. Notify Contractor.	1. Rectify any unacceptable practice; 2. Amend working methods if appropriate.
2. Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IC(E) and Engineer; 3. Advise Engineer on effectiveness of proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase to daily monitoring; 6. Discuss with IC(E) and Contractor remedial actions required; 7. If exceedance continues, arrange meeting with IC(E) and Engineer; 8. If exceedance stops, cease additional monitoring.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor possible remedial measures; 4. Advise ET on the effectiveness of proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm in writing receipt of notification of exceedance; 2. Notify Contractor; 3. Supervise proper implementation of remedial measures.	1. Submit proposals for remedial measures to Engineer within three working days of notification; 2. Implement agreed proposals; 3. Amend proposal if appropriate.
LIMIT LEVEL				
1. Exceedance for one sample	1. Identify source, investigate causes of exceedance and propose remedial measures; 2. Inform IC(E), Engineer, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase to daily monitoring; 5. Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and Engineer	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor possible remedial measures; 4. Advise Engineer on effectiveness of proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm in writing receipt of notification of exceedance; 2. Notify Contractor; 3. Supervise proper implementation of remedial measures.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IC(E) within three working days of notification; 3. Implement the agreed proposals; 4. Amend proposals if appropriate.

EVENT	ACTION			
	ET	IC(E)	Engineer	CONTRACTOR
	informed of results.			
2 Exceedance for two or more consecutive samples	1. Notify IC(E), Engineer, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase to daily monitoring; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation measures to be implemented; 6. Arrange meeting with IC(E) and Engineer to discuss remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IC(E), EPD and Engineer informed of results; 8. If exceedance stops, cease additional monitoring.	Discuss amongst Engineer, ET, and Contractor the potential remedial actions; Review Contractor's remedial actions whenever necessary to assure their effectiveness, and advise Engineer accordingly; Supervise implementation of remedial measures.	Confirm receipt of notification of exceedance in writing; Notify Contractor; In consultation with the IC(E), agree with the Contractor the remedial measures to be implemented; Supervise proper implementation of remedial measures; If exceedance continues, consider what portion of the works is responsible and instruct the Contractor to stop that portion of work until exceedance has abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IC(E) within three working days of notification; 3. Implement the agreed proposals; 4. Resubmit proposals if problem still not under control; 5. Stop the relevant portion of works as instructed by Engineer until the exceedance is abated.

Event and Action Plan for Water Quality

Event	ET Leader	IC(E)	Engineer	Contractor
ACTION LEVEL				
Action level being exceeded by one sampling day	Repeat *in situ* measurement to confirm findings; Identify reasons for non-compliance and source(s) of impact; Inform IC(E) and Contractor; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IC(E) and Contractor; Repeat measurement on next day of exceedance.	Discuss mitigation measures with ET and Contractor ; Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly; Assess effectiveness of implemented mitigation measures.	Discuss proposed mitigation measures with IC(E); Make agreement on mitigation measures to be implemented. Assess effectiveness of the implemented mitigation measures.	Inform the Engineer and confirm in writing notification of the non-compliance; Rectify unacceptable practice; Check all plant and equipment; Consider changes in working methods; Discuss with ET and IC(E) and propose mitigation measures to IC(E) and Engineer; Implement agreed mitigation measures.
Action level being exceeded by more than two consecutive sampling days	Repeat *in situ* measurement to confirm findings; Identify reasons for non-compliance and source(s) of impact; Inform IC(E) and Contractor; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IC(E) and Contractor; Ensure mitigation measures are implemented; Prepare to increase to daily monitoring; Repeat measurement on next day of exceedance.	Discuss mitigation measures with ET and Contractor ; Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly; Assess effectiveness of implemented mitigation measures.	Discuss the proposed mitigation measures with IC(E); Make agreement on mitigation measures to be implemented; Assess effectiveness of implemented mitigation measures.	Inform Engineer and confirm in writing notification of the non-compliance; Rectify unacceptable practice; Check all plant and equipment; Consider changes in working methods; Discuss with ET and IC(E) and propose mitigation measures to IC(E) and Engineer within three working days; Implement agreed mitigation measures.
LIMIT LEVEL				
Limit level being exceeded by one sampling day	Repeat *in situ* measurement to confirm findings; Identify reasons for non-compliance and source(s) of impact; Inform IC(E) Contractor and EPD; Check monitoring data, all plant, equipment and Contractor's	Discuss mitigation measures with ET and Contractor; Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly; Assess effectiveness of implemented mitigation measures.	Discuss proposed mitigation measures with IC(E), ET and Contractor; Request Contractor to critically review the working methods; Make agreement on mitigation measures to be implemented; Assess effectiveness of implemented	Inform Engineer and confirm in writing notification of the non-compliance; Rectify unacceptable practice; Check all plant and equipment; Consider changes in working methods; Discuss with ET, IC(E)

Event	ET Leader	IC(E)	Engineer	Contractor
	working methods; Discuss mitigation measures with IC(E), Engineer and Contractor; Ensure mitigation measures are implemented; Increase to daily monitoring until no exceedance of Limit level.		mitigation measures.	and Engineer and propose mitigation measures to IC(E) and Engineer within three working days; Implement agreed mitigation measures.
Limit level being exceeded by more than two consecutive sampling days	Repeat *in situ* measurement to confirm findings; Identify reasons for non-compliance and source(s) of impact; Inform IC(E), Contractor and EPD; Check monitoring data, all plant, equipment and Contractor's working methods; Discuss mitigation measures with IC(E), Engineer and Contractor; Ensure mitigation measures are implemented; Increase to daily monitoring until no exceedance of Limit level for two consecutive days.	Discuss mitigation measures with ET and Contractor; Review proposals on mitigation measures submitted by Contractor and advise Engineer accordingly; Assess effectiveness of implemented mitigation measures.	Discuss proposed mitigation measures with IC(E), ET and Contractor; Request Contractor to critically review working methods; Make agreement on mitigation measures to be implemented; Assess effectiveness of implemented mitigation measures; Consider and if necessary instruct Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit level.	Inform Engineer and confirm in writing notification of the non-compliance; Rectify unacceptable practice; Check all plant and equipment; Consider changes of working methods; Discuss with ET, IC(E) and Engineer and propose mitigation measures to IC(E) and Engineer within three working days; Implement agreed mitigation measures; As directed by the Engineer, slow down or stop all or part of the construction activities until no exceedance of Limit level.

Action and Limit level and Event Action Plan for natural corals monitoring

Parameters	Action Level	Limit Level
Sedimentation	a 15% increase in the percentage of sedimentation on the hard corals occurs at more than 20% of the tagged coral colonies at one or more monitoring sites	a 25% increase in the percentage of sedimentation on the hard corals occurs at more than 20% of the tagged coral colonies at one or more monitoring sites
Bleaching	a 15% increase in the percentage of bleaching of hard corals occurs at more than 20% of the tagged coral colonies at one or more monitoring sites	a 25% increase in the percentage of bleaching of hard corals occurs at more than 20% of the tagged coral colonies at one or more monitoring sites
Mortality	a 15% increase in the percentage of partial mortality of corals occurs at more than 20% of the tagged coral colonies at one or more monitoring sites	a 25% increase in the percentage of partial mortality of corals occurs at more than 20% of the tagged coral colonies at one or more monitoring sites

Action	Action Level	Limit Level
Construction phase	If the Action Level is exceeded the ET Leader should inform all parties (Contractor, Project Proponent, EPD, AFCD and IEC). The data from the water quality monitoring should also be reviewed. If the water quality monitoring shows no attributable effects of the installation works, then the Action Level is not triggered. If the water quality data indicate exceedances (for SS and/or turbidity) the ET Leader should discuss with the Contractor the most appropriate method of reducing suspended solids during dredging (e.g. reduce the rate of dredging), and/or control sedimentation during earth works (e.g. check the intactness and effectiveness of the temporary drainage system and stream buffer zone). This mitigated method should then be enacted on the next working day.	If the Limit Level is exceeded the ET Leader should inform all parties (Contractor, Project Proponent, EPD, AFCD and IEC) immediately. Should the Limit Level be exceeded, the contractor should stop dredging and/or earth works immediately and work out the solution according to the requirements of EPD and AFCD. The ET Leader should inform the Contractor to suspend dredging and/or earth works until an effective solution is identified. Once the solution has been identified and agreed with all parties dredging and/or earth works may commence
Operation phase	If the Action Level is exceeded the ET Leader should inform Golf Course Operator, EPD, and AFCD. The data from the water quality monitoring should also be reviewed. If the water quality monitoring shows no attributable effects of the installation works, then the Action Level is not triggered. If the water quality data indicate exceedances (salinity and/or pesticides) the ET Leader should discuss with the Golf Course Operator the most appropriate method of reducing salinity (e.g. reduce the daily operation time of the desalination plant), and/or control chemicals from runoff (e.g. reduce the frequency and quantity of chemical applied, check the intactness and effectiveness of the closed drainage system and stream buffer zone). This mitigated method should then be enacted on the next working day.	If the Limit Level is exceeded the ET Leader should inform all parties Golf Course Operator, EPD, and AFCD immediately. Should the Limit Level be exceeded, the Golf Course Operator should stop the operation of the desalination plant and/or the application of chemicals immediately and work out the solution according to the requirements of EPD and AFCD. The operation of the desalination plant and/or the application of chemicals would be suspended until an effective solution is identified.

Categories of Archaeological Finds and Recommended Action

Categories of Archaeological Material	Retrieval Procedure
Human burial • Skeleton remains • Items associated with human burial, i.e. grave goods	Full recording and recovering of human remains and associated features • Complete recoding by photography, drawing, written description • Full measurement of burial and surrounding matrix • Retrieval of human remains and associated materials • Retrieval of surrounding soil for further analysis
Intact features • Structural/architectural remains • Undisturbed context, such as hearth, midden, habitation area, assemblages of artefacts and/or environmental material	Limited recording and recovery of archaeological features • Recording and measurement of salient features by photography, drawing and written description • Retrieval of all archaeological material • Retrieval of samples from the surrounding matrix
Intact artefacts • Complete objects such as pottery, metal objects, stone and bone tools. The objects are complete but isolated and are no part of assemblages or feature.	Recovery of artefacts • Recovery of objects • Sampling of the surrounding matrix • Proper treatment with cleaning, marking and packing under international acceptable standards
Isolated material • Sherds, non-human bone, artefact fragments (metal, pottery, glass). There are no complete objects, the material is isolated and fragmentary in nature.	Recovery of artefact fragments/archaeological material • Recovery of material, such as artefact fragments, environmental material and sampling of surrounding matrix
Deposits with archaeological potential • Soil deposits which exhibit characteristics associated with archaeological remains in Hong Kong	Sampling of the deposit • Collection of soil samples from deposits displaying archaeological potential

Annex D
Implementation status on Environmental Protection Requirements

IMPLEMENTATION SCHEDULE OF THE PROPOSED MITIGATION MEASURES

Table 1 Implementation Schedule of Air Quality Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages**			Relevant Legislation and Guidelines	Implementation Status
					D	C	O		
Air Quality - Construction Phase									
4.7.1		In order that nuisance to air sensitive receivers is minimized, it is important to minimize dust emissions from construction activities including cut and fill operations and trucks movements on haul road. Dust control techniques should be considered to control dust to a level not exceeding the AQOs as well as the 1-hour TSP guideline level. These measures include: • Adoption of good site practices; • Avoid practices likely to raise dust level; • Frequent cleaning and damping down of stockpiles, dusty areas of the Site and the haul roads; • Reduce the speed of the vehicles (say 10 kph) on the haul road; • Reducing drop height during material handling; • Provision of wheel-washing facilities for Site vehicles leaving the Site; • Regular plant maintenance to minimize exhaust emission; • If concrete batching plant or rock crushing plant is planned to used, a license from EPD may be required depending on the total silo capacity since they are specified processes under the APCO. Modern plant should be designed to limit emissions	Work site / during construction	All contractors		√		EIAO-TM, APCO, Air Pollution Control (Construction Dust) Regulation	N/A N/A Insufficient √ √ N/A √ N/A
4.7.2		Providing watering four times a day for dust suppression.							Insufficient

* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.
** D=Design, C=Construction, O=Operation; N/A = Not applicable

Table 2 Implementation Schedule of Water Quality Control Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location	Implementation Agent	Implementation Stages**			Relevant Legislation and Guidelines	Implementation Status
					D	C	O		
Water Quality – Construction phase									
6.11.4 6.11.5		Proposed 18 holes Golf Course Layout Design 20m buffer zones on both sides of the streams will be demarcated as a preventative mitigation measure to reduce the disturbance during construction phase of the golf course except for the portions of Streams A which is of low ecological value and an old tributary of Stream B. On one side of part of the Stream B, the buffer zone would be reduced to 5m. For the construction activity which is unavoidable near natural streams (within the buffer zone), mainly the construction of crossings, preventative mitigation measures during the construction stage should be follow by the Contractor, they are shown as follows: • The proposed works site inside or in the proximity of natural streams should be temporarily isolated, through by placement of sandbags or silt curtains and properly supported by props, to prevent adverse impacts on the stream water qualities; • The natural bottom and existing flow in the stream should be preserved to avoid disturbance to the stream habitats; • No direct and indirect discharge into the natural stream is allowed from any construction work activities; • Stockpiling of construction material, if any, should be properly covered and located away from any natural stream; • Monitor rain forecast closely and cover any exposed spoil when rainstorms are forecasted. Debris should be properly disposed of before rainstorm to avoid any inadvertent wash away into the stream; and • removal of existing vegetation alongside the stream should be avoided. When disturbance to vegetation is unavoidable, all disturbed areas should be hydroseeded or planted with suitable vegetation to blend in with the natural environmental upon completion of works.	Work site / During the construction period	All contractors		√		ProPECC PN 1/94; WPCO; TM-Effluent Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Water	√ Turfing was completed. Temporary drainage system at Holes 2, 9 & 17 provided on site was still considered insufficient and ineffective.
6.11.13		Runoff and Drainage Management ◆ **Diversion of upstream flows around the works areas for stream crossings and underground pipes**: To minimize the impact of upstream runoff on the Works area by preventing storm flows reaching the work areas. This will be done through provision of upstream cut-off drains to intercept the flows and divert them around the Works area. It would convey flows to downstream stream courses, or other elements of temporary drainage systems (such as storage facilities). ◆ **Temporary covering the works areas during severe storm events**: Significant rainstorm events can be reasonably well forecast and when heavy rain is predicted, mitigation measures should be provided for the vulnerable areas by using tarpaulins, plastic sheets or other temporary covering to protect works area and minimize damage and erosion. It is recommended not to cover the newly establishment grass areas, and if unavoidable, this should only to be done on a short term basis (less than 24 hours). ◆ **Silt traps and sedimentation tanks for main discharge routes form works area**: Sufficient and suitably sized silt traps and/or sedimentation tanks should be provided at the downstream ends of the systems to remove suspended solids prior to discharge. The discharge water quality shall be compliant with the *TM on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters* under the WPCO. The required volume of the sedimentation tanks will depend on the catchment area served. Multiple tanks in series may also be required where runoff might be expected to be silty. ◆ The design details of the temporary drainage system at turf establishment area follow the same principles of the permanent drainage system. However the component pipes, tanks, lakes and/or pumps may differ in size, shape, location, etc. from that of the permanent system, dependent upon the temporary runoff areas as compared with those of the permanent system. Additionally or alternatively, the temporary drainage system may consist of other methods to control soil erosion and/or to facilitate the collection of surface water runoff. The temporary drainage system will function during the period of time in which the permanent system is not yet completed. This circumstance will arise from the fact that the golf holes, inclusive of the permanent drainage system, will be constructed individually. As a result, the permanent drainage system may not be completed in its entirety until connection is made from each respective golf hole	Work site / During the construction period	All contractors		√		ProPECC PN 1/94; WPCO; TM-Effluent Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Water	No revised TDMP was submitted the Contractor for RE and ET approval and comment during this reporting month. The latest submitted drainage plan is the mitigation measures for the silty runoff which has not included the recycling the runoff during the turf establishment. The wastewater treatment facility was not provided. Turfing area was completed. Chemical applications were required and applied during the reporting month.

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		area to the lake/reservoir. As the permanent drainage system is completed for each hole, the corresponding temporary system will be decommissioned and reused elsewhere. The temporary drainage system will be in use until the permanent system is functional in a given area. Once the permanent system is functional in a given area, the temporary system will be decommissioned and, wherever possible, the components re-used in another temporary drainage system installed elsewhere. It is anticipated that the maximum duration of use for the temporary drainage system in any given area will be one-year. The storage tanks and/or lakes will be designed to segregate suspended solids (or pollutants as may be the case in plant/equipment storage and refueling areas) as may be necessary by contract requirements and reuse. ◆ No irrigation, fertilizer and pesticide applications to the turf would be permitted during rainstorm events or when heavy rainstorm is predicted 24 hours before the application. • Runoff from materials storage areas, particularly fuel and chemicals storage area should be separated from the main drainage systems (bunded, if necessary) and provided with dedicated facilities throughout the construction period, such as petrol interceptors.							
6.11.14		The Contractor shall follow good site practices and be responsible for the design, construction, operation, and maintenance of all the mitigation measures as specified in *ProPECC PN1/94* on construction site drainage through the construction period. These practices include: • Temporary ditches should be provided to facilitate run-off discharge into appropriate watercourses, via a silt retention pond. • All drainage facilities and erosion and sediment control structures should be inspected monthly and maintained to ensure proper and efficient operation at all times. • Excavation of soil that cannot be avoided during the wet season, and exposed surface or open stockpiles should be covered with tarpaulin or other means. Other measures that need to be implemented before, during and after rainstorms are summarized in *ProPECC PN1/94*. • Exposed soil areas should be minimized to reduce potential for increase siltation and contamination of runoff. • Earthwork final surfaces should be well compacted and subsequent permanent work (turf establishment) should be immediately performed. • The Contractor shall contain within the site all surface runoff generated from the construction works, concreting works, dust control and vehicle washing, etc. • The Contractor shall arrange other measures, such as provision of sand bags or temporary diversion systems to prevent washing away of soil, silt or debris into any nearby natural streams. Any runoff shall be diverted into appropriate sediment traps before discharging to the nearby drainage system. The discharge water quality shall be compliant with the *TM on Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters* under the WPCO. • The Contractor shall observe and comply with the Water Pollution Control Ordinance (WPCO) and its subsidiary regulations by implementing environmental protection measures (such as the use of silt traps) and preventing any point or non-point source of pollution.	Work site / During the construction period	All Contractor		√		ProPECC PN 1/94; WPCO; TM-Effluent Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Water	Same as above

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6.11.15 6.11.16		Concrete bridge construction No work is allowed to come into contact with the underlying stream bed during the concrete bridge construction. During the construction of precast concrete bridge, if necessary, precaution measures should be taken to ensure no potentially polluting liquid or solid wastes fall into the stream. This is essential to avoid water quality impacts within ecologically sensitive streams. The Contractor shall good site follow practices, including, but no limited to:: • Construction work area for the precast concrete should be outside the designated stream buffer zone area; • The designated work area for precast concrete work should be covered to minimize the potential water runoff during rain from the construction area; • All water used within the concrete work area should be collected, stored and recycled to reduce resource consumption. Stormwater runoff from the works areas fro precast concreting works should drain under gravity towards a sedimentation basin. The overlying water from the sedimentation basin should be recycled for reuse within the plant. The deposited sediment should be dewatered and the dry matter should require disposal off-site. No water should be discharged outside the boundary of the precast concrete works area; • The use of tarpaulin sheet or other means (water impermeable texture) should be placed beneath precast concrete beam level (must be above the stream bed level) to capture any falling object during installation of precast concrete bridge on the footings or abutments; • Prohibition of any direct and indirect discharge into the streams; • The concrete bridge and footings of abutments must be completely above the high water mark; • All equipment and machinery must be free of leaks or excess oil and grease; • Equipment refueling or servicing or storage of fuel must be undertaken at a minimum of 30 meters from the stream; • Prevent soil and trash from getting into stream during construction by use of silt fence, fiber rolls, gravel bags and other effective means; • All bare soil (abutment slope or temporary stockpile) must be covered with tarpaulin or other means before forecast rain; and • Wash out concrete trucks or pumps only into designated washout pits.	Work site / During the construction period	All contractors		√		ProPECC PN 1/94; WPCO; TM-Effluent Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Water	Construction of all permanent bridges was completed before March 2007. Decking/finishing work of all bridges was completed during the reporting month.
6.11.19 6.11.20 6.11.21 6.11.22		Dredging during Construction of Desalination Plant's intake and outfall The intake and outfall pipelines will be constructed by dredging the seabed to form a trench and backfilled with a layer of bedding material (quarry run stone) before putting the pipelines in place. Once in place, the pipelines are covered with layers of rock armour on top of the pipelines to protect the pipelines against damage by wave action. The alternative backfilling material is from rock excavated during site formation if suitable. The materials used for the backfilling at the intake and outfall pipelines are stone and rock armour only. Transfer of backfilling materials onto the seabed from barge should be conducted by careful grabbing and unloading to seabed (to minimize sediment migration), thereby minimize impacts on water quality to nearby water sensitive receivers. As a preventative measures, silt curtain will also be required during the backfilling activities. The expected backfilling duration is approximate 2 months. The Contractor shall use backhoe for dredging works at a water depth of less than 2m and use close grab dredger for works with water depth of more than 2m. The estimated dredging works is about 50m long (where backhoe should be used for water less than 2m deep) and 70m long (where close grab dredger should be used for water more than 2m deep). Only one dredging method should be used at any one time. In order to avoid pollution during dredging, transporting and dumping of marine mud. Pollution avoidance measures shall include but not be limited to the following: • The maximum daily dredging rate for closed grab dredger should be $45m^3$/day; • The maximum daily dredging rate for backhoe should be $20m^3$/day; • Silt curtain should be installed for any dredging methods to protect the WSRs; • Closed grabs or sealed grabs should only be used for locations with water depths $\geq$ 2m; • Backhoe should only be used for locations with water depths $\leq$ 2m; • All equipment should be designed and maintained to minimise the risk of silt and other contaminants being released into the water column or deposited in locations other than designated location;	Work site / During the construction period	All contractors		√		ProPECC PN 1/94; WPCO; TM-Effluent Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Water	No dredging work for the desalination plant pipelines was carried out. Application of the discharge licence of the desalination plant was on-going.

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		• Mechanical grabs should be designed and maintained to avoid spillage and should seal tightly while being lifted; • No trailing suction hopper dredgers would be deployed for the dredging of marine mud; • All vessels should be sized such that adequate clearance is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; • All pipe leakages should be repaired promptly and plant shall not be operated with leaking pipes; • Before moving the vessels which are used for transporting dredged materials excess material should be cleaned from the decks and exposed fittings of vessels and the excess materials should never be dumped into the sea except at the approved locations; • Adequate freeboard should be maintained on barges to ensure that decks are not washed by wave action; • The Contractor should monitor all vessels transporting material to ensure that no dumping outside the approved location takes place. The contractor should keep and produce logs and other records to demonstrate compliance and that journey times are consistent with designated locations and copies of such records should be submitted to the engineer; • All bottom dumping vessels should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; • Loading of barges and hoppers should be controlled to prevent splashing of dredged material to the surrounding water, and vessels should not be filled to a level which will cause overflowing of material or polluted water during loading or transportation; and • The engineer may monitor any or all vessels transporting material to check that no dumping outside the approved location nor loss of material during transportation takes place. The contractor should provide all reasonable assistance to the engineer for this purpose.							
6.11.23		In addition, baseline water quality monitoring before commencement of the marine works shall be carried out in the nearby waters to obtain baseline information for subsequence monitoring. Regular and frequent water quality monitoring shall be carried out throughout the whole construction period to ensure the water quality during construction is well within the established environmental guidelines and standards.							
6.11.24		Silt Curtain In order to minimize impacts during the whole construction period of desalination plant's intake and discharge outfall, silt curtains should be utilized to minimize sediment migration. The Contractor shall be responsible for the design, installation and maintenance of the silt curtains to minimize the impacts on the water quality and the protection of water sensitive receivers. The design and specification of the silt curtains shall be submitted by the Contractor to the Engineer for approval. Area of the silt curtain to enclose the works area should be minimized in order to reduce the disturbance of ecological sensitive areas nearby.							
6.11.25		A typical suspended solids reduction of 75% can be achieved with the incorporation of silt curtain. Two-layer silt curtains have generally been used for dredging projects of larger scale to further ensure this reduction. However, as the scale of proposed project is considered small, it is recommended to use single layer silt curtain which can achieve a minimum 75% suspended solids reduction.							
6.11.26		Silt curtains shall be formed from tough, abrasion resistant, permeable membranes, suitable for the purpose, supported on floating booms in such a way as to ensure that the sediment plume shall be restricted to within the limit of the works area.							
6.11.27		The silt curtain shall be formed and installed in such a way that tidal rise and fall are accommodated, with the silt curtains always extending from the surface to the bottom of the water column. The removal and reinstallation of such curtains during typhoon conditions shall be as agreed with the Director of Marine Department.							
6.11.28		The Contractor shall regularly inspect the silt curtains and check that they are moored and marked to avoid danger to marine traffic. Any damage to the silt curtain shall be repaired by the Contractor promptly and the works shall be stopped until the repair is effected to the satisfaction of the Engineer.							

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					D	C	O		
		<u>General Construction Activities</u>							
6.11.29		Debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering adjacent watercourse. Stockpiles of construction materials should be kept covered when not being used.	Work site / During the construction period	All contractors		√		ProPECC PN 1/94; WPCO; TM-Effluent Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Water	Construction waste disposed off-site was reported. 50 chit tickets were approved by EPD in December 2007. 28 chit tickets were used in December 2007.
6.11.30		Oils and fuels should only be stored/handled in designated areas with pollution prevention facilities. Oil interceptors need to be regularly inspected and cleaned to avoid wash-out of oil during storm conditions.							Not observed
6.11.32		All fuel tanks should be provided with locks and be sited on sealed areas within bunds of capacity equal to 110% of the storage capacity of the largest tank.							✓
6.11.33		Good housekeeping practices and staff training are required to minimize careless spillage and keep the work space in a tidy and clean conditions at all times. Accidental spillage of chemicals in the works area would directly affect the aquatic environment. It is recommended that the Contractor should develop management procedures for chemical and implement an emergency plan to deal with chemical spillage in case of an accident.	Work site / During the construction period	All contractors		√		ProPECC PN 1/94; WPCO; TM-Effluent Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Water	Not observed
6.11.34		Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The chemical waste should be transported to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Facility at Tsing Yi. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes details the requirements to deal with chemical wastes.							No disposal record was received during the reporting month. The chemical waste storage area was located at temporary barging point.
		<u>On-Site Sewage Effluents</u>							
6.11.35		In order to prevent sewage effluents affecting water courses, the following mitigation measures should be provided by the Contractor:- • Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site to handle sewage from the workforce; • The toilet facilities should be more than 30 m from any watercourse; • Temporary storage tank should be provided to collect wastewater from kitchens or canteen, if any; • A licensed waste collector should be deployed to clean the chemical toilets on a regular basis which will be and disposed of at government sewage treatment facilities • Regular environmental audit on the construction site can provide an effective control of any malpractices and can achieve continual improvement of environmental performance on site. It is anticipated that sewage generation during the construction phase of the project would not cause water pollution problem after undertaking all required measures; and • Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the project.							√. A sewage treatment plant (STP) was provided at the site office. Approximate five mobile toilets were available on site at southern portion of the construction site. The STP and most of the mobile toilets were removed off-site. No sewage disposal record was submitted by the Contractor during the reporting month. No canteen was available. Not observe. √ Not observed
		<u>Concrete batching plant</u>	Work site / During the construction period	All contractors		√		ProPECC PN 1/94; WPCO; TM-Effluent Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Water	The concrete batching plant was dismantled.
6.11.36		All water used within the concrete batching plant will be collected, stored and recycled to reduce resource consumption. This includes water used in the concrete batching process, truck cleaning, yard washing and dust suppression spraying. All spent dust suppression effluent will be collected and recycled. To minimize the potential water quality impacts that may generate from the concrete batching plant, a drainage system should be provided in this site. The batching plant area should be channelled to collect concrete washings for further treatment before reuse on-site and prevent concrete washings from directly entering the any stream or seawater. Site runoff should also be collected through the drainage system. To minimize the generation of contaminated site runoff from concrete production area, the concrete batching plant should be sheltered.								
6.11.37		Concrete washings and site runoff should be pumped to a wastewater treatment system with a sedimentation unit for removal of suspended solids such as waste concrete particles, silt and grit in order to achieve the discharge standards. pH adjustment should also be applied if the pH value of the collected concrete washings and site runoff is higher than the pH range specified in the discharge licence. This can be achieved by adding neutralizing regents, i.e. acidic additive. A discharge licence should be applied from EPD for discharge of effluent from the site. Analysis of effluent quality may be required as one of the licensing conditions of the discharge licence. The Contractor should collect effluent samples at the final discharge point in accordance with the required sampling frequency to test the specified water quality								

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		parameters. The quality of the discharged effluent should comply with the discharge licence requirements. It is recommended to reuse the treated effluent for dust suppression and general cleaning on site, wherever possible.							
6.11.38		The drainage system should be maintained on a regular basis to remove the deposits on the channels. The sedimentation and pH adjustment systems should also be checked and maintained by competent persons to ensure that the systems are functioning properly at all times.							
6.11.39		The deposited sediment will be dewatered and the dry matter will require disposal off-site. The estimated maximum concentrate batching operation period during construction is 20 months.							
6.11.40		Sand, gravel and other bulk materials will be delivered from the production area by conveyor boats or derrick barges to the temporary barging point, and the material will then be loaded onto dump trucks by loaders and delivered to the on-site storage areas.							
6.11.41		Regular environmental inspections should be conducted to check the environmental performance of daily operation. These inspections will ensure proper installation and maintenance of pollution control measures, such as checking of sedimentation basin, wastewater recycling facility and enclosure of stockpiles, and the implementation of other mitigation measures.							

* All recommendations and requirements resulted during the course of EIA/EA Process, including ACE and/or accepted public comment to the proposed project.
** Des - Design, C = Construction, O = Operation
N/A Not applicable

Table 3 Implementation Schedule of Waste Management Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages **			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
Waste Management - Construction Phase									
7.7.2		Good site practice to minimize solid waste generation, including: ◆ nomination of approved personnel, such as a site manager, to be responsible for good site practices, and making arrangements for collection of all wastes generated at the site and effective disposal to an appropriate facility; ◆ training of site personnel in proper waste management and chemical waste handling procedures; ◆ provision of sufficient waste disposal points and regular collection for disposal; ◆ appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers; ◆ regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors; ◆ a Waste Management Plan should be prepared and should be submitted to the Engineer for approval. One may make reference to ETWB TCW No. 15/2003 for details; and ◆ a recording system for the amount of wastes generated, recycled and disposed (including the disposal sites) should be proposed.	Work site / During the construction period	All Contractors		√		WDO; Public Health and Municipal Services Ordinance; The Land (Miscellaneous Provisions) Ordinance; ETWB TCW NO. 15/2003.	Construction Waste: Disposal recorded was received during the reporting month. Domestic Waste: No disposal recorded was received during the reporting month.
7.7.4		Good management and control can prevent the generation of significant amounts of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include: ◆ segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; ◆ separate labelled bins shall be provided to segregate aluminium cans from other general refuse generated by the work force, and to encourage collection of by individual collectors; ◆ any unused chemicals or those with remaining functional capacity shall be recycled; ◆ maximising the use of reusable steel formwork to reduce the amount of C&D material; ◆ prior to disposal of C&D waste, it is recommended that wood, steel and other metals shall be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill; ◆ proper storage and site practices to minimise the potential for damage or contamination of construction materials; ◆ plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste; ◆ minimize over ordering of concrete, mortars and cement grout by doing careful check before ordering.	Work site / During the construction period	All Contractors		√		WDO; Public Health and Municipal Services Ordinance; The Land (Miscellaneous Provisions) Ordinance; ETWB TCW NO. 15/2003.	N/A N/A N/A N/A N/A N/A N/A N/A
7.7.6 7.7.7		<u>Site Clearance Waste</u> Scrub and other vegetation will be stripped for the tees, fairways, greens and access roads. The normal route for disposal for such material is landfill but in this case it is proposed that vegetation is passed through a "chipper" to break down the material into a medium that can be used as mulch / compost and provide a seed-bank for natural hydroseeding of exposed areas. Non-inert materials should be kept separate and reused on-site as fill in preference to disposal at public filling areas which are operated by CEDD or disposal at landfill.	Work site / During the construction period	All Contractors		√		WDO; Public Health and Municipal Services Ordinance ; The Land (Miscellaneous Provisions) Ordinance; ETWB TCW NO. 15/2003.	All vegetated area within the construction area was removed and disposed off-site in March 2007. N/A
7.7.8		<u>Excavated Materials</u> Material generated during open cut works, and access route formation will comprise rock and soil and all this material will be reused in the site shaping process. It is anticipated that there will be no material requiring disposal off-	Work site / During the construction period	All Contractors		√		WDO; Public Health and Municipal Services Ordinance; The Land (Miscellaneous Provisions) Ordinance;	N/A

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		site in public filling areas.						ETWB TCW NO. 15/2003.	
7.7.9		Construction and Demolition (C&D) Material The C&D material generated from the site formation and demolition works should be sorted on-site into inert C&D material and C&D waste. In order to minimise the impact resulting from collection and transportation of C&D material for off-site disposal, the excavated material comprising fill material should be reused on-site as backfilling material. C&D waste, such as wood, plastic, steel and other metals should be reused or recycled and, as a last resort, disposed of to landfill. A suitable area(s) should be designated within the site for temporary stockpiling of C&D material and to facilitate the sorting process. The stockpiling/sorting area should be located far away from the identified sensitive receivers.	Work site / During the construction period	All Contractors		√		WDO; Public Health and Municipal Services Ordinance; The Land (Miscellaneous Provisions) Ordinance; ETWB TCW NO. 15/2003.	No sorting of construction waste was observed and improper stockpiles were observed at the temporary barging point.
7.7.10		Site fencing Some site fencing may be required. Attention should be paid to WBTC No. 19/2001 which introduce a new policy requiring the use of metallic site hoardings and signboards in order to reduce the amount of timber used on construction sites.	Work site / During the construction period	All Contractors		√		WBTC No. 19/2001	N/A
7.7.12 7.7.14 7.7.15 7.7.16 7.7.17 7.7.18		Chemical Waste Where the construction processes produce chemical waste, the Contractor must register with EPD as a Chemical Waste Producer. Wastes classified as chemical wastes are listed in the *Waste Disposal (Chemical Waste) (General) Regulation*. These wastes are subject to stringent disposal routes. EPD requires information on the particulars of the waste generation processes including the types of waste produced, their location, quantities and generation rates. A nominated contact person must be provided. Hard standing surfaces draining via oil interceptors shall be provided in works area compounds. Interceptors will be regularly emptied to prevent release of oils and grease into the surface water drainage system after accidental spillages. The interceptor should have a bypass to prevent flushing during periods of heavy rain. Oil and fuel bunkers should be bunded to prevent discharge due to accidental spillages or breaches of tanks. Waste collected from any grease traps should be collected and disposed of by a licensed contractor. Any construction plant which is likely to leak oil, should have absorbent inert material e.g. sand, placed beneath it. This material should be replaced on a regular basis and the contaminated material should be stored in a designated, secure place. Any sand used for soaking oil waste is classified as chemical waste and should be disposed of in accordance with the *Waste Disposal (Chemical Waste) (General) Regulations*. Lubricants and waste oils are likely to be generated during the maintenance of vehicles and mechanical equipment. Used lubricants will be collected and stored in individual containers which are fully labelled. The containers should be stored in a designated secure place. If possible such waste should be sent to oil recycling companies; there are also companies which collect empty oil drums for reuse or refill. Oil and lubricant wastes are classified as chemical wastes, and if not recycled, should be collected by licensed collector and should be treated at the Chemical Waste Treatment Centre, Tsing Yi, or other sites licensed for disposal of waste oil. A trip ticket system operates to control the movement of such chemical waste and tickets have to be produced upon the request of EPD. Some paints and solvents are classified as chemical waste and, if used on site, will be subject to the stringent requirements of the *Waste Disposal (Chemical Waste) (General) Regulation.* Empty paint cans should be	Work site / During the construction period	All Contractors		√		Waste Disposal (Chemical Waste) (General) Regulation	As most of the heavy equipments and trucks were leaving the construction site. The temporary chemical storage area is relocated at the temporary barging point.

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages **			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
7.7.19		recycled or collected as waste. Any dry paint waste should be swept up and collected in containers for disposal. No lubricants, oils, solvents or paint products should be allowed to discharge into water courses, either by direct discharge, or as contaminants carried in surface water runoff from the construction site.							
7.7.20		<u>Sewage</u> An adequate number of portable toilets should be provided for the on-site construction workforce. The portable toilets shall be maintained in a state that will not deter the workers from using them.	Work site / During the construction period	All Contractors		√		WDO; Public Health and Municipal Services Ordinance; The Land (Miscellaneous Provisions) Ordinance; ETWB TCW NO. 15/2003.	N/A
7.7.21 7.7.22		<u>General Refuse</u> General refuse should be stored in enclosed bins or compaction units separate from C&D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&D material. An enclosed and covered area is preferred to reduce the occurrence of 'wind blown' light material. Solid and liquid wastes will be generated by the construction workers during the clearance/construction period. The refuse (mainly non-recyclable materials) will be collected regularly in black refuse bags and delivered to the existing solid waste disposal system and transferred to landfill for disposal.	Work site / During the construction period	All Contractors		√		WDO; Public Health and Municipal Services Ordinance; The Land (Miscellaneous Provisions) Ordinance; ETWB TCW NO. 15/2003.	N/A
7.7.23 7.7.25		<u>Marine Sediments</u> The basic requirements and procedures for dredged mud disposal are specified under the ETWB TCW No. 34/2002. The management of the dredging, use and disposal of marine mud is monitored by the Marine Fill Committee (MFC), while the licensing of marine dumping is the responsibility of the Director of Environmental Protection (DEP). The dredged marine sediments will be loaded onto barges and transported to the designated disposal site. During transportation and disposal of the dredged marine sediments, the following measures should be taken to minimise potential impacts on water quality: ◆ Bottom opening of barges shall be fitted with tight fitting seals to prevent leakage of material. Excess material shall be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved. ◆ Monitoring of the barge loading shall be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels shall be equipped with automatic self-monitoring devices as specified by the DEP.	Marine Dredging area / During the construction period	All Contractors		√		ETWB TCW NO. 34/2002.	No dredging works was carried out during the reporting month.

* All recommendations and requirements resulted during the course of EIA Process, including ACE and/or accepted public comment to the proposed project.
** D=Design, C=Construction, O=Operation; N/A = Not applicable

Table 4 Implementation Schedule of Ecological Impact Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
Construction Phase									
8.7.1		Terrestrial Ecology Haul roads would be located on future fairway and cart paths alignments to minimise temporary disturbance of habitats.	Work site / During the construction period	All Contractor		√		-	N/A
8.6.39		Avoid disturbance of stream bed during the construction of the permanent bridges by using precast unit of the bridge segments transported from other locations and installed to the proposed locations.	Stream crossing/ During the construction period	All Contractor		√		-	N/A
8.7.4		Good site practice. Construction materials must be stored at locations away the stream courses. Site runoff would be desilted in settling ponds to reduce the potential for suspended sediments, organics and other contaminants to enter stream and marine environment.	Work site / During the construction period	All Contractor		√		-	No silty runoff was observed during the reporting month.
8.9	Table 4.1	Streams B, C, and D will be monitored monthly during the construction phase to determine the status of *Caridina trifasciata* (shrimp) and *Nanhaipotamon hongkongensis* (freshwater crab). Stream condition will be recorded with reference to the protective buffer zone. Encroachment onto the buffer zone will be reported to the ER/ET. Sheet piling will be installed at the buffer zone perimeter as needed to prevent further encroachment. Stream sedimentation will be reported to the ER/ET, the agent causing sedimentation will be discovered, and sedimentation will be stopped.	Stream B, C & D/ During the construction phase	All Contractor		√			Monitoring has been carried out during this reporting month. Reinstated planting / hydroseeding at the buffer zone area of Stream A was considered not in good condition. Very low abundance of *Caridina trifasciata* (shrimp) was observed at Streams B and C during the ecology survey.
9.7.22		Marine Ecology The temporary drainage system, which would receive flows from all areas subject to earth works, would collect all site runoff. The collected runoff would be retained for turf grass irrigation.	Work site / During the construction period	All Contractor		√			N/A
9.8.5		Dredging for the two pipelines for the desalination plant would be require 50 days and would be scheduled to the extent possible from January to April 2006. This would avoid the flowering season for the seagrass *Halophila ovalis*, i.e. November and December (Fong et al. 2005) and the spawning season for corals, i.e. July to October (Lam 2000; Storlazzi, C. D. 2004).	Dredging area/ during dredging period	All Contractor		√			N/A
9.8.2	4.2.12	Coral colonies within the silt curtain, in particular the 79 colonies identified during the coral mapping survey, (see Appendix A9.2) would be transplanted. Prior to commencement of any marine construction works for the proposed project, the affected coral colonies would be tagged using plastic labels and a number would be assigned to each. The tagged corals in the dredging area at D2 site will be transplanted to the bedrock area about 80 m south of the ferry pier. All these transplantation works should be conducted by experienced marine ecologist(s) and should be completed before the commencement of marine construction works.	Dredging area/Prior to dredging	All Contractor		√			N/A
9.8.5		Silt curtains will be deployed during dredging for the desalination plant. With the deployment of silt curtains around the dredging area for the desalination plant, adverse water quality impacts associated with the dredging and backfilling would be controlled to acceptable levels.	Dredging area/Prior to dredging	All Contractor		√			N/A
		All anchoring points/structures of the floating pier would be located on the shore and/or at least 40m seaward to avoid the coral colonies at Site B2 which are concentrated within the first 15m seaward from the coastline and none recorded over 35m seaward.	Temporary barging point/ during construction of the barging point	All Contractor		√			Floating pontoon was located at designated location according to EP during the reporting month. The tentative programme for the removal temporary barging point will be in January 2008.
		The location of the floating pier would also be shifted from the original location for barging point at Zone 2 and Zone 3 of the mapping area in Site B2 (see Figure 2 in Appendix A9.2), to Zone 5 to further protect corals. Impacts to corals are not expected.	Temporary barging point/ during the entire construction phase	All Contractor		√			√

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** D=Design, C=Construction, O=Operation
N/A Not applicable

Table 5 Implementation Schedule of Fisheries Impact Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages**			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
10.8.2		Construction phase In addition to the temporary drainage system which would collect site runoff for re-use for irrigation, site runoff would also be controlled by general site practices during the construction period.	Work site / During the construction period	All Contractor		√		N/A	Not observed
10.8.3		Silt curtains will be deployed during dredging for the desalination plant. With the deployment of silt curtains around the construction area, adverse water quality impacts associated with the dredging and back-filling would be controlled.	Work site / During the construction period	All Contractor		√		N/A	No dredging work for the desalination plant was carried out during the reporting month.
10.7.12		The majority of the heavy construction works, in particular, the cut and fill earth works, would be conducted within the 2005-2006 dry season.	Work site / During the construction period	All Contractor		√		N/A	N/A

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** D=Design, C=Construction, O=Operation
N/A Not applicable

Table 6 Implementation Schedule of Landscape and Visual Impact Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages **			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
Landscape and Visual Impact - Construction Phase									
Table 12.13	MC1	Site offices and construction yards: • Site offices and the construction yard shall be decommissioned after construction. • Haul roads shall be decommissioned and restored with hydroseeding works after construction.	All site offices	All contractors		√		EIAO Guidance Note No. 8/2002	Complied
Table 12.13	MC2	Height of site offices: • The height of site offices shall be controlled in order to avoid visual impacts.	All site offices	All contractors		√		EIAO Guidance Note No. 8/2002	Complied. A two-storey high site office painted in green color has been constructed.
Table 12.13	MC3	Hoarding and screening: • Where practical the site offices areas, construction yards and storage areas shall be screened using olive green coated hoarding or vegetation around the peripheries of the works area until the completion of relevant construction phases.	All site office and construction yard areas.	All contractors		√		EIAO Guidance Note No. 8/2002	Hoarding along the site boundary was dismantled.
Table 12.13	MC4	Construction plant and building material: • Shall be orderly and carefully stored in order to appear neat and avoid visibility from outside where practical; • Excess materials shall be removed from site as soon as practical; • All construction plant shall be removed from site upon completion of construction works.	In all construction yards.	All contractors		√		EIAO Guidance Note No. 8/2002	Complied.
Table 12.13	MC5	Construction light: • To be oriented away from the viewing location of VSRs; and • All lighting shall have frosted diffusers and reflective covers. • While construction at night might be required from time to time, this should be controlled and minimised.	All construction lights.	All contractors		√		EIAO Guidance Note No. 8/2002	N/A
Table 12.13	MC6	Vegetation: • Temporary construction sites shall be restored to standards as good as, or better than, the original condition. In this respect, areas that are not covered by golf course grassing works shall be hydro seeded; • The potential for soil erosion shall be reduced at the construction stage by minimizing the extent of vegetation disturbance on site and providing a protective cover over exposed ground; and • No plant or building materials shall be stored under the dripline of retained trees and no vehicle movement or other construction activities like washing, concrete mixing etc shall be carried out under the dripline of trees.	All temporary construction sites.	All contractors		√		EIAO Guidance Note No. 8/2002	Hydroseeding has been carried out for erosion control but erosion occurred especially to the Restoration Slope. Complied.
Table 12.13	MT1	Compensation for losses: • The tree compensation to tree loss ratio shall be between 1:2 and 1:3; • At least 700 new trees shall have be of light standard or larger size.	As shown on mitigation measures plans.	All contractors	√	√		EIAO Guidance Note No. 8/2002	Design Stage: Complied Construction Stage: In progress
Table 12.13	MT2	The majority of compensation species shall comprise species that already occurs within the LIA boundaries;	General.	All contractors	√	√		EIAO Guidance Note No. 8/2002	Design Stage: Complied. Construction Stage: In progress
Table 12.13	MT3	Where practical, trees that require removal shall be transplanted on Site;	General.	All contractors	√	√		EIAO Guidance Note No. 8/2002	Design Stage: Complied Construction Stage: Partial completed of transplantation works on site.
Table 12.13	MT4	New trees shall be planted in groups in order to screen visual impacts and to provide additional shade at the administration building, rain shelters and halfway houses.	As shown on mitigation measure plans.	All contractors	√	√		EIAO Guidance Note No. 8/2002	Design Stage: Complied Construction Stage: Tree planting are being carried out but the quality of most of the planted tree are in poor condition.

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages **			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
Table 12.13	MT5	Tree Planting on Slopes: • New slopes with a gradient larger than 30^{o} shall have whip tree planting. • Such whip trees shall comprise tree species with shrub-like characteristics, such as *Gordonia axillaries* (大頭茶) and *Raphiolepis indica* (車輪梅).	General.	All contractors	√	√		EIAO Guidance Note No. 8/2002	Design Stage: Complied Construction Stage: In progress.
Table 12.13	MT6	Tree planting works at the hill where the desalination plant will be located shall be carefully positioned in order to represent its original profile.	At the desalination plant.	All contractors	√	√		EIAO Guidance Note No. 8/2002	Design Stage: Complied Construction Stage: Completed
Table 12.13	MT7	Tree Preservation: • No tree shall be transplanted or felled without prior approval by relevant Government departments in accordance with WBTC 24/94, WBTC 14/2002 and ETWB 2/2004; • All trees that are marked for retention shall be fenced off with a 1.2m high fence around the dripline of trees or larger area; • Transplant preparation works shall be carried as soon as possible after commencement of construction. Rootball and crown pruning shall be carried out over at least 1 month.	All areas with existing trees	All contractors	√	√		WBTC 24/94, WBTC 14/2002, ETWB 2/2004	Design Stage: Tree felling approved.
Table 12.13	MT8	Buffer Areas • For streams the width of the buffer zones will be 20m from the stream bank. The only exception would be the buffer zone in the reach of upper tributary of stream B lying between the two parts of Hole 10, where the buffer will zone will be 5m, the dry tributary of stream B that will be converted to an underground culvert and the secondary tributary of stream A that will also be converted to an underground culvert. • No construction activities will be allowed in the buffer zones, except for site formation works, which are required for the construction of bridge footings.	At streams	All contractors	√	√		EIAO Guidance Note No. 8/2002	Design Stage: Complied Construction Stage: No works in buffer areas at present.
Table 12.13	MS1	Bulk hydroseeding: • Bulk site formation works shall be followed with bulk hydroseeding as soon as practical.	General.	All contractors		√		EIAO Guidance Note No. 8/2002	Design Stage: Complied Construction Stage: Hydroseeding completed.
Table 12.13	MS2	Grassing: • In the case of golf course areas, grassing shall be carried out as soon as practical after sanding and shaping; and • Sanding, shaping and grassing works shall be phased in sections.	At proposed grassing areas.	All contractors		√		EIAO Guidance Note No. 8/2002	Construction Stage: Completed.
	MS3	Restoration: • In the case of residual areas that were disturbed during construction, which will not be part of the golf course areas, detailed site formation works and shaping shall be followed by hydroseeding and shrub planting as soon as practical; and • The hydroseeding mix shall be composed of the following grass species*: Erograstic curvula Lolium Perenne Neyraudia reynaudiana Pennisetum purpureum*; and the following shrub / small tree species: *Gordonia axillaries, Rhaphiolepis indica* and *Rhodomyrtus tomentosa.*	At all residual areas.	All contractors		√		EIAO Guidance Note No. 8/2002	Design Stage: Complied Construction Stage: Completed but some of the planted shrubs were withered due to inadequate watering.
Table 12.13	ME1	Screening: • Bridges and pumping stations shall be screened by tree and shrub planting; and • Retaining wall shall be covered with climber plants.	All bridges and pumping stations.	All contractors	√	√		EIAO Guidance Note No. 8/2002	Design Stage: Complied Construction Stage: In progress.
Table 12.13	ME2	Abutments of bridges shall be surfaced with stone of volcanic origin with a colour and texture similar to that of rock in the surrounding landscape;	All bridges.	All contractors	√	√		EIAO Guidance Note No. 8/2002	Design Stage: Complied Construction Stage: Completed.

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages **			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
Table 12.13	ME3	Above-ground walls and foundations of pumping stations shall be surfaced with stone of volcanic origin with a colour and texture similar to that of rock in the surrounding landscape.	All pumping stations.	All contractors	√	√		EIAO Guidance Note No. 8/2002	Design Stage: Complied Construction Stage: Completed.
Table 12.13	ME4	Above-ground covers of pumping stations shall have an olive green coating.	All pumping stations.	All contractors	√	√		EIAO Guidance Note No. 8/2002	Design Stage: Complied Construction Stage: In Progress.
Table 12.13	ME5	The desalination plant shall be located within the hill behind the pier. Slope cutting of this hill shall have a natural appearance with hydroseeding cover.	As shown on the mitigation measure plans.	All contractors	√	√		EIAO Guidance Note No. 8/2002	Design Stage: Complied Construction Stage: Desalination plant has been constructed. Landscape work to be commenced.
Table 12.13	ME6	Water tanks shall be located below surface level. Above-ground components shall be coated in olive green.	All water tanks.	All contractors	√	√		EIAO Guidance Note No. 8/2002	Design Stage: Complied Construction Stage: In Progress.
Table 12.13	MB1	Extensions of the clubhouse shall have a surface cover that is in visual harmony with the clubhouse itself.	All new extensions of the clubhouse.	All contractors	√	√		EIAO Guidance Note No. 8/2002	Design Stage: Complied Construction Stage: Completed.
Table 12.13	MB2	Shrub planting shall be implemented in front of the new golf cart parking area in order to screen low-level views.	The new golf cart parking area.	All contractors	√	√		EIAO Guidance Note No. 8/2002	Design Stage: Complied Construction Stage: Completed
Table 12.13	MB3	Tree and shrub planting shall be implemented on the peripheries of the maintenance building and its extensions.	At the maintenance building.	All contractors	√	√		EIAO Guidance Note No. 8/2002	Design Stage: Complied Construction Stage: Completed.
Table 12.13	MB4	Halfway houses and rain shelters shall be surfaced with either stone or beige and olive green paint.	At all halfway houses and rain shelters.	All contractors		√		EIAO Guidance Note No. 8/2002	Design Stage: Complied Construction Stage: Completed.

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** D=Design, C=Construction, O=Operation
N/A Not applicable

Table 7 Implementation Schedule of Cultural Heritage Mitigation Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages **			Relevant Legislation & Guidelines	Implementation Status
					D	C	O		
Construction Phase									
Table 13.4		Wan Chai Archaeological Site - Archaeological Watching Brief	Site formation and construction works	All Contractors		√		EIAO	Watching brief at Hole 2 was completed in February 2007.
Table 13.4		Grave #1 – Preservation in-situ - Fenced off three metre buffer zone around the grave	Site formation and construction works	All Contractors		√		EIAO	Buffer zone fencing was provided around at Grave 1.
Table 13.4		Grave #5 - Preservation by record; and recovery of structural elements (if required by AMO)	Construction phase (prior to commencement of works)	All Contractors		√		EIAO	The revised golf course design will not disturb the Grave 5 and will keep in-situ. No preservation record for this grave is required.
Table 13.4		Grave #20 - Preservation by record; and recovery of structural elements (if required by AMO)	Construction phase (prior to commencement of works)	All Contractors		√		EIAO	The preservation by record was completed in 23rd October 2006 and submitted to AMO for record.
Table 13.4		Any, as of yet unidentified graves at Kap Lo Kok. If a grave is found works will stop in the immediate vicinity of the grave until it can be inspected by AMO staff.	Site formation and construction works	All Contractors		√		EIAO	√

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** D=Design, C=Construction, O=Operation
N/A Not applicable

Table 8 Implementation Schedule of Land Contamination Mitigation Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages **			Relevant Legislation & Guidelines	Implementation status
					D	C	O		
Land Contamination - Construction Phase									
11.9.2		Since the exact cut areas on site during construction by the Contractor have not been determined at this stage, the Contractor should implement the suitable precautions and preventive measures for the discovery of buried or abandoned ordnance during the construction. Moreover, it is recommended that standard good practice should be implemented during the construction phase in order to minimize any potential exposure to contaminated soils or groundwater. These measures include: • The Contractor should sweep the area of intended excavation with a metal detector to check any ordnance underneath the ground prior to any excavation. • For any detection of metals under the ground, the Contractor should cease work immediately before confirming the identity of the cause. For any suspect of artillery ordnance, Hong Kong Police Force should be informed. • The use of bulk earth-moving excavator equipment would minimise construction workers' potential contact with the contaminated materials; • Exposure to any contaminated materials can be minimised by the wearing of appropriate clothing and personal protective equipment such as gloves (when interacting directly with suspected contaminated material), providing adequate hygiene and washing facilities and preventing smoking and eating during such activities; • Stockpiling of contaminated soil should be avoided. If this cannot be avoided, the stockpile of contaminated materials should be segregated from the uncontaminated ones. Moreover, the contaminated materials should be properly covered with waterproof material (e.g. tarpaulin sheet) to avoid leaching of contaminants, especially during rainy season. • Vehicles containing any excavated materials should be suitably covered to limit potential dust emissions or contaminated wastewater run-off, and truck bodies and tailgates should be sealed to prevent any leakage during transport or during wet conditions; • Only licensed waste haulers should be used to collect and transport any contaminated material to an appropriate disposal site and procedures should be developed to ensure that illegal disposal of waste does not occur; • Necessary waste disposal permits should be obtained, as required, from the appropriate authorities, in accordance with the *Waste Disposal Ordinance (Cap 354)*, *Waste Disposal (Chemical Waste) (General) Regulation (Cap 35)*, as required; • Records of the quantities of wastes generated and disposed of should be maintained; • Adequate washing facilities should be provided on site; and • In accordance with good construction practice, silt traps should be used to reduce the impact to drainage caused by suspended solids arising from disturbed ground, or any construction materials such as cement and gravel. Groundwater should be disposed of in accordance with the *Water Pollution Control Ordinance (Cap 358)*.	Work site / During the construction period	All Contractors		√		Waste Disposal Ordinance (Cap 354), Waste Disposal (Chemical Waste) (General) Regulation (Cap 35); Water Pollution Control Ordinance (Cap 358).	Completed.
11.11.1		Based on preliminary site investigation, the site is considered as a potentially land contaminated site as hotspots of contamination of lead and sulphur were identified. Further investigation for land contamination at this site is therefore required and is detailed in the Contamination Assessment Plan (CAP) of this section to be undertaken prior to commencement of excavation works. A Contamination Assessment Report (CAR) should be prepared and if the results of the site investigation reveal contamination at the subject site, a Remediation Action Plan (RAP) should also be prepared and submitted together with the CAR to EPD for approval.	Work site / During the construction period	All Contractors		√		Waste Disposal Ordinance (Cap 354), Waste Disposal (Chemical Waste) (General) Regulation (Cap 35); Water Pollution Control Ordinance (Cap 358).	Same as above.

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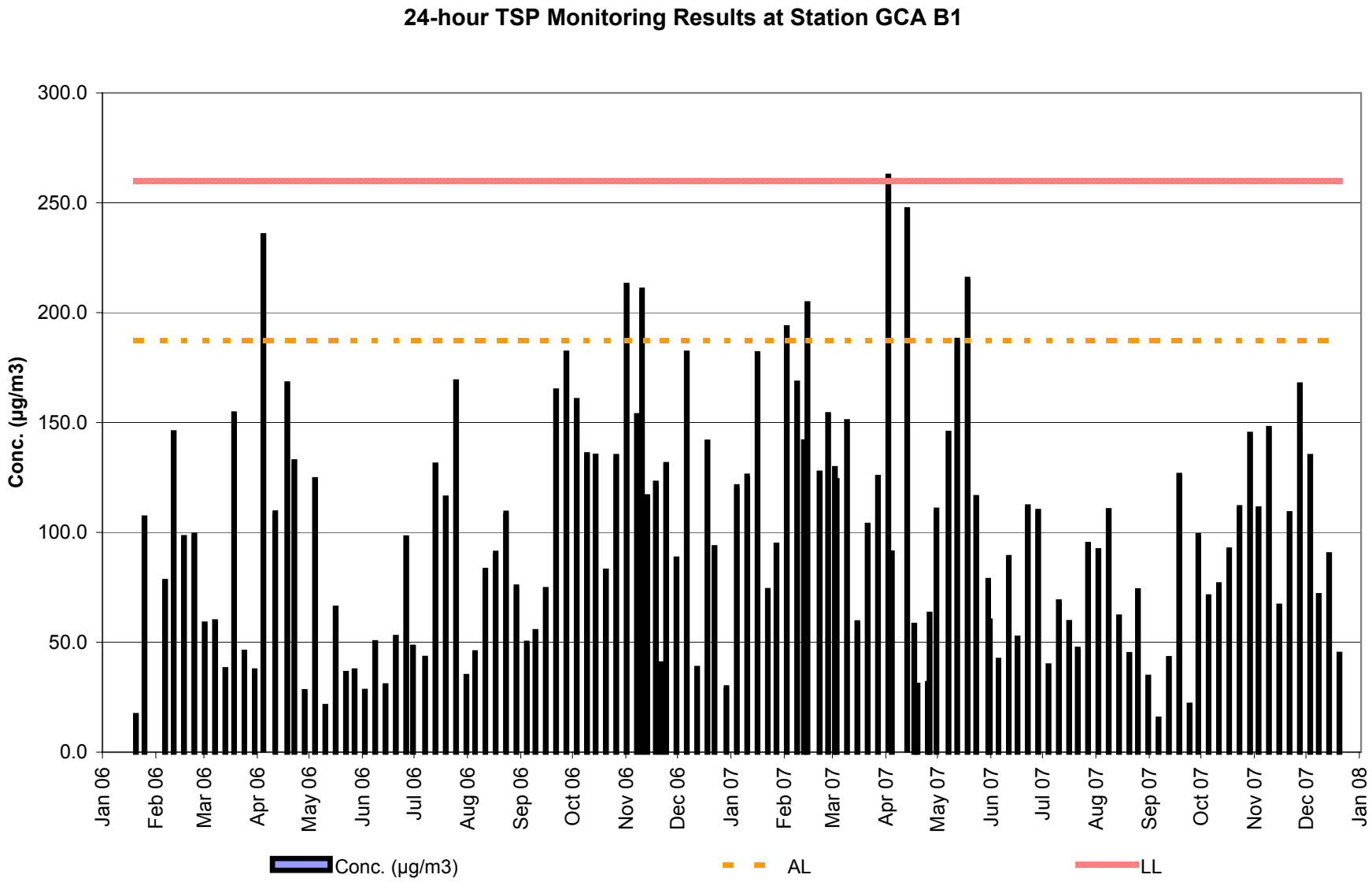
** D=Design, C=Construction, O=Operation; N/A Not applicable

Annex E
Summary of Monitoring Results

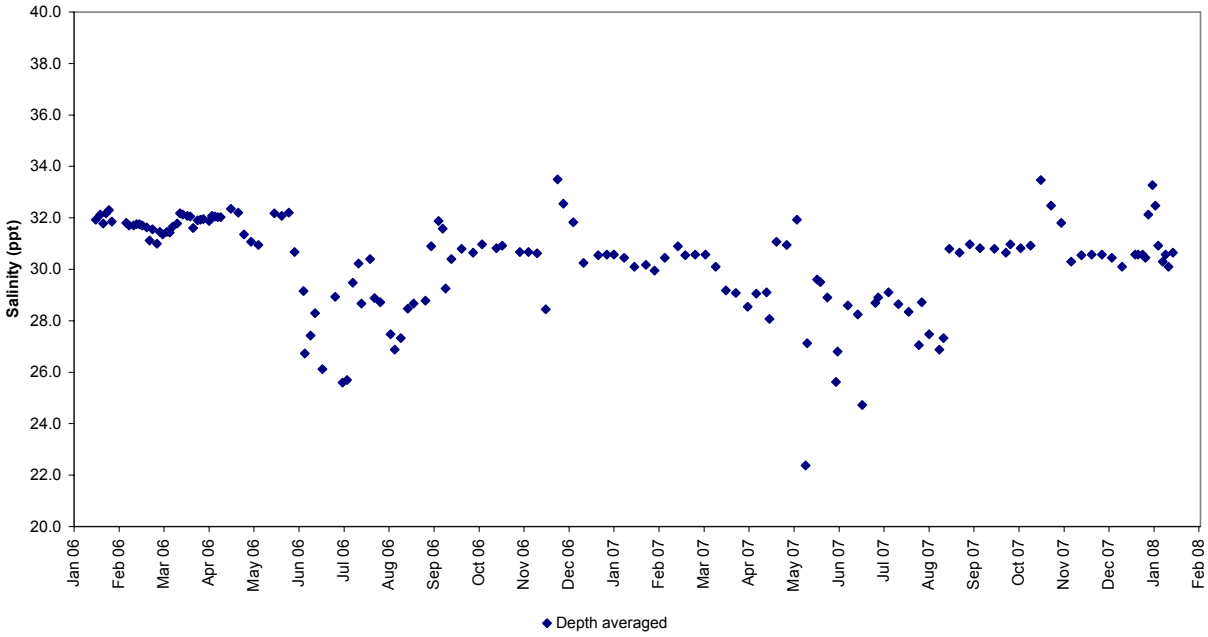
Air Quality


24-hour TSP Monitoring Results at Station GCA B1
Conc. (µg/m3)
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Jan 06
Feb 06
Mar 06
Apr 06
May 06
Jun 06
Jul 06
Aug 06
Sep 06
Oct 06
Nov 06
Dec 06
Jan 07
Feb 07
Mar 07
Apr 07
May 07
Jun 07
Jul 07
Aug 07
Sep 07
Oct 07
Nov 07
Dec 07
Jan 08
Conc. (µg/m3)
AL
LL

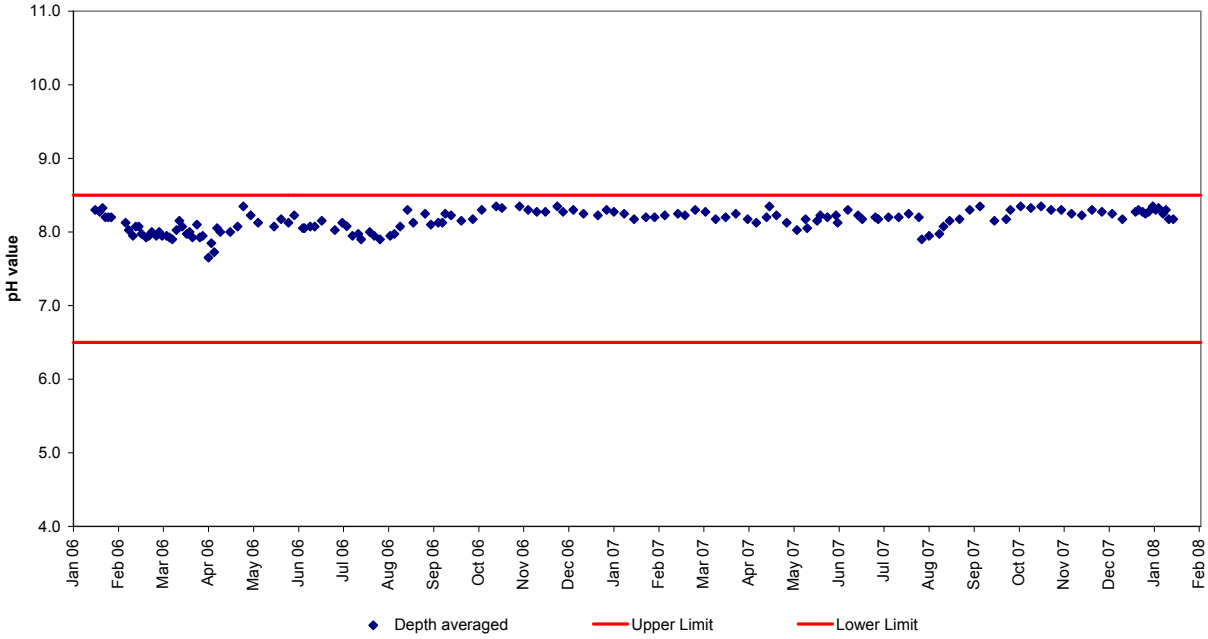
AQ Figure

Water Quality

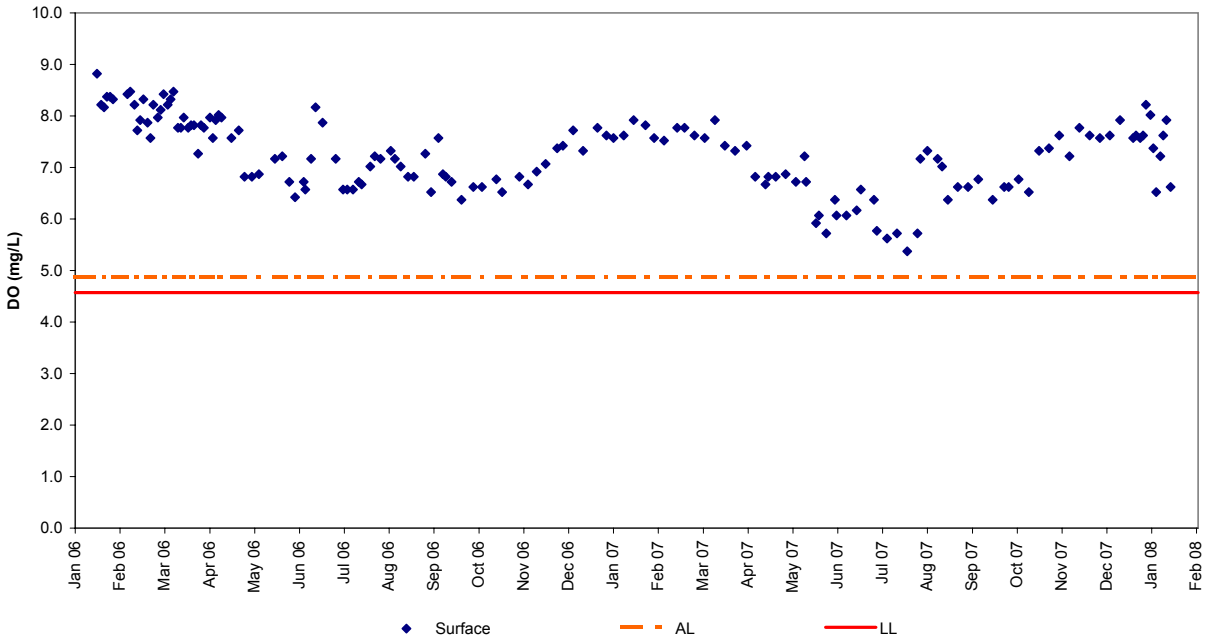
M_RO1 : Salinity



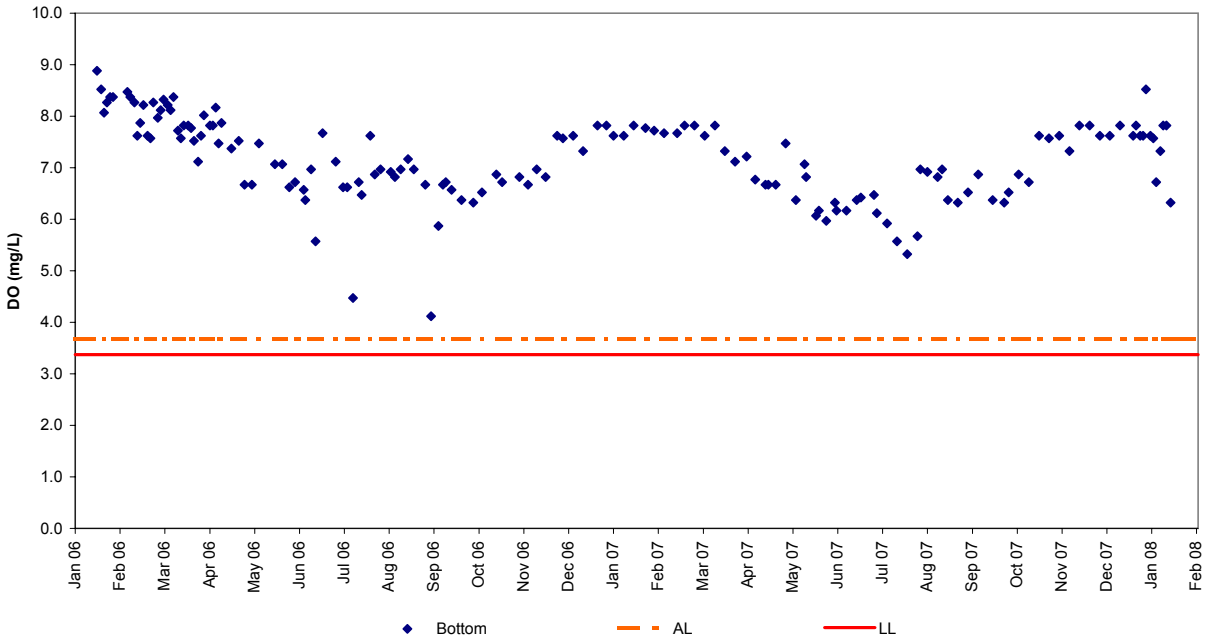
M_RO1 : pH



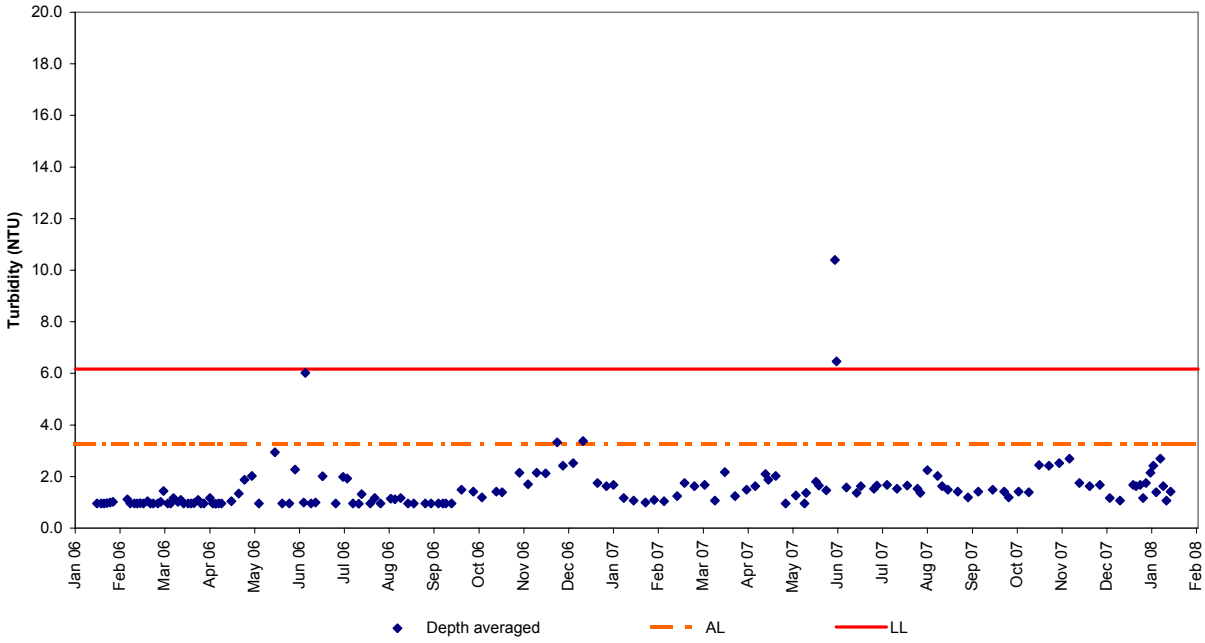
M_RO1 : Dissolved Oxygen (Surface)



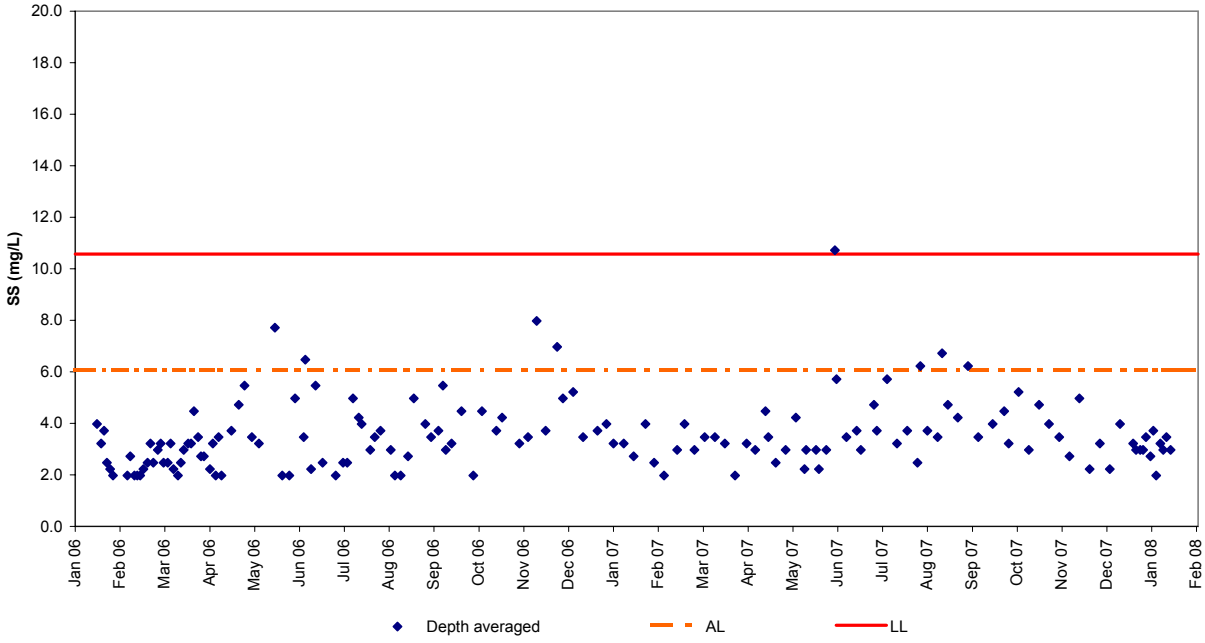
M_RO1 : Dissolved Oxygen (Bottom)



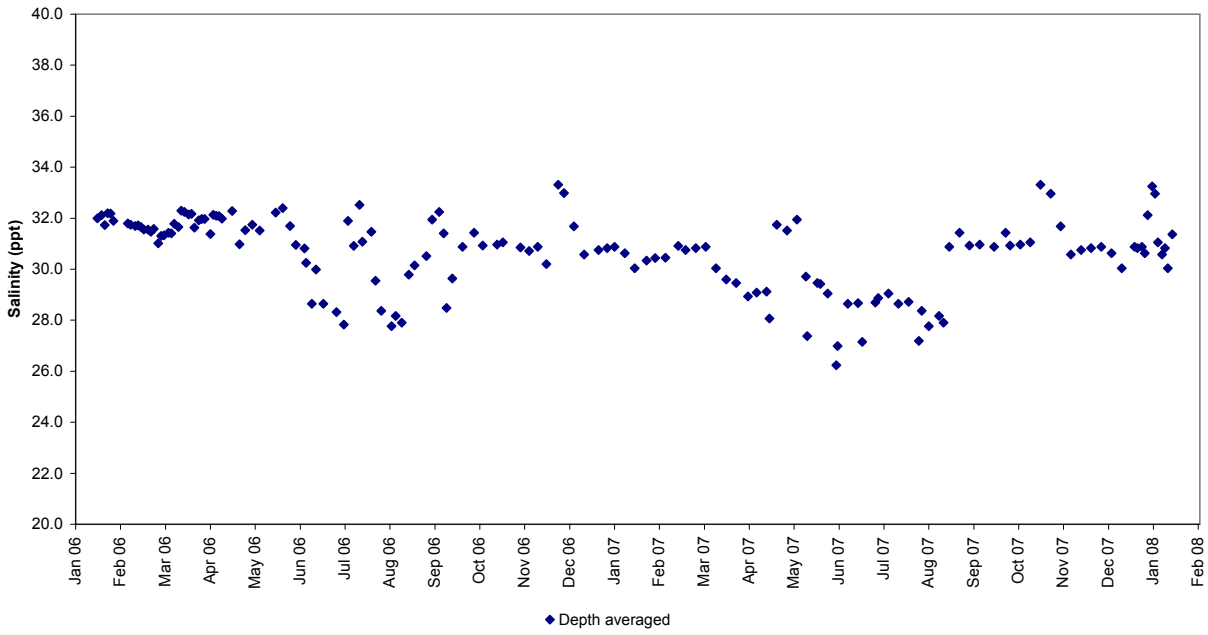
M_RO1 : Turbidity



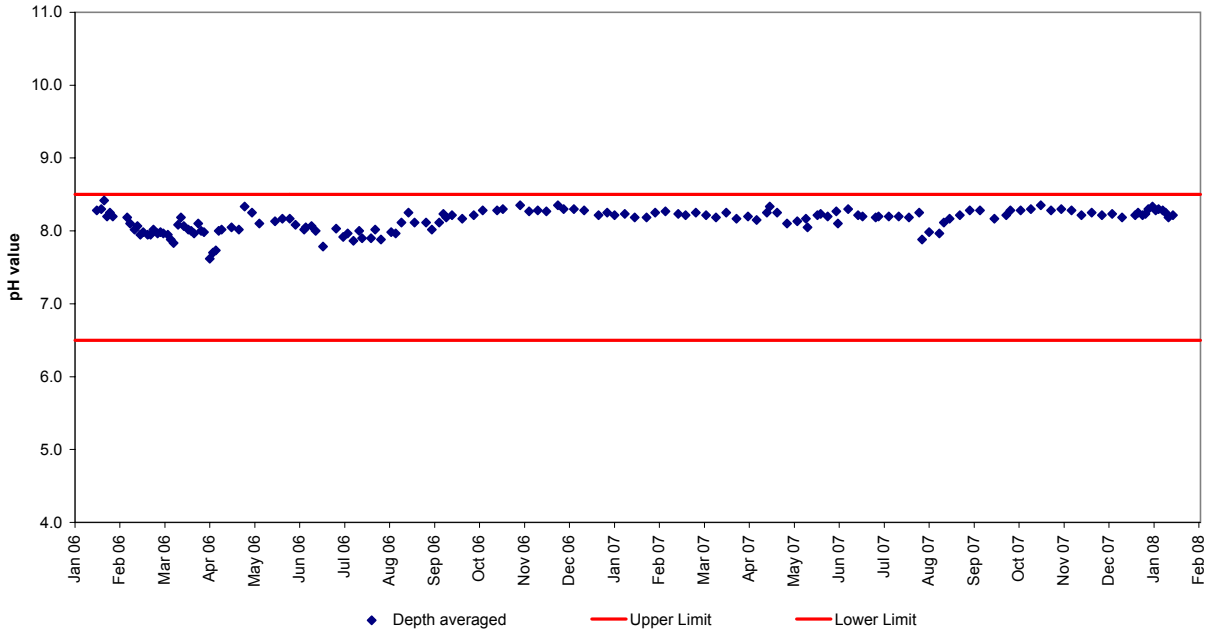
M_RO1 : Suspended Solids



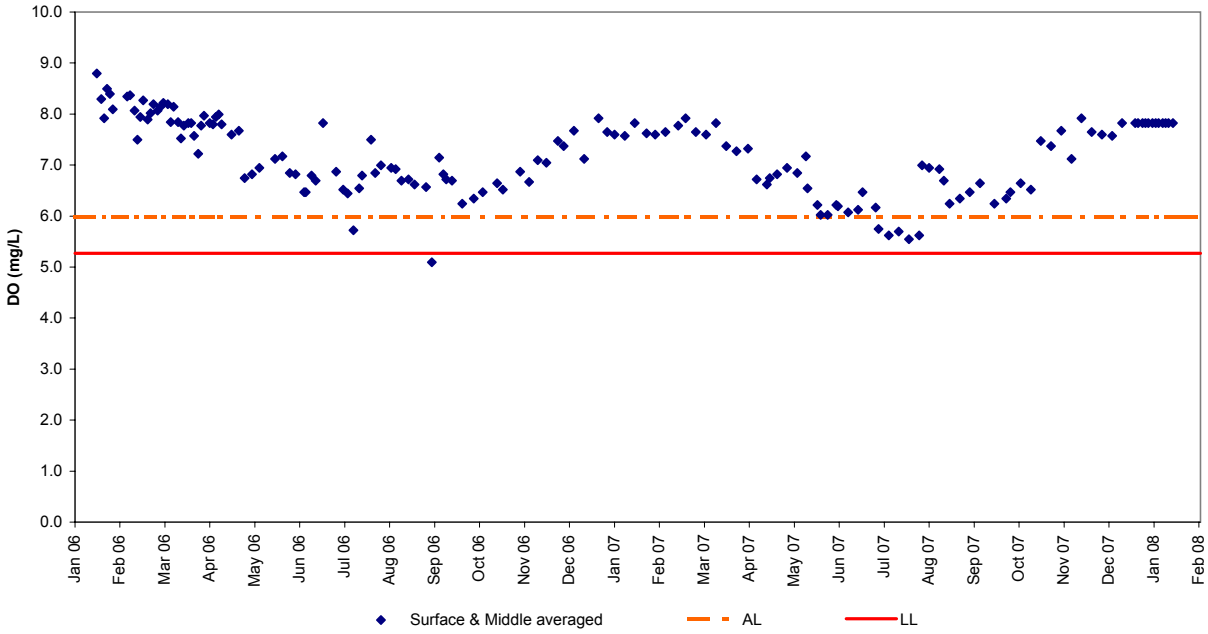
KLW : Salinity



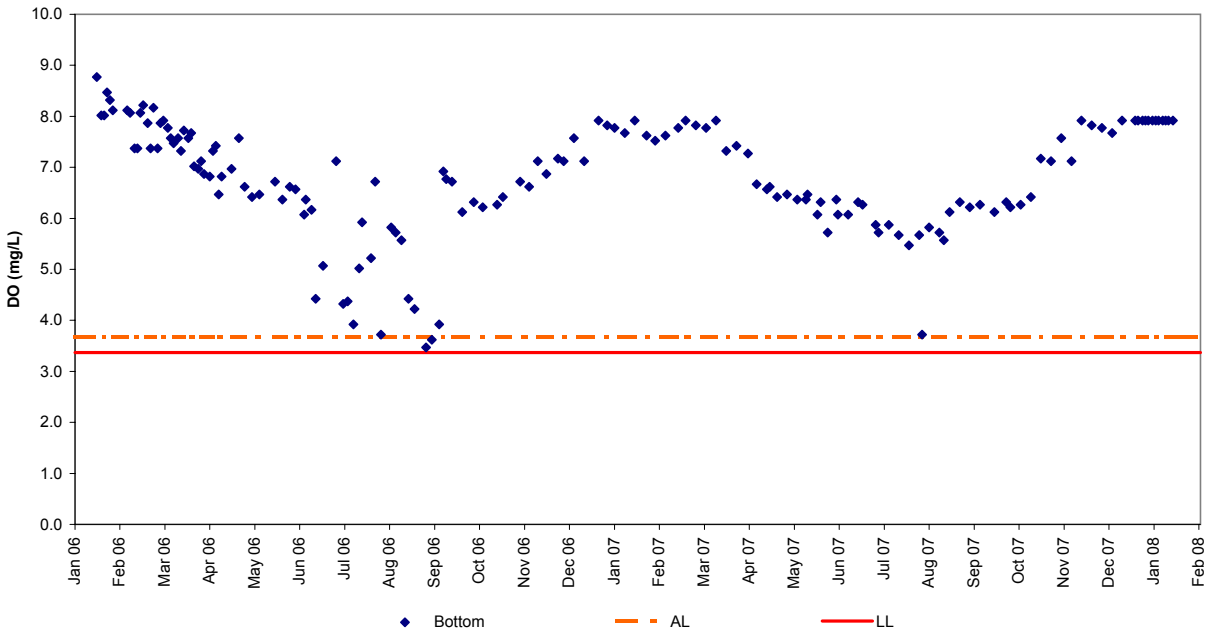
KLW : pH



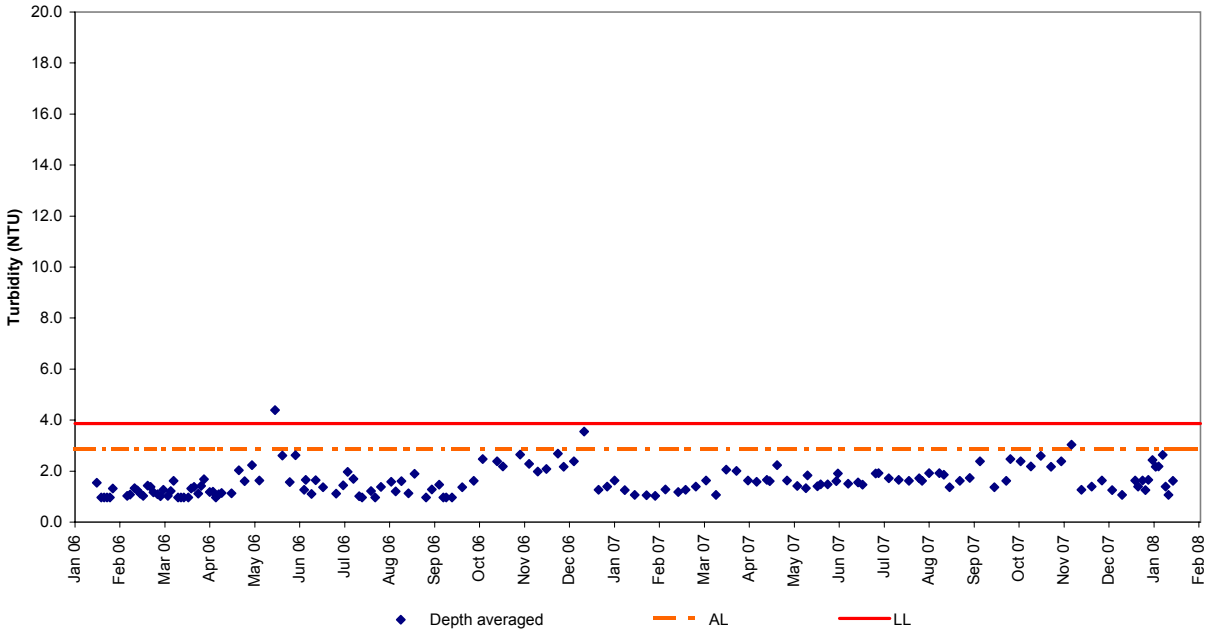
KLW : Dissolved Oxygen (Surface & Middle)



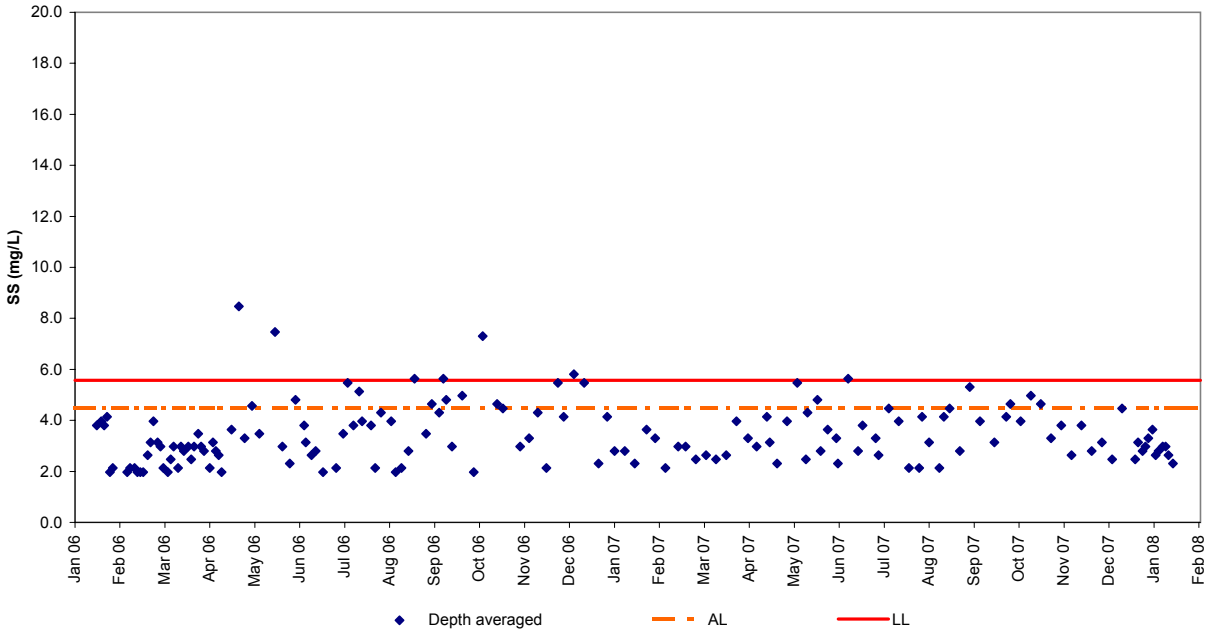
KLW : Dissolved Oxygen (Bottom)



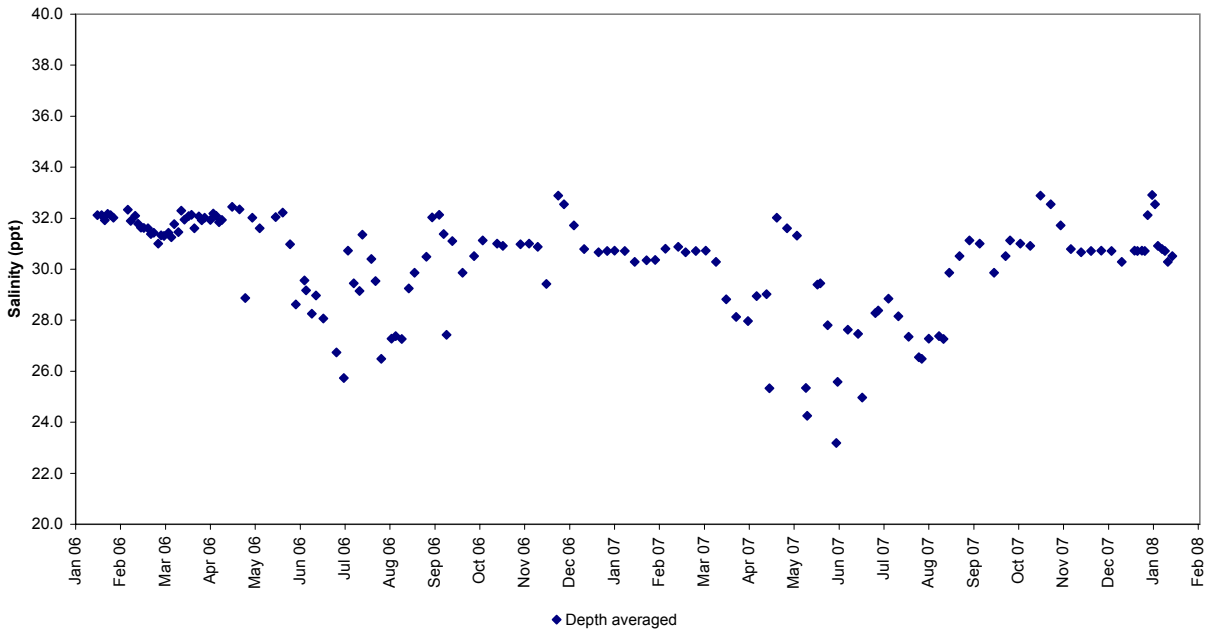
KLW : Turbidity



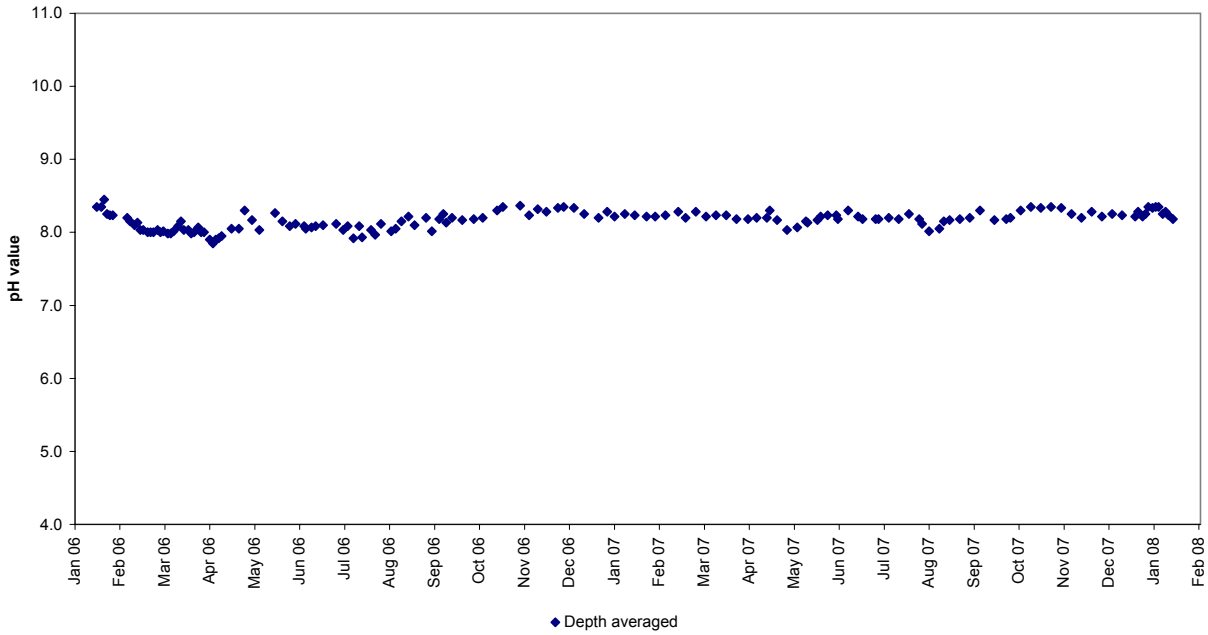
KLW : Suspended Solids



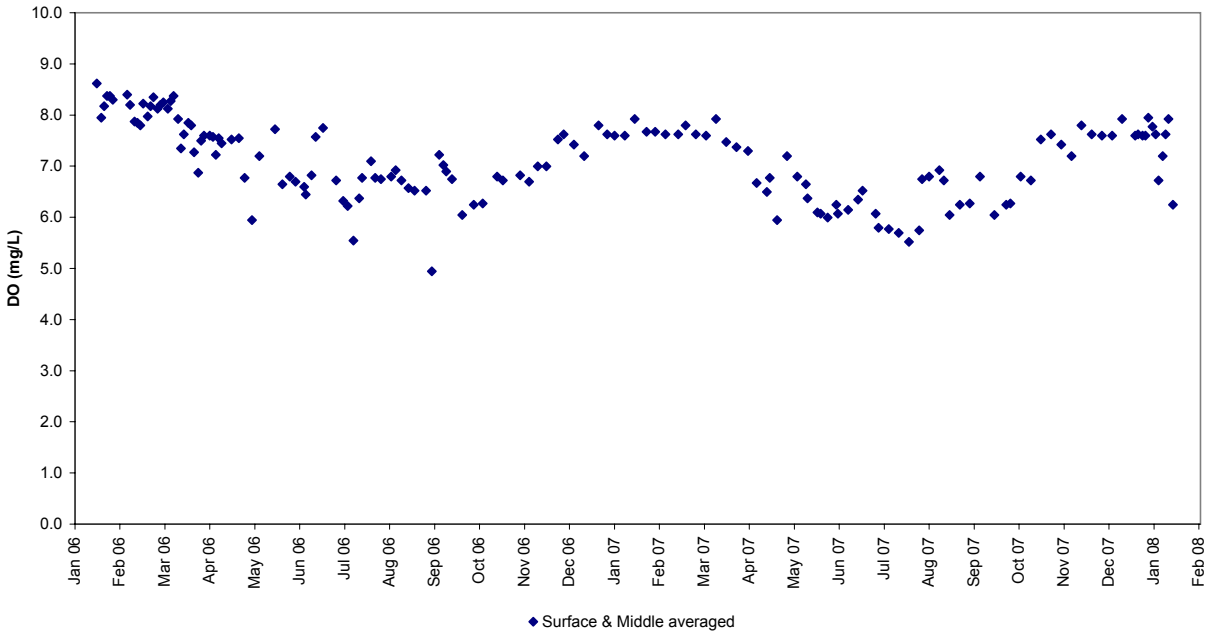
M_A : Salinity



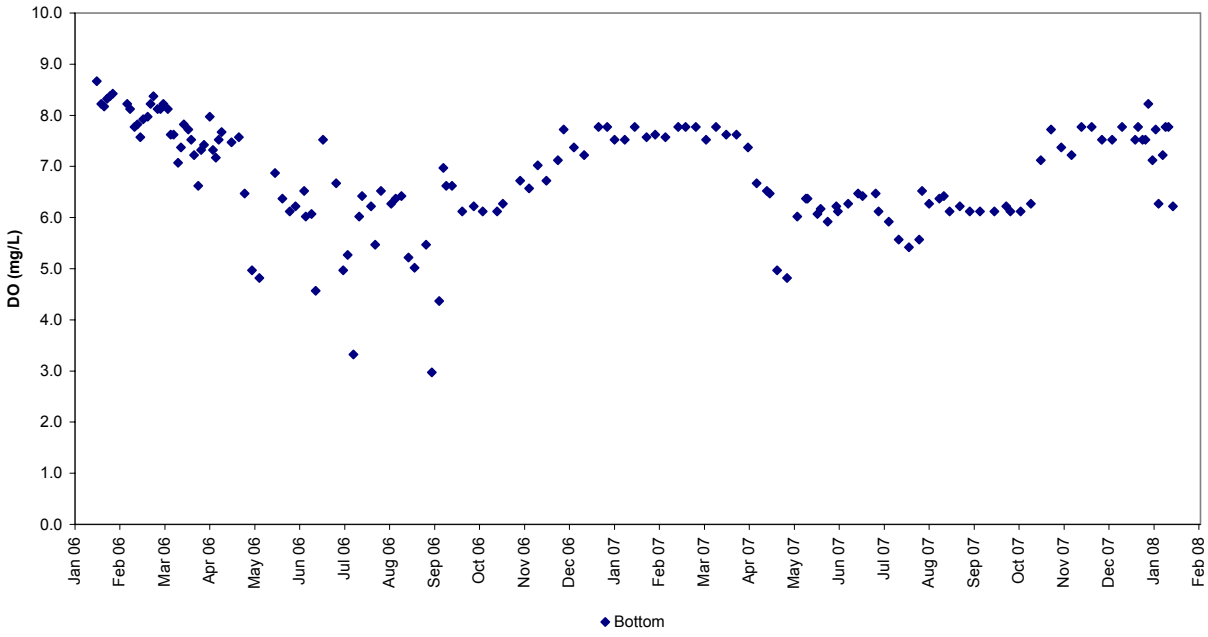
M_A : pH

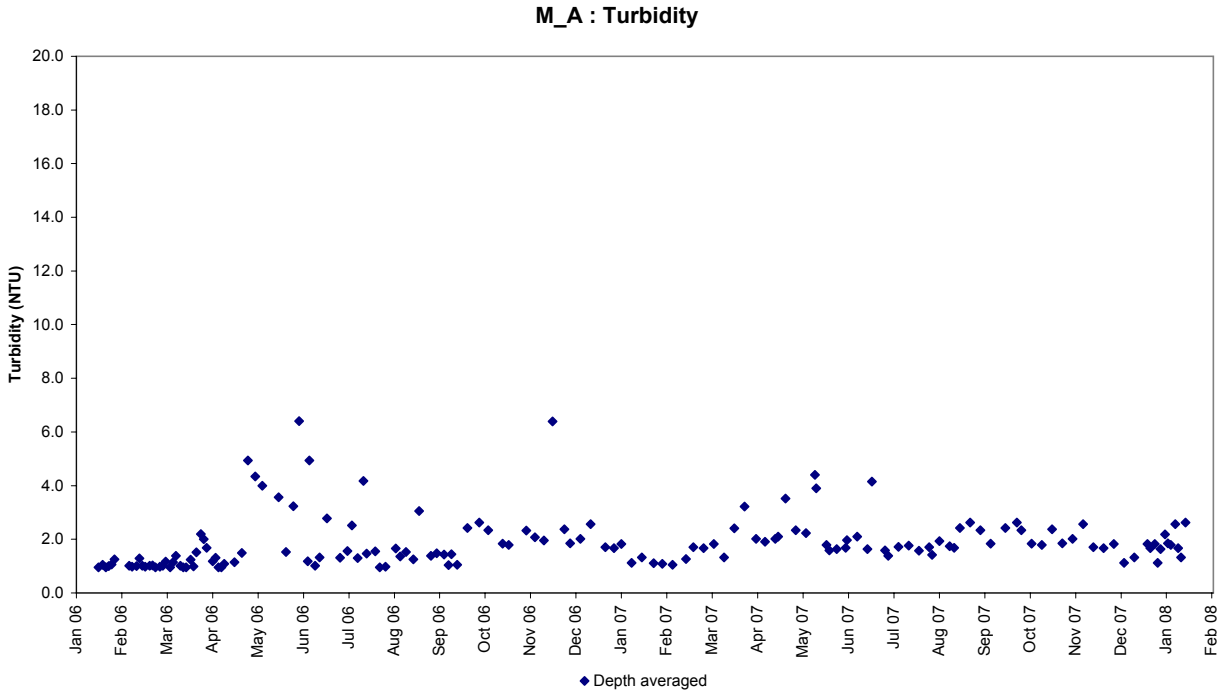


M_A : Dissolved Oxygen (Surface & Middle)



M_A : Dissolved Oxygen (Bottom)




M_A : Turbidity
Turbidity (NTU)
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jan 06
Feb 06
Mar 06
Apr 06
May 06
Jun 06
Jul 06
Aug 06
Sep 06
Oct 06
Nov 06
Dec 06
Jan 07
Feb 07
Mar 07
Apr 07
May 07
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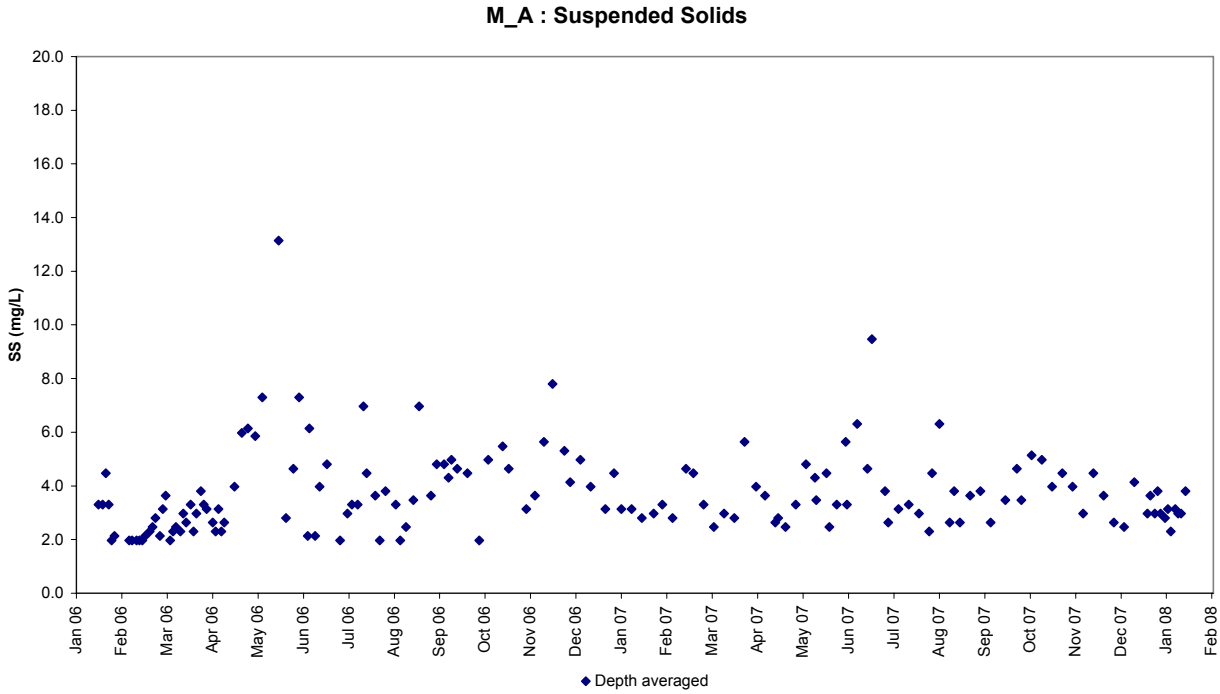
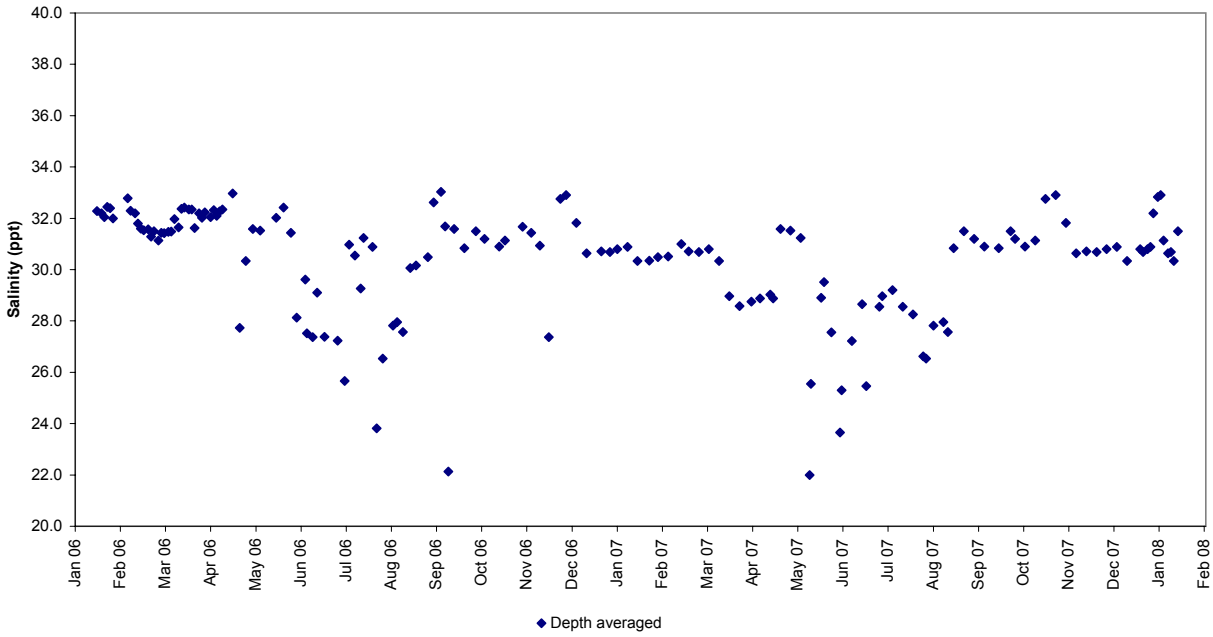
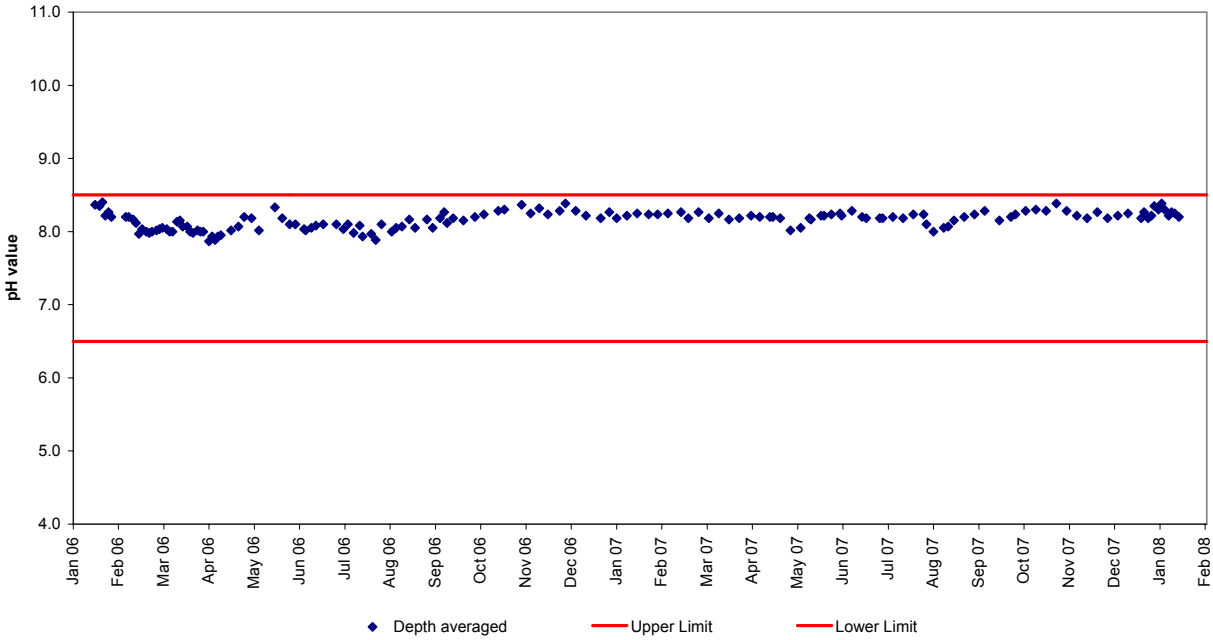
Jul 07
Aug 07
Sep 07
Oct 07
Nov 07
Dec 07
Jan 08
Feb 08
Depth averaged


M_A : Suspended Solids
SS (mg/L)
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jan 06
Feb 06
Mar 06
Apr 06
May 06
Jun 06
Jul 06
Aug 06
Sep 06
Oct 06
Nov 06
Dec 06
Jan 07
Feb 07
Mar 07
Apr 07
May 07
Jun 07
Jul 07
Aug 07
Sep 07
Oct 07
Nov 07
Dec 07
Jan 08
Feb 08
Depth averaged

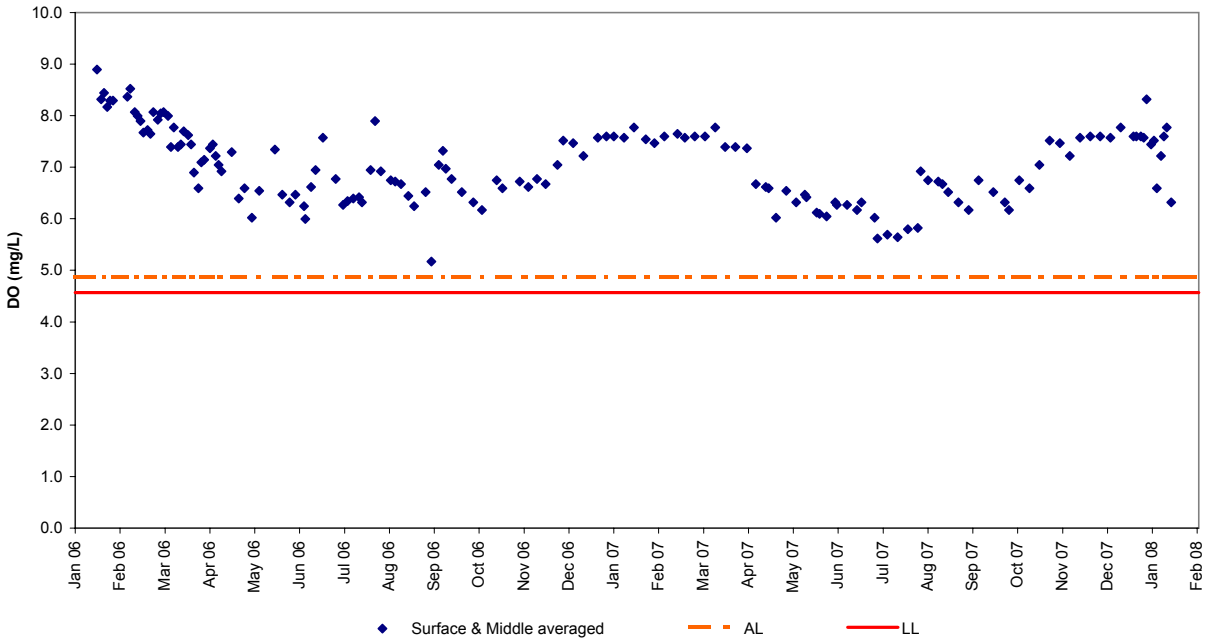
M_Marsh : Salinity



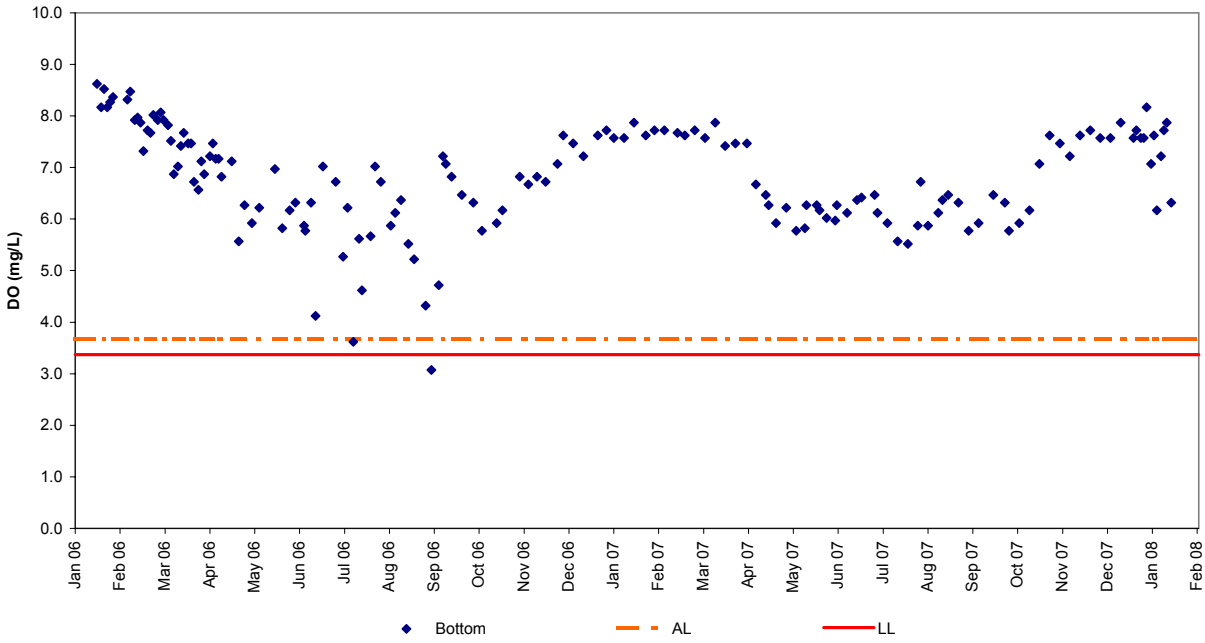
M_Marsh : pH



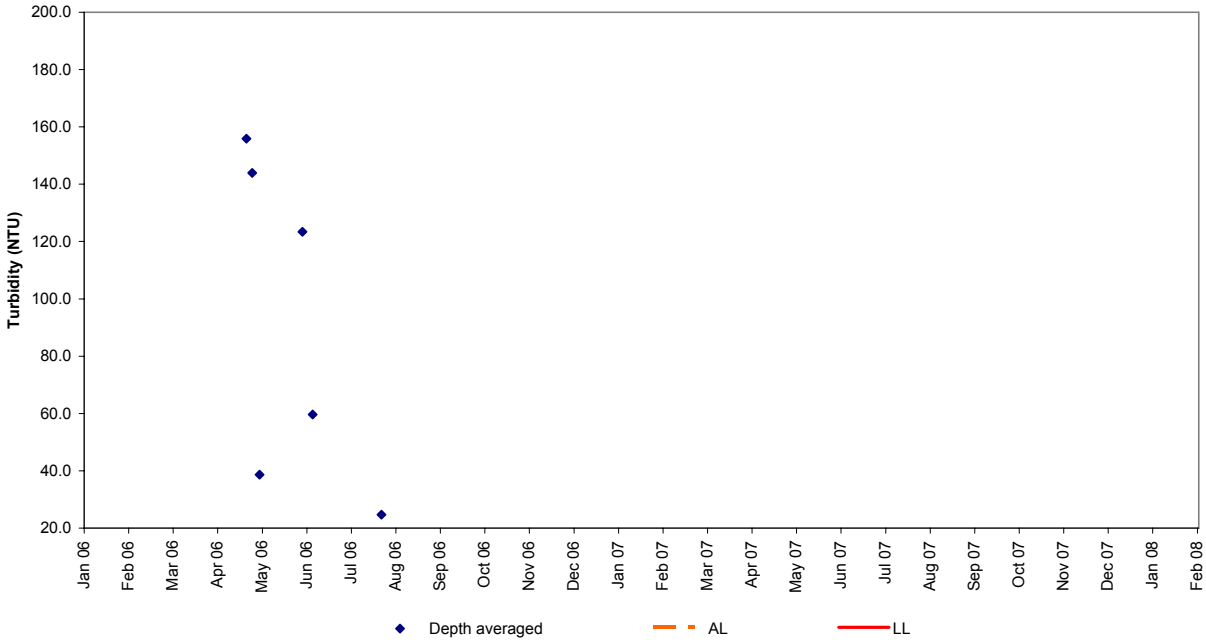
M_Marsh : Dissolved Oxygen (Surface & Middle)



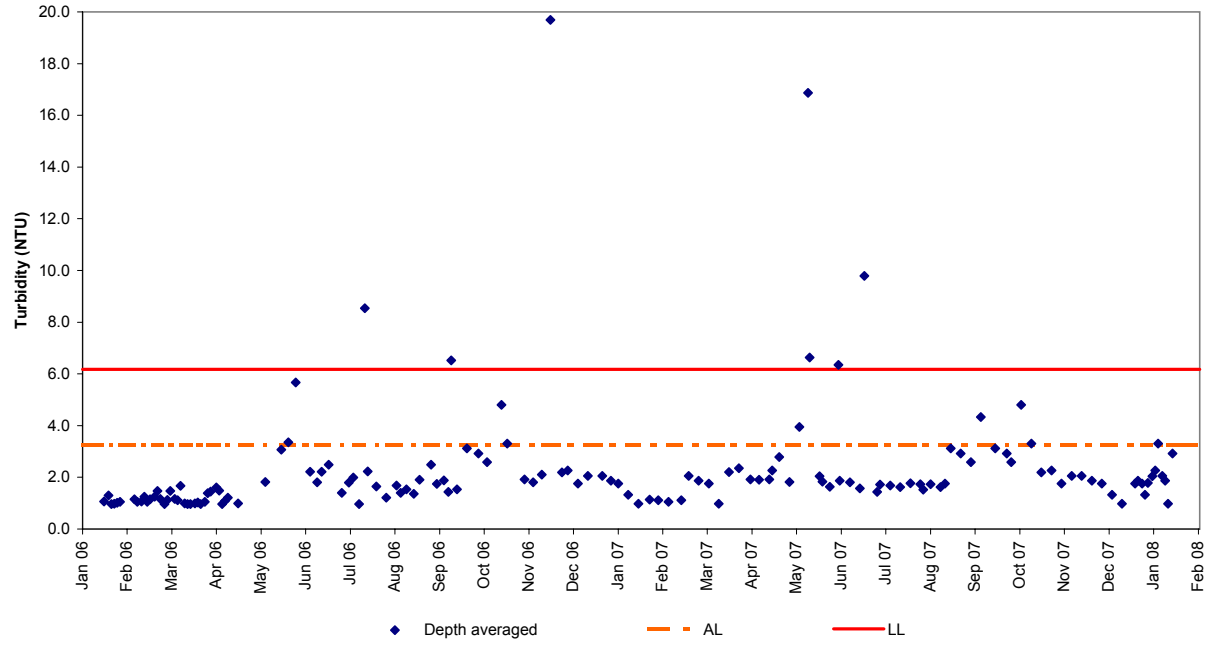
M_Marsh : Dissolved Oxygen (Bottom)



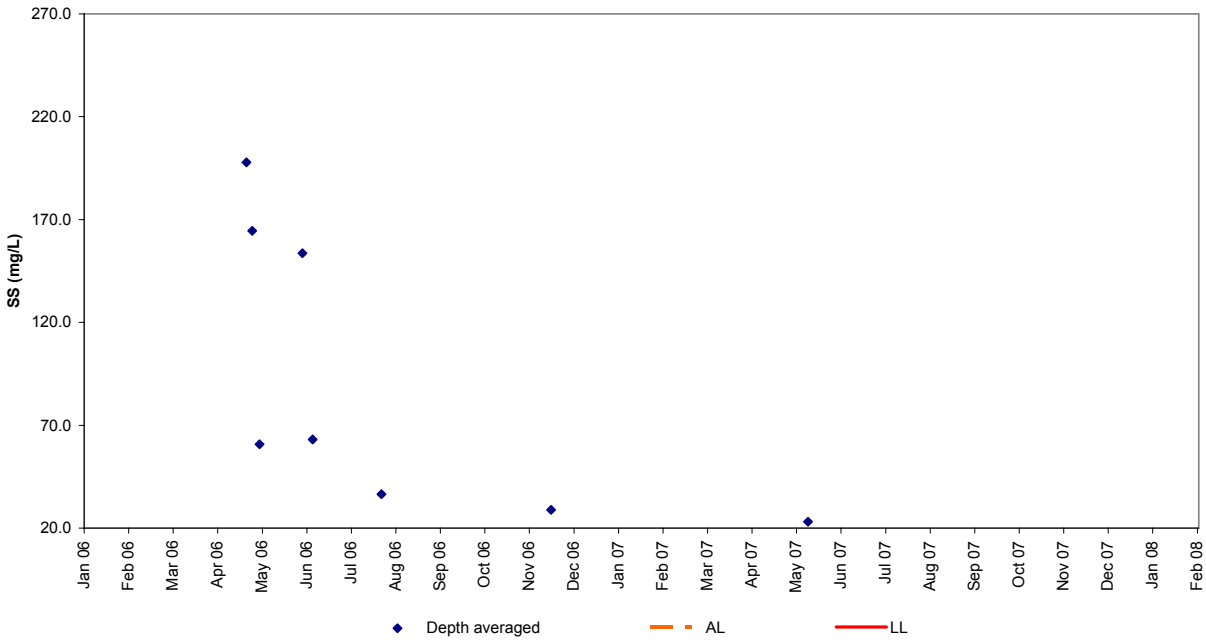
M_Marsh : Turbidity (Large in Scale)



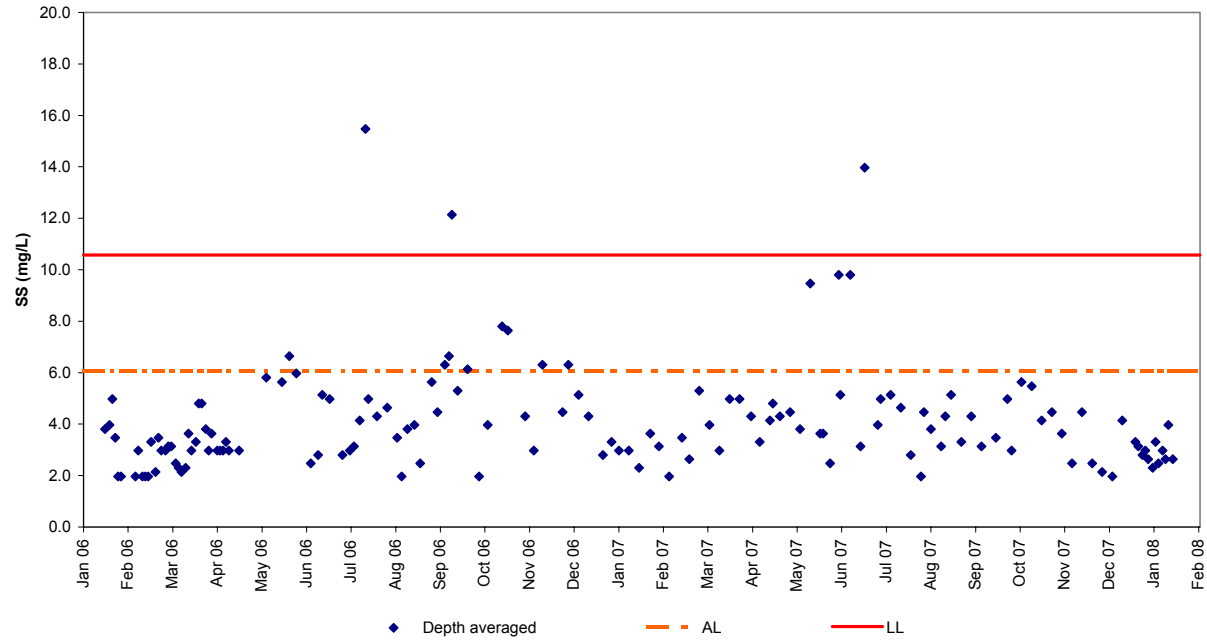
M_Marsh : Turbidity (Normal in Scale)



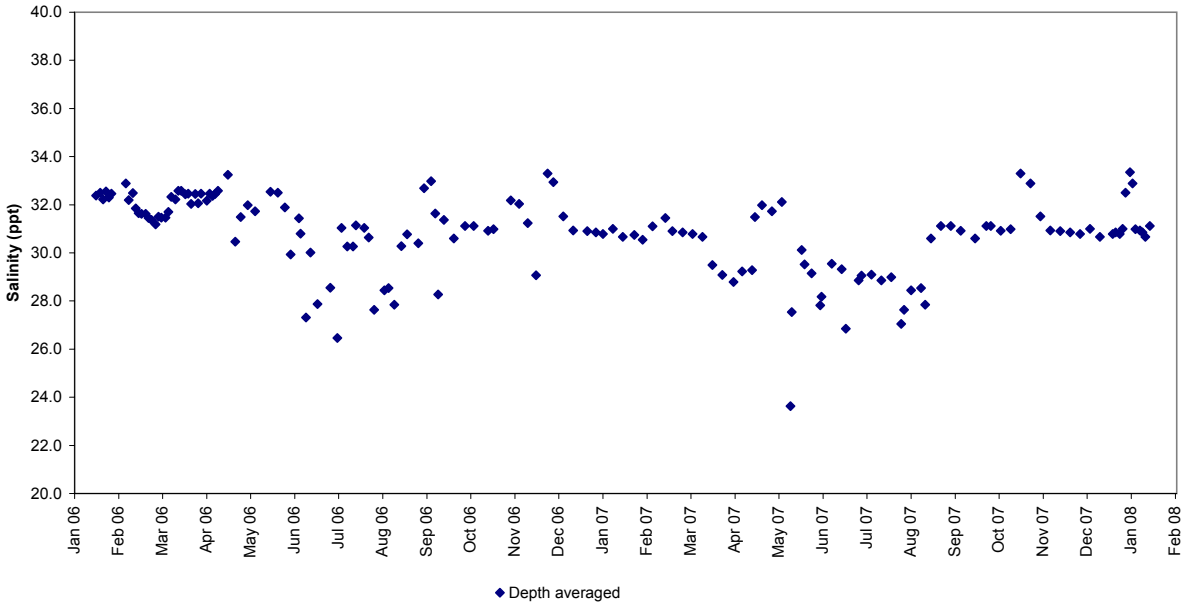
M_Marsh : Suspended Solids (Large in Scale)



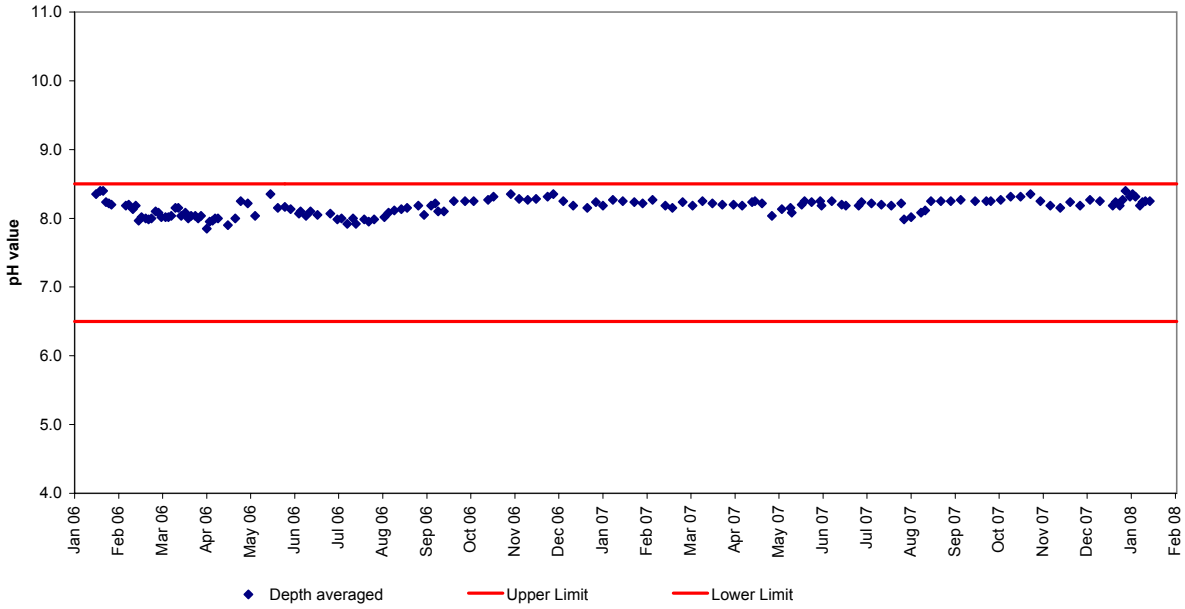
M_Marsh : Suspended Solids (Normal in Scale)



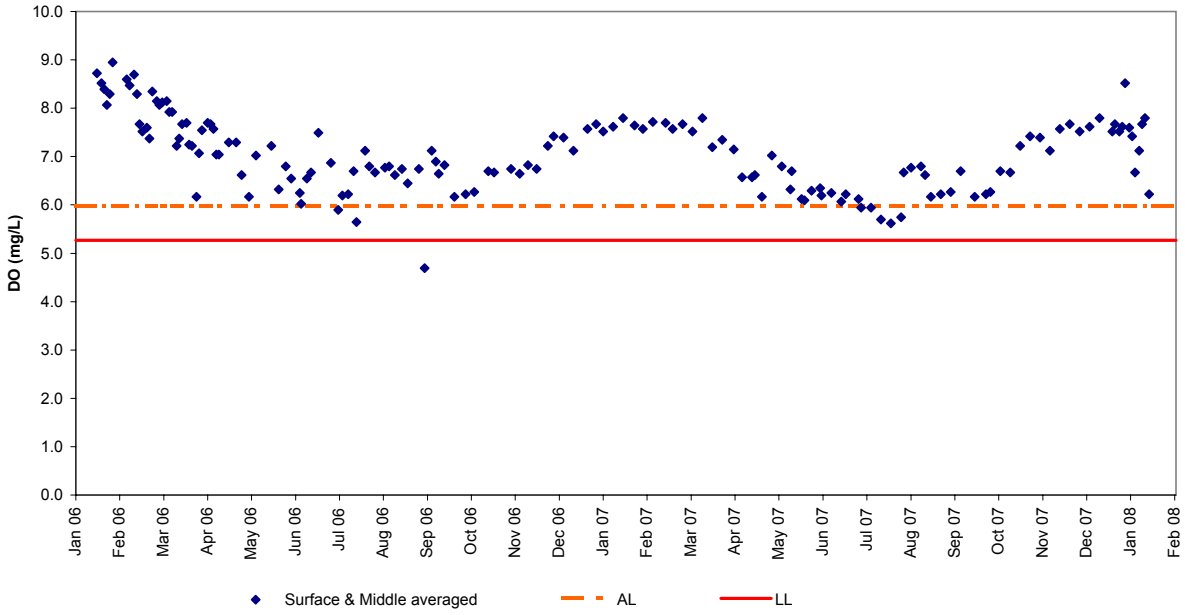
TTC : Salinity



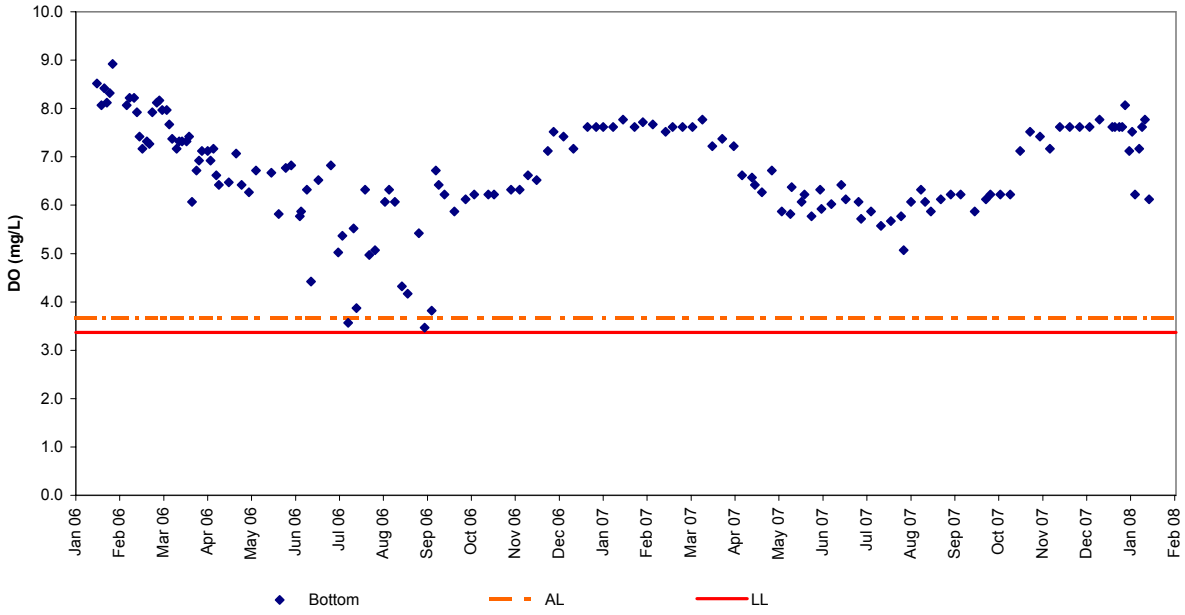
TTC : pH



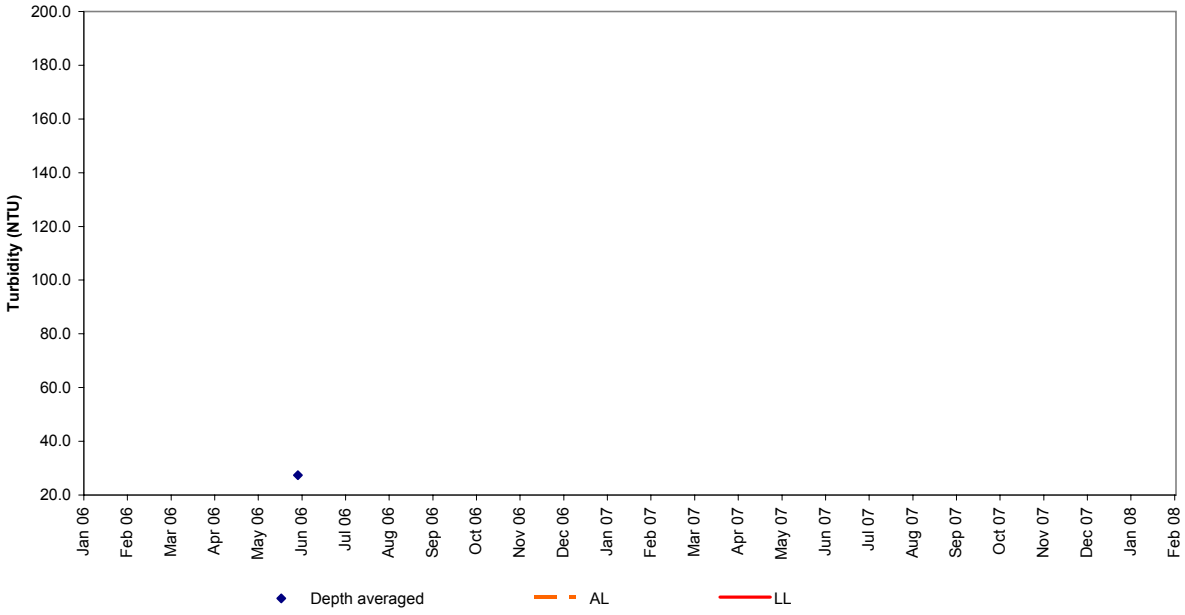
TTC : Dissolved Oxygen (Surface & Middle)



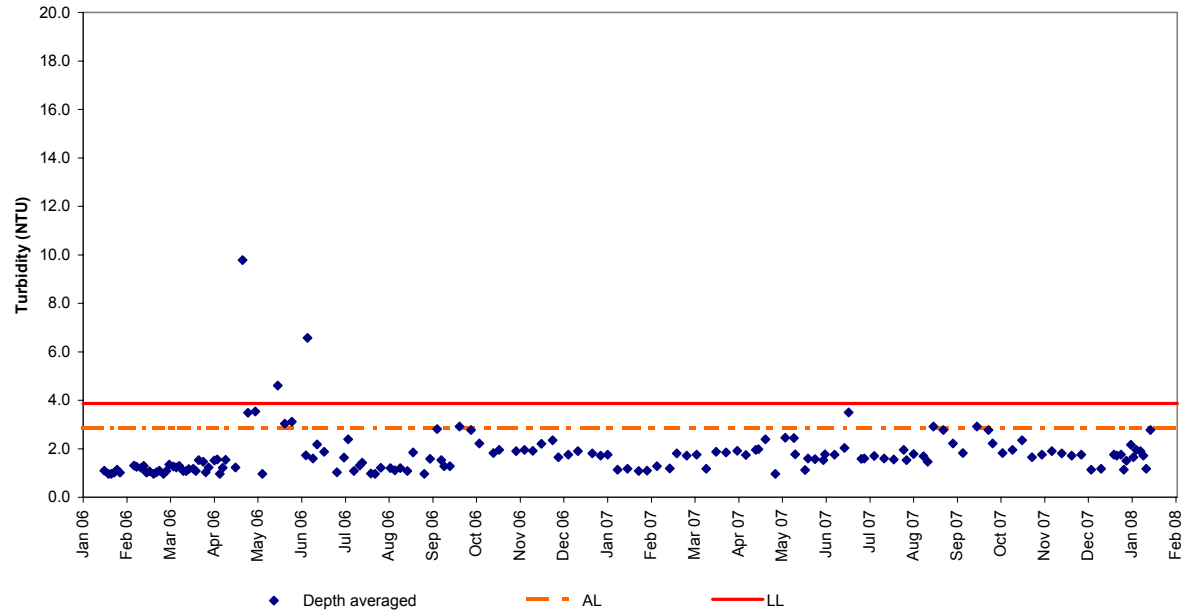
TTC : Dissolved Oxygen (Bottom)



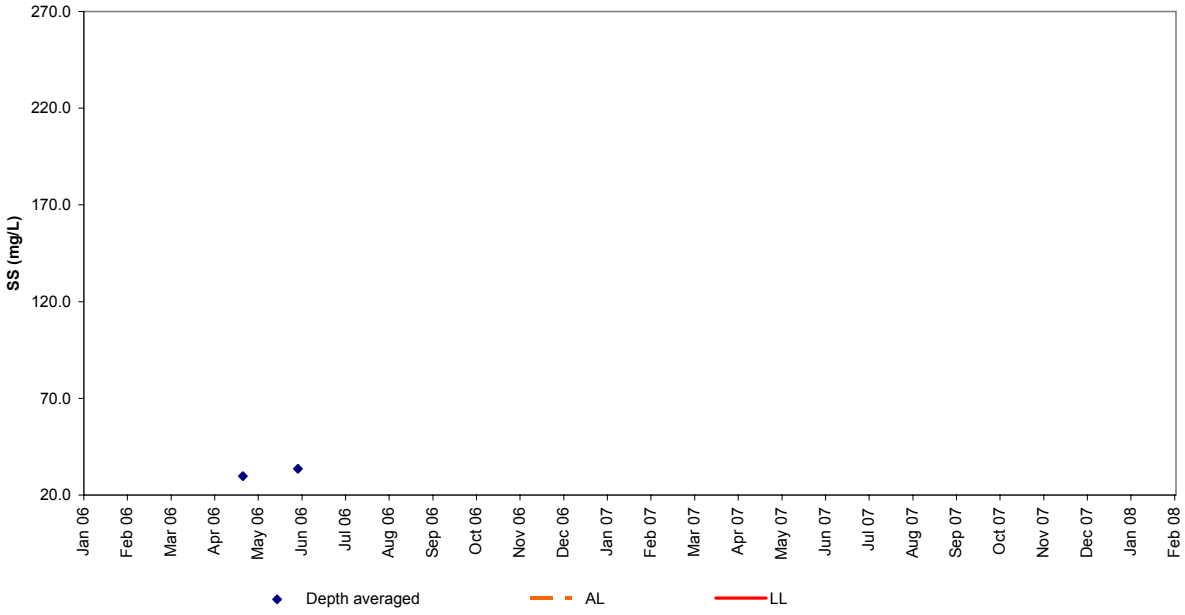
TTC : Turbidity (Large in Scale)



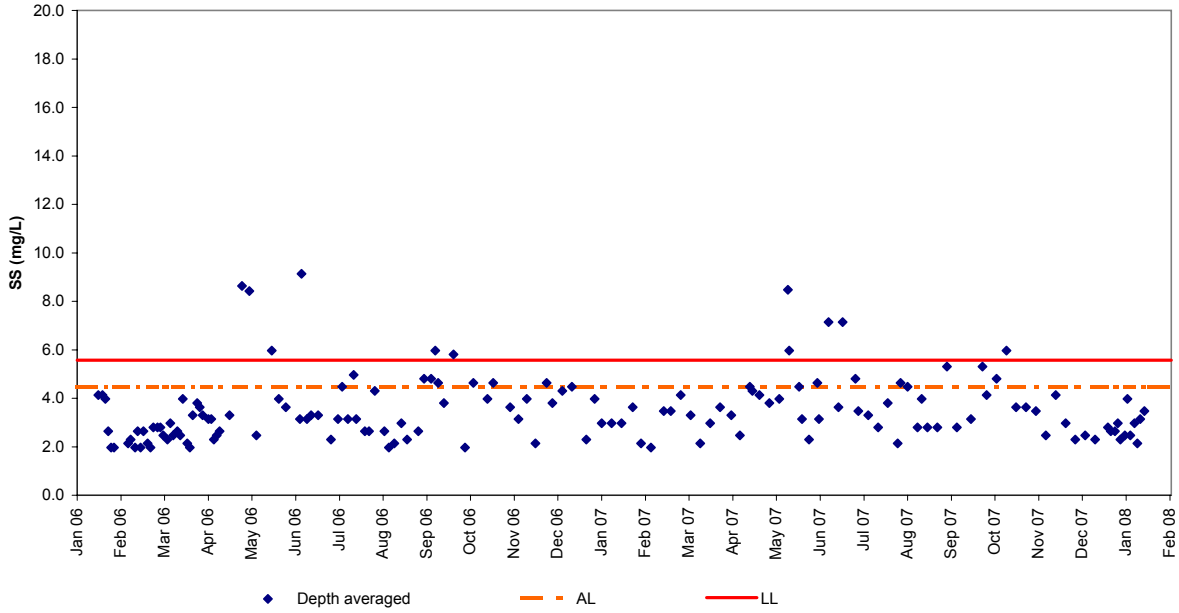
TTC : Turbidity (Normal in Scale)



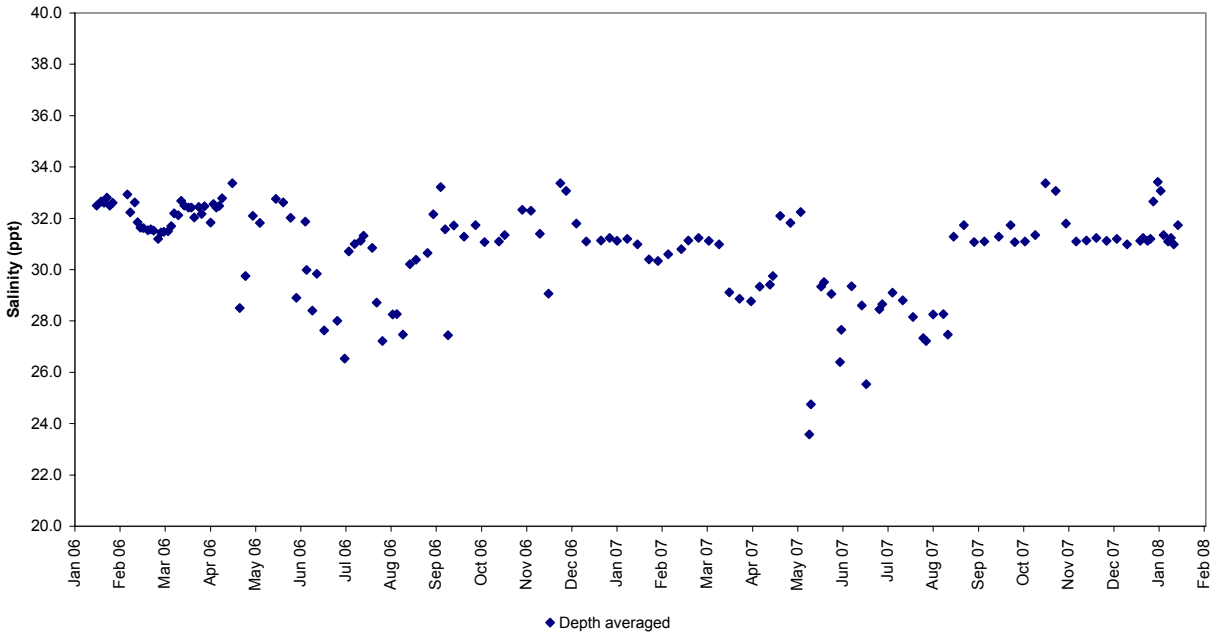
TTC : Suspended Solids (Large in Scale)



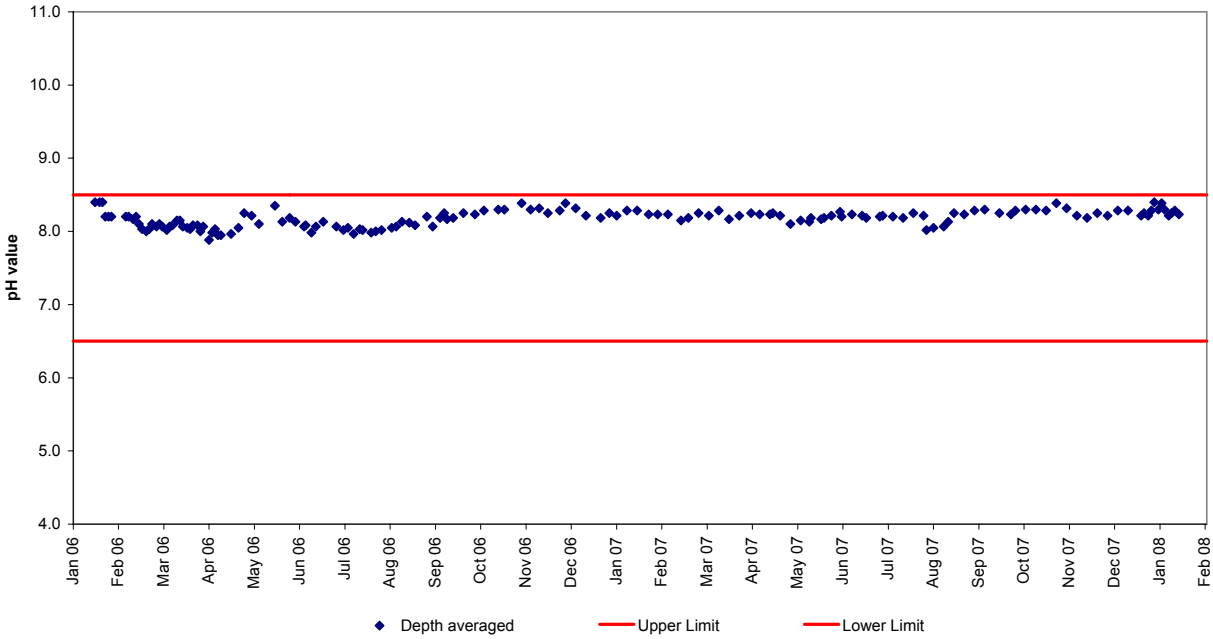
TTC : Suspended Solids (Normal in Scale)



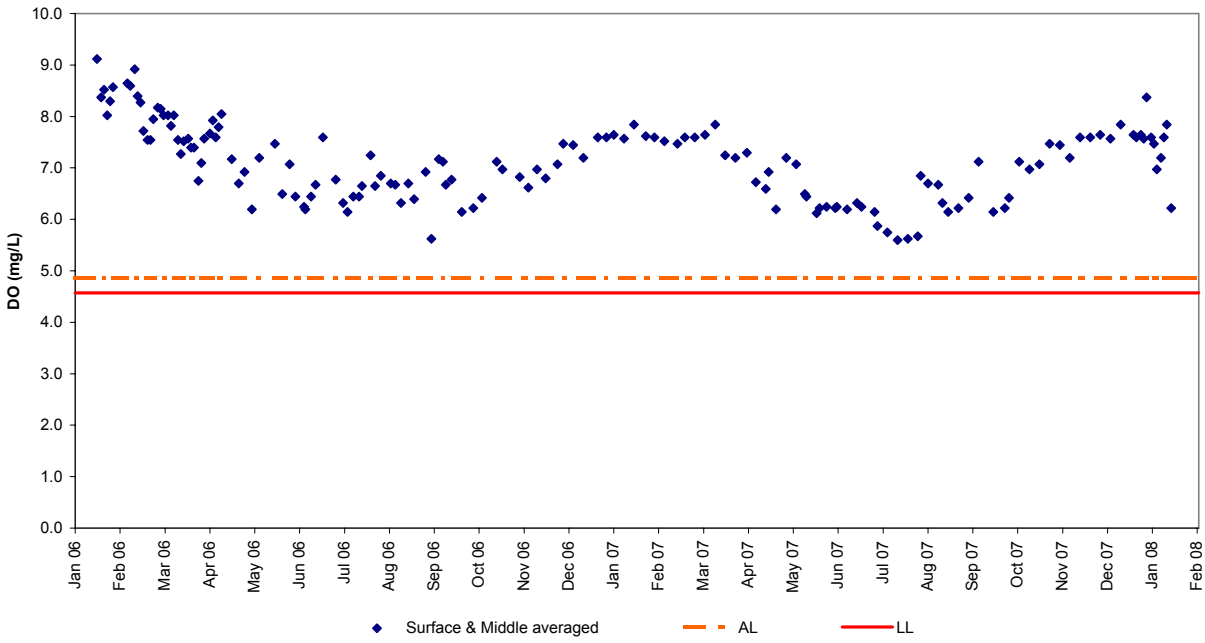
M_BP : Salinity



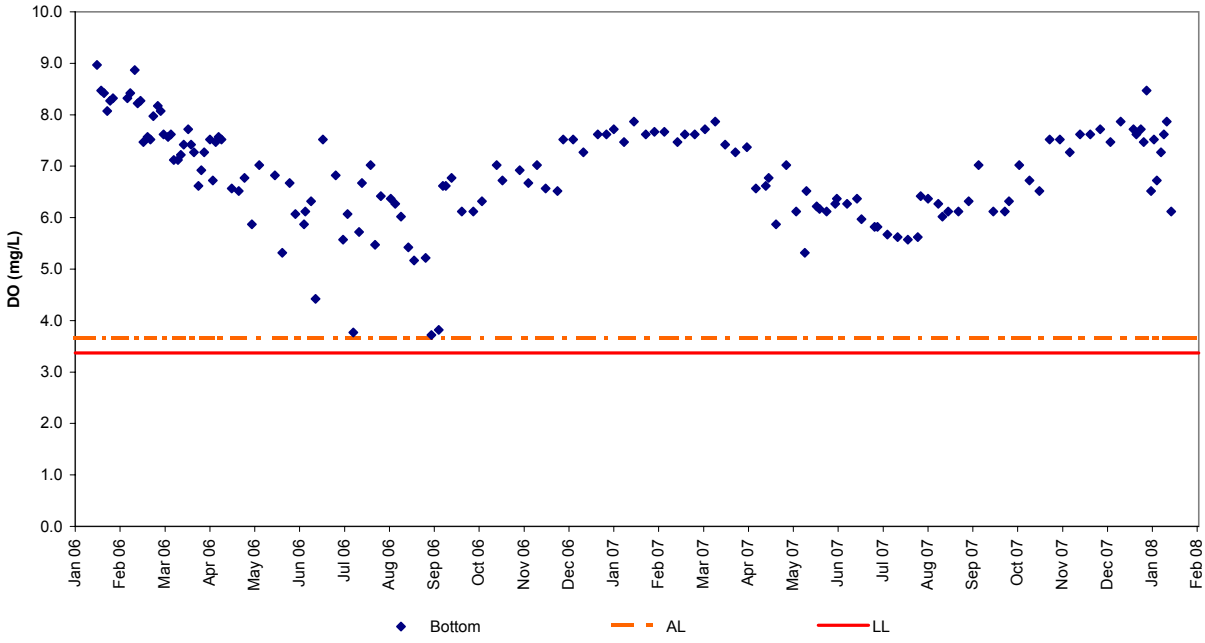
M_BP : pH



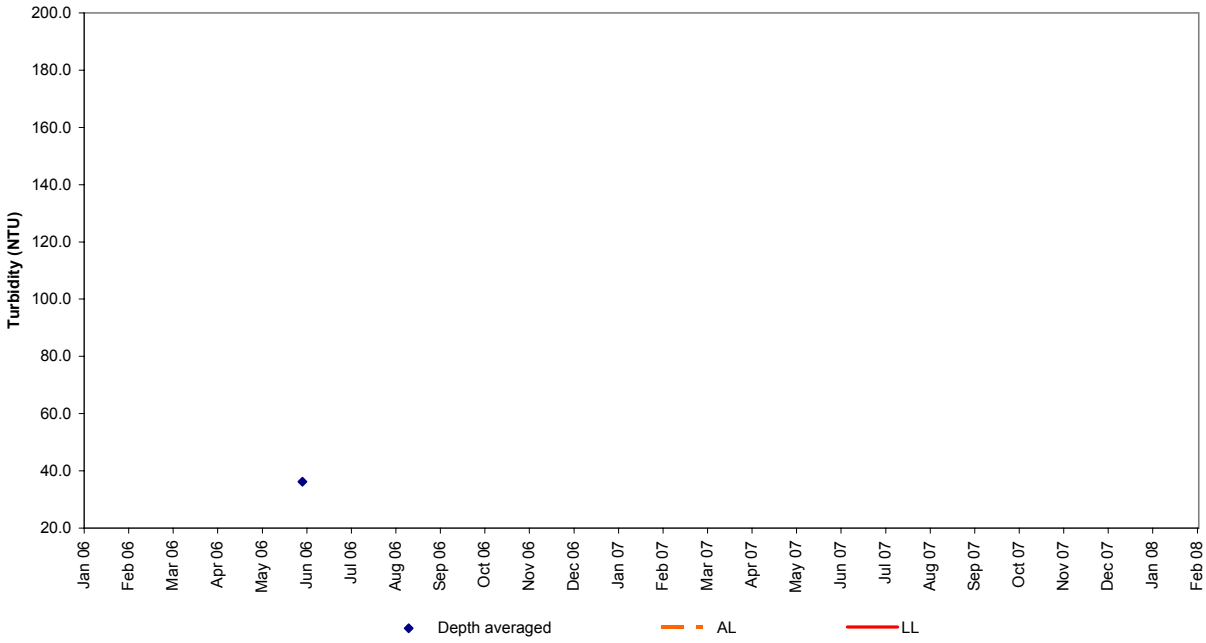
M_BP : Dissolved Oxygen (Surface & Middle)



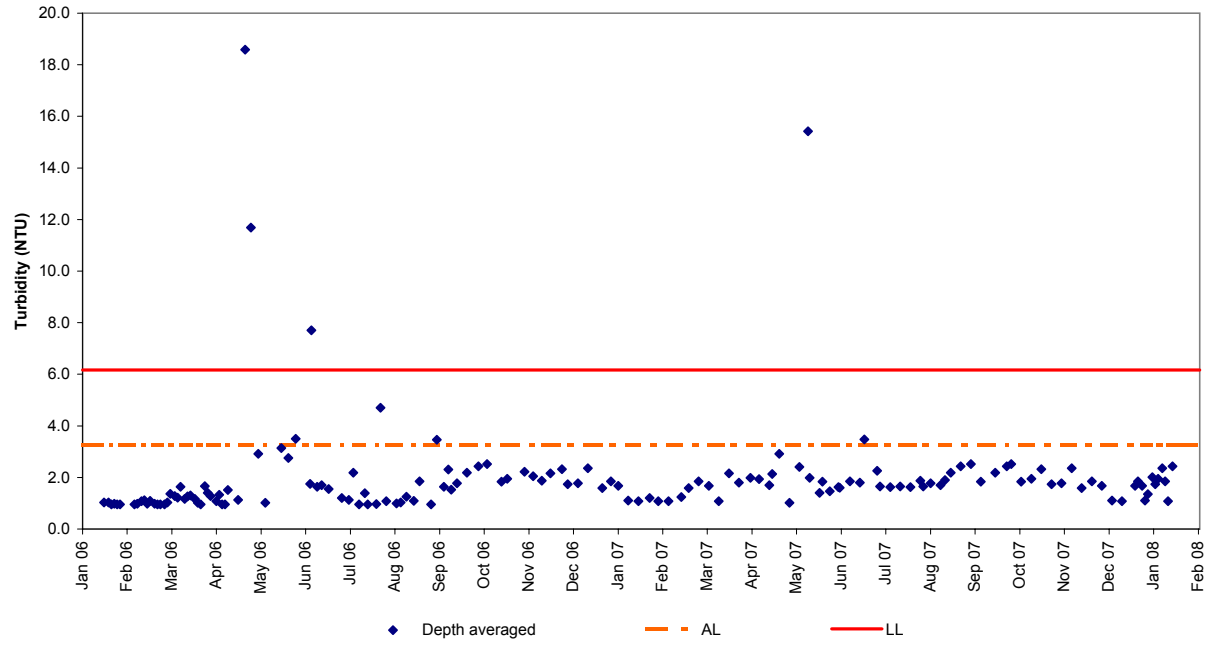
M_BP : Dissolved Oxygen (Bottom)



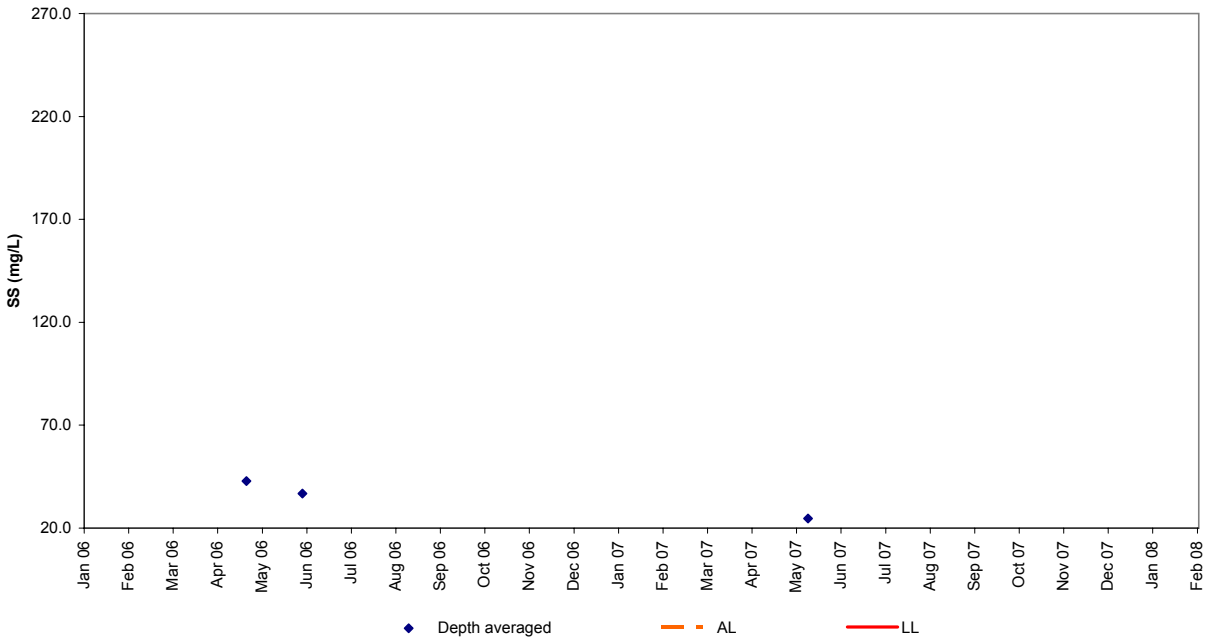
M_BP : Turbidity (Large in Scale)



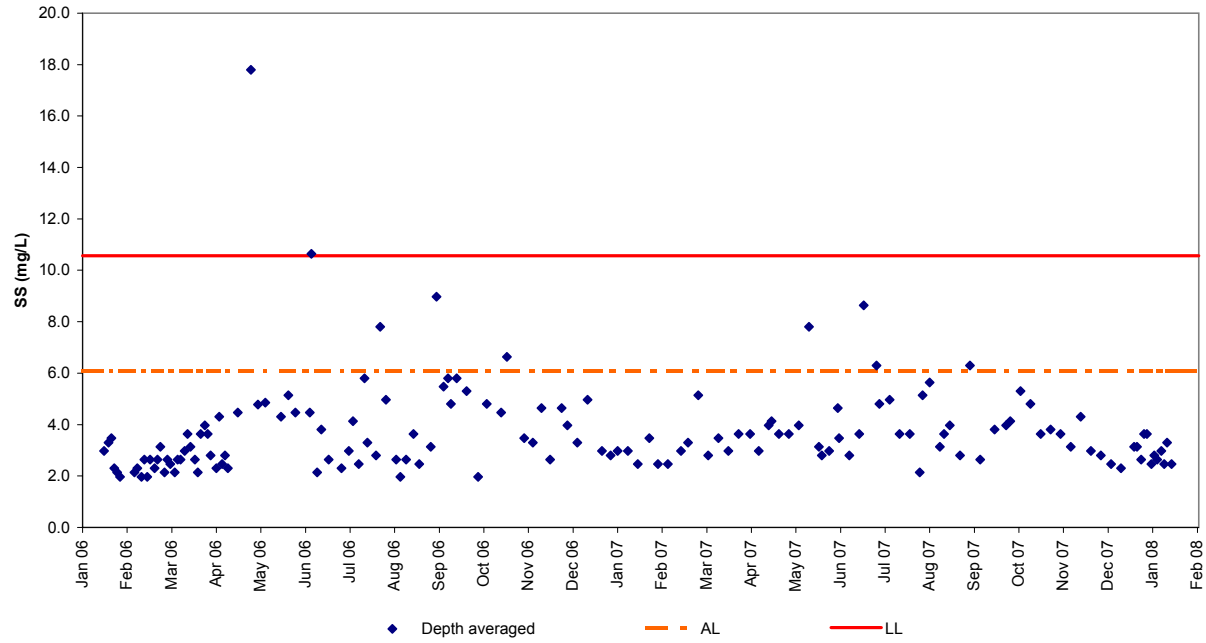
M_BP : Turbidity (Normal in Scale)



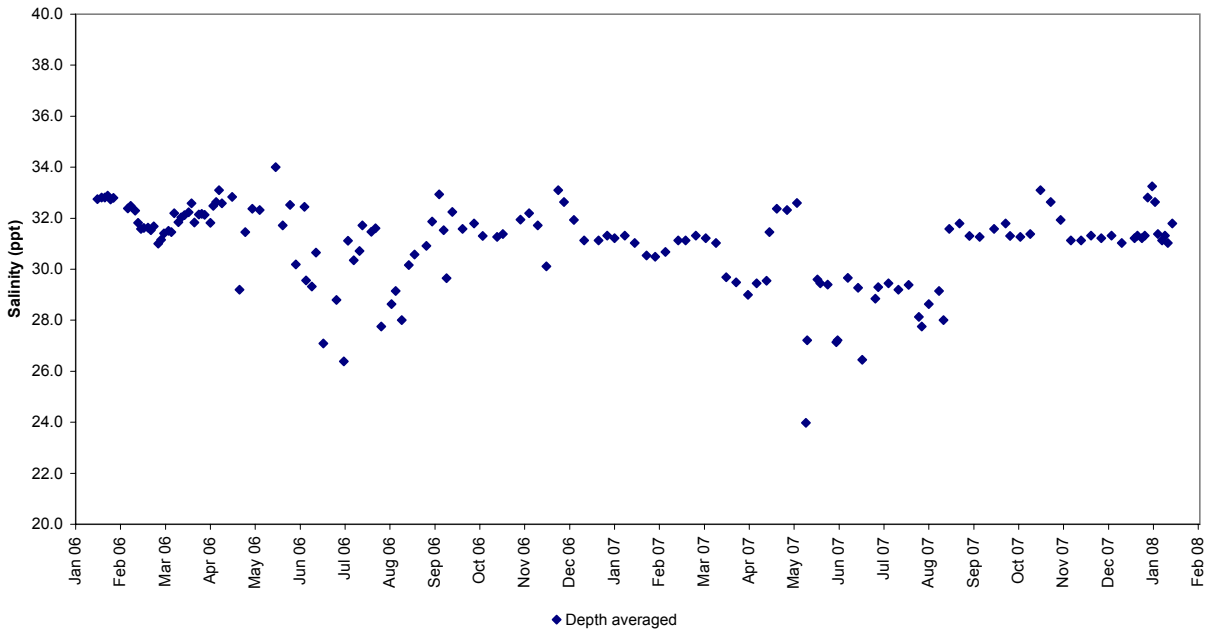
M_BP : Suspended Solids (Large in Scale)



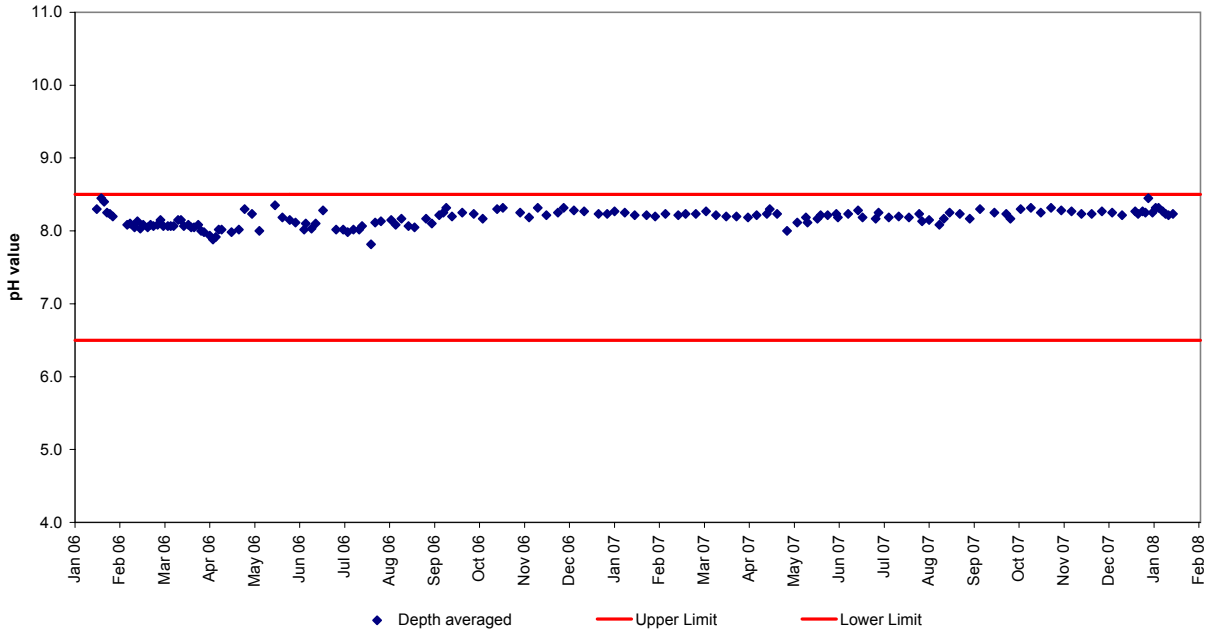
M_BP : Suspended Solids (Normal in Scale)



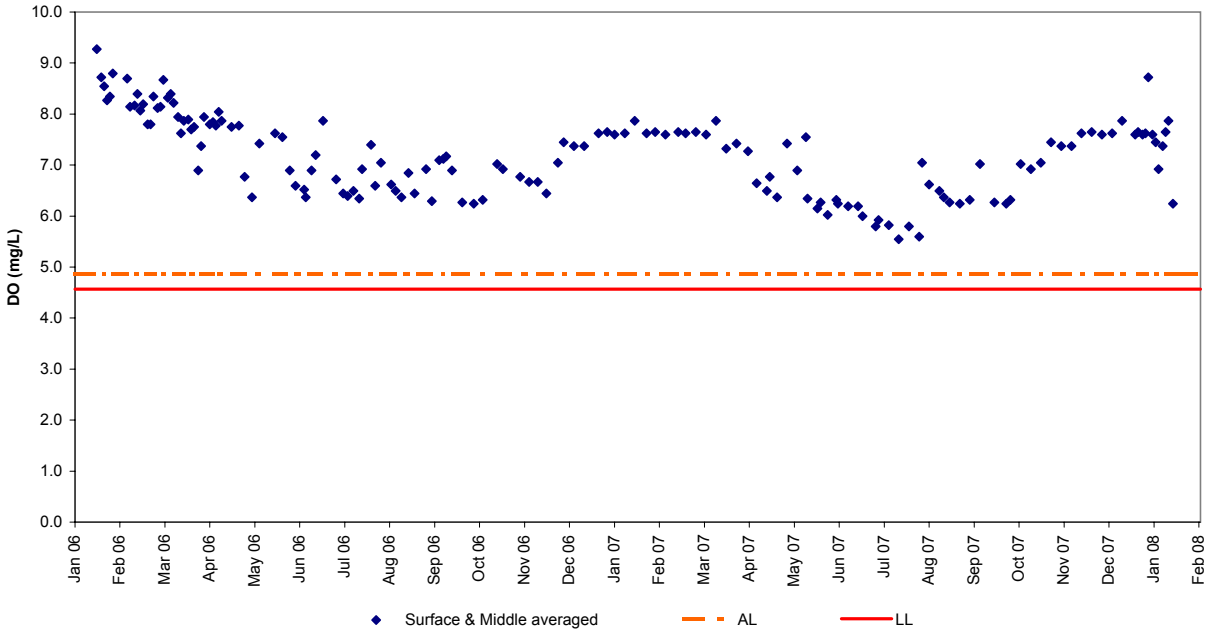
M_Coral : Salinity



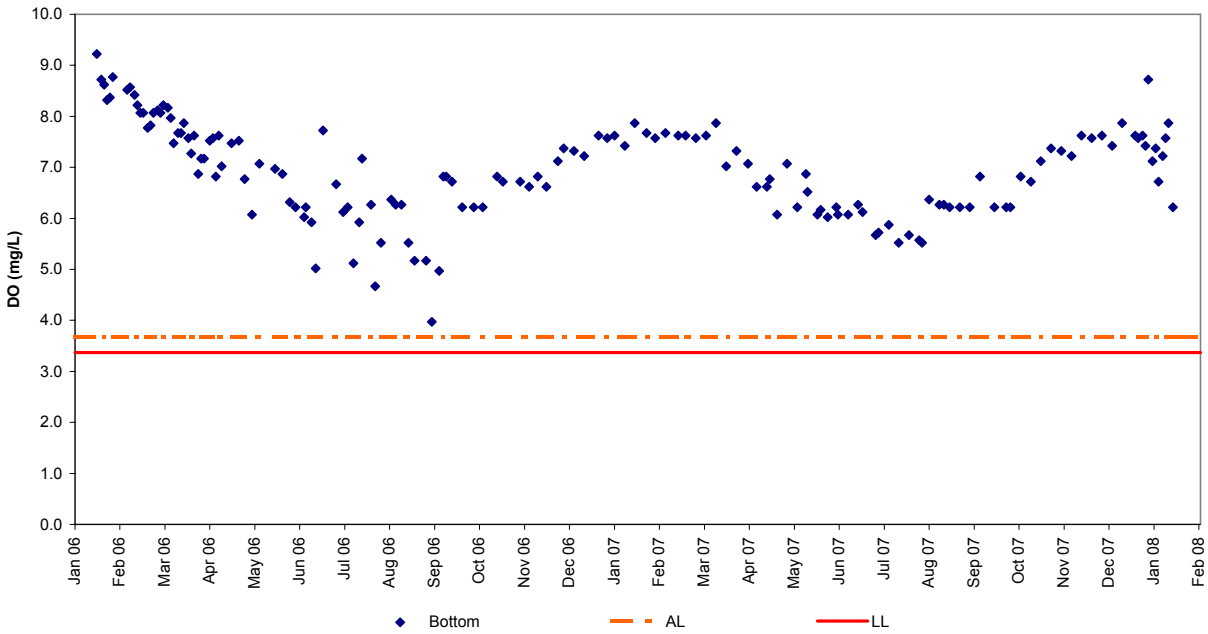
M_Coral : pH



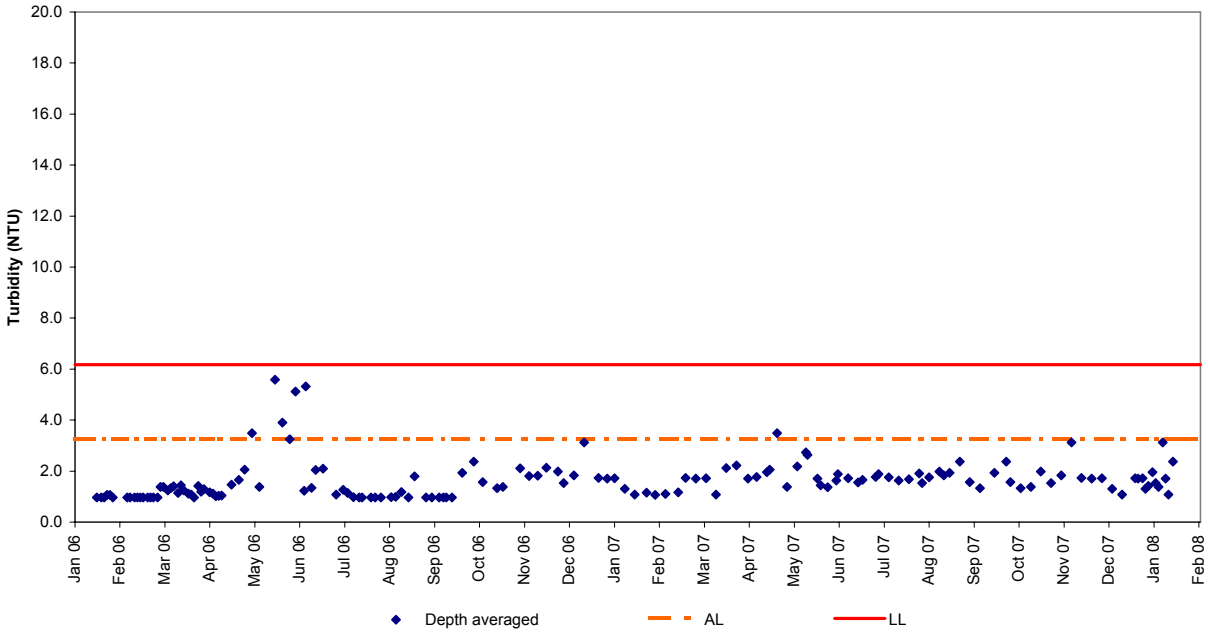
M_Coral : Dissolved Oxygen (Surface & Middle)



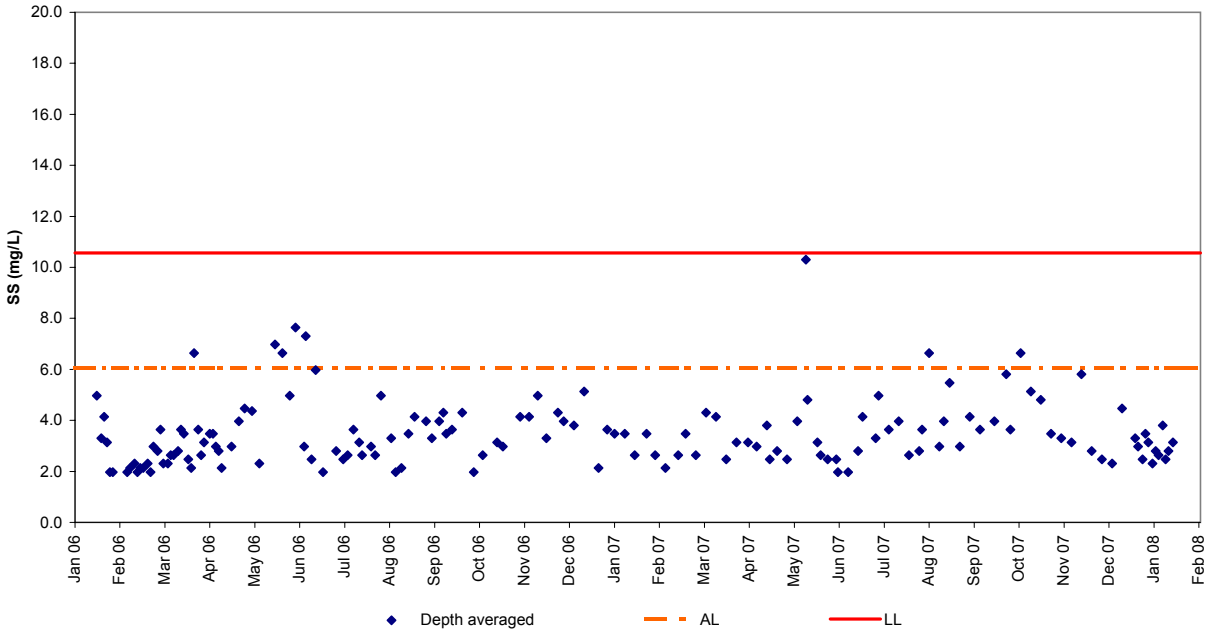
M_Coral : Dissolved Oxygen (Bottom)



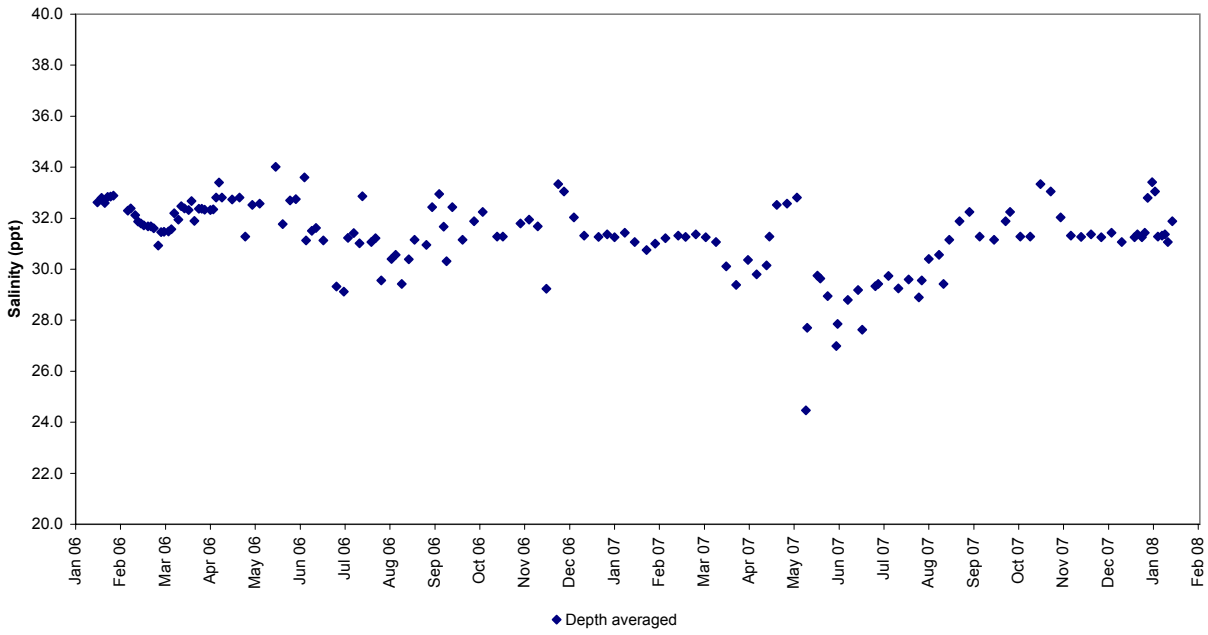
M_Coral : Turbidity



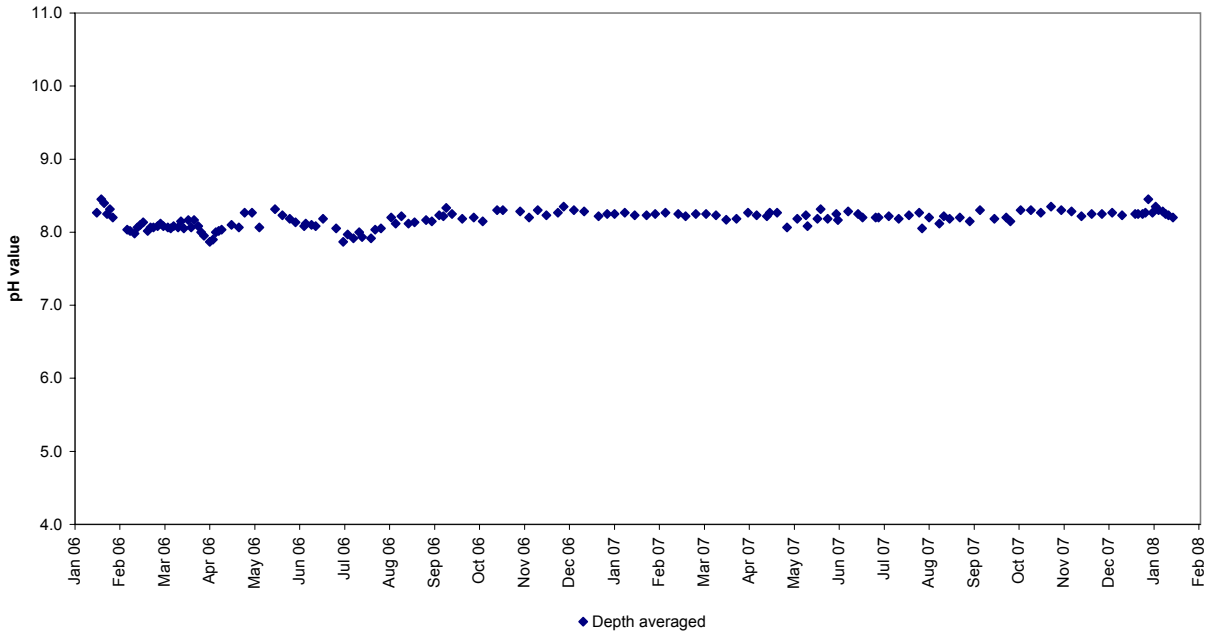
M_Coral : Suspended Solids



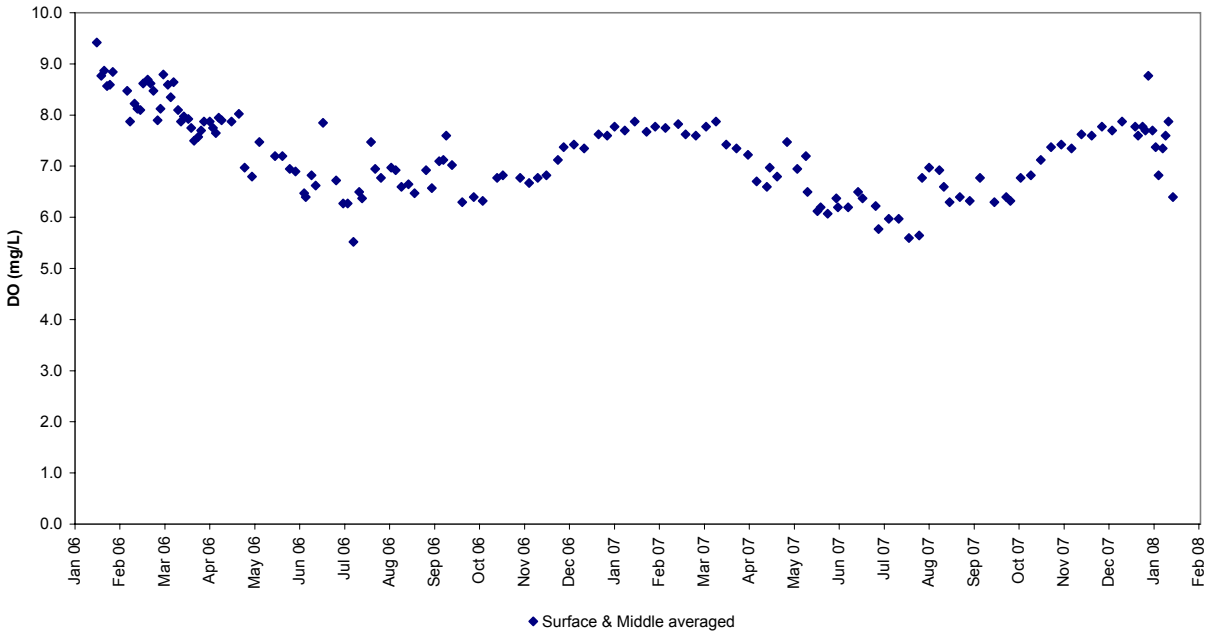
M_B : Salinity



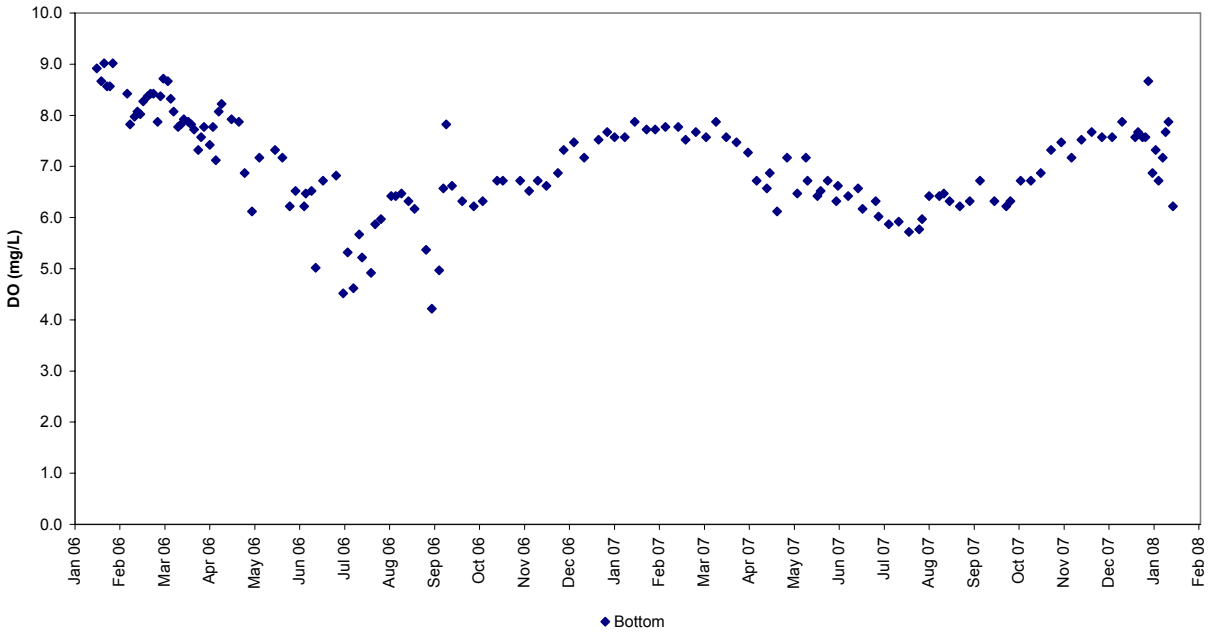
M_B : pH

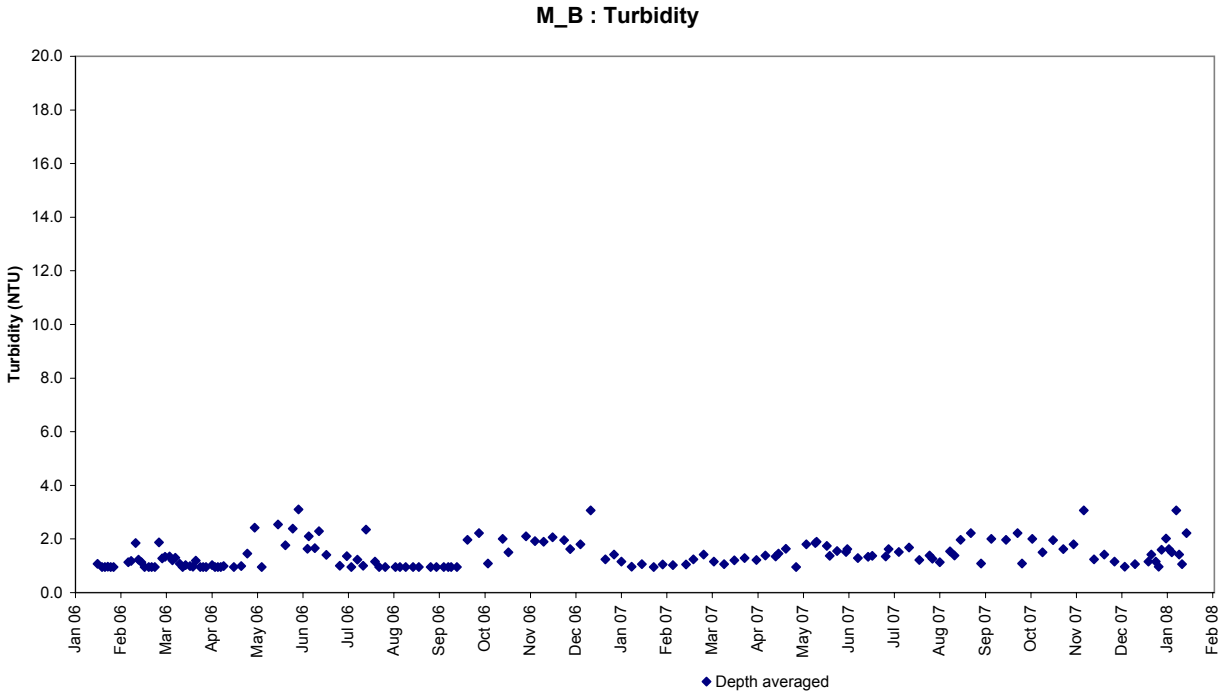


M_B : Dissolved Oxygen (Surface & Middle)



M_B : Dissolved Oxygen (Bottom)




M_B : Turbidity
Turbidity (NTU)
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jan 06
Feb 06
Mar 06
Apr 06
May 06
Jun 06
Jul 06
Aug 06
Sep 06
Oct 06
Nov 06
Dec 06
Jan 07
Feb 07
Mar 07
Apr 07
May 07
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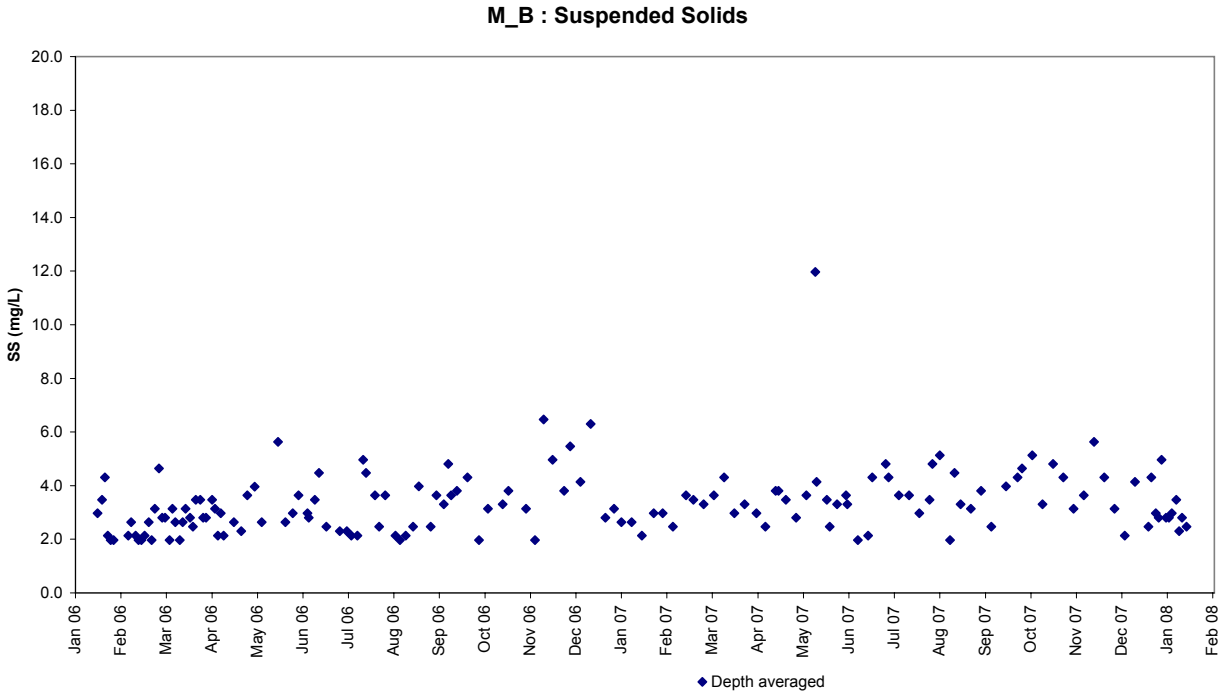
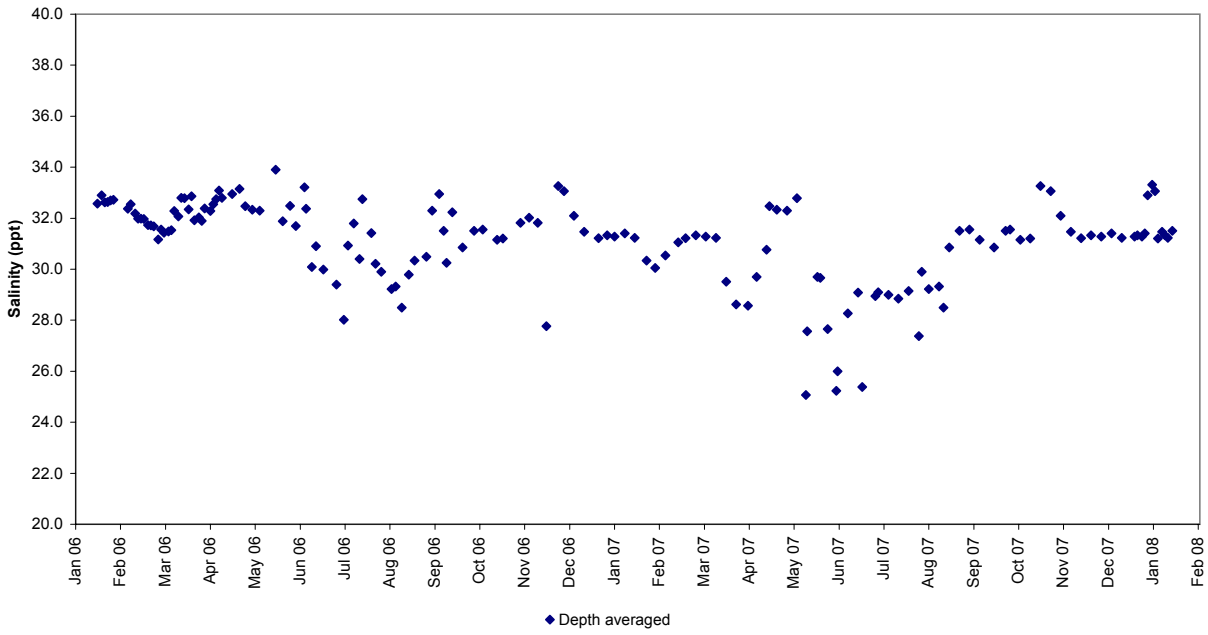
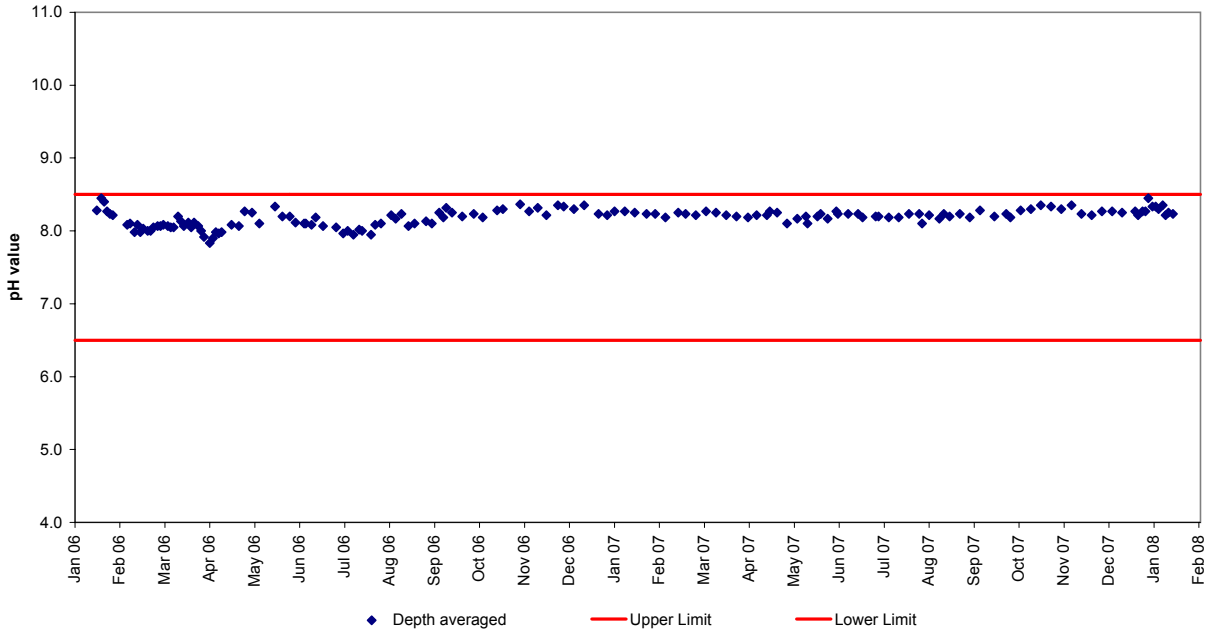
Jul 07
Aug 07
Sep 07
Oct 07
Nov 07
Dec 07
Jan 08
Feb 08
Depth averaged


M_B : Suspended Solids
SS (mg/L)
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
Jan 06
Feb 06
Mar 06
Apr 06
May 06
Jun 06
Jul 06
Aug 06
Sep 06
Oct 06
Nov 06
Dec 06
Jan 07
Feb 07
Mar 07
Apr 07
May 07
Jun 07
Jul 07
Aug 07
Sep 07
Oct 07
Nov 07
Dec 07
Jan 08
Feb 08
Depth averaged

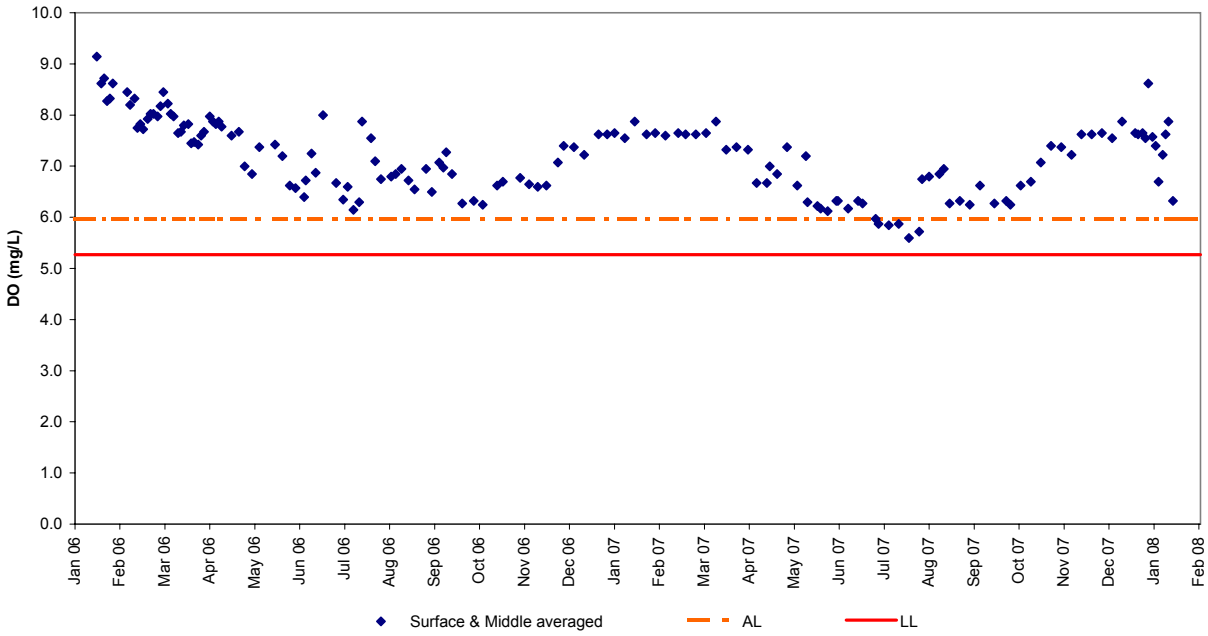
KS : Salinity



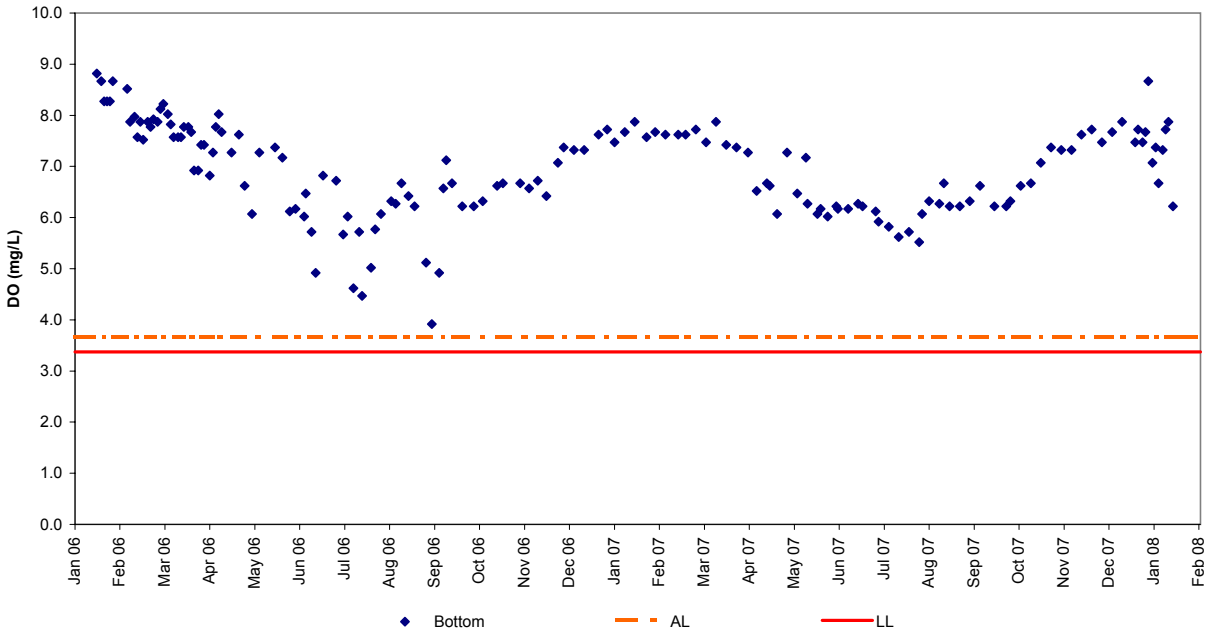
KS : pH



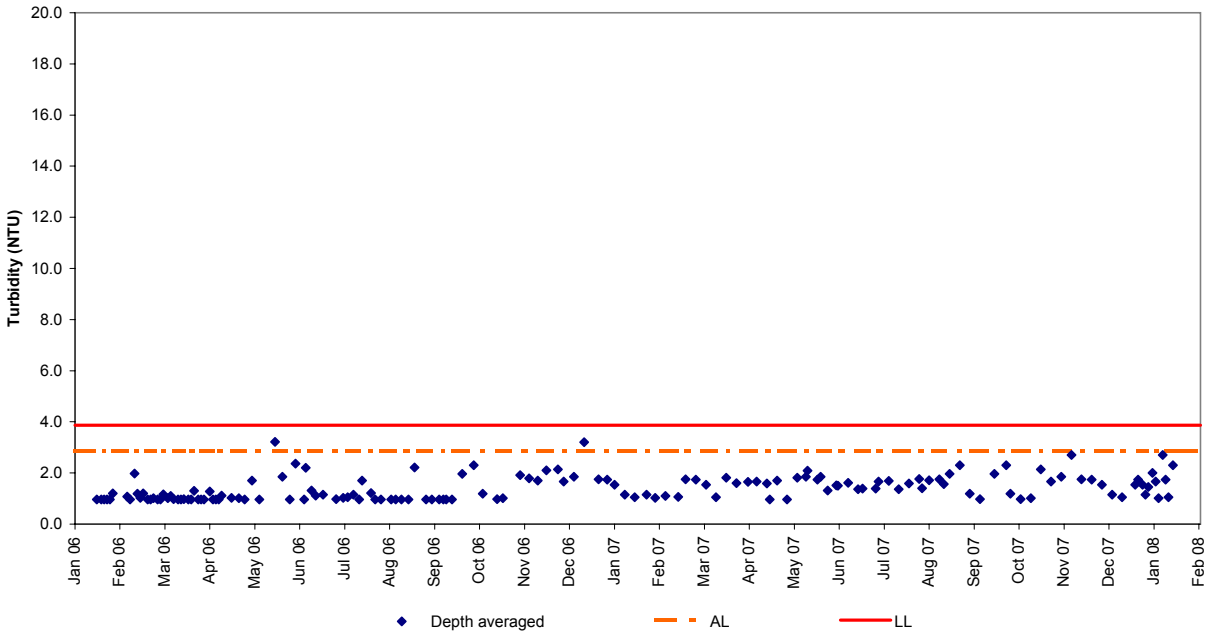
KS : Dissolved Oxygen (Surface & Middle)



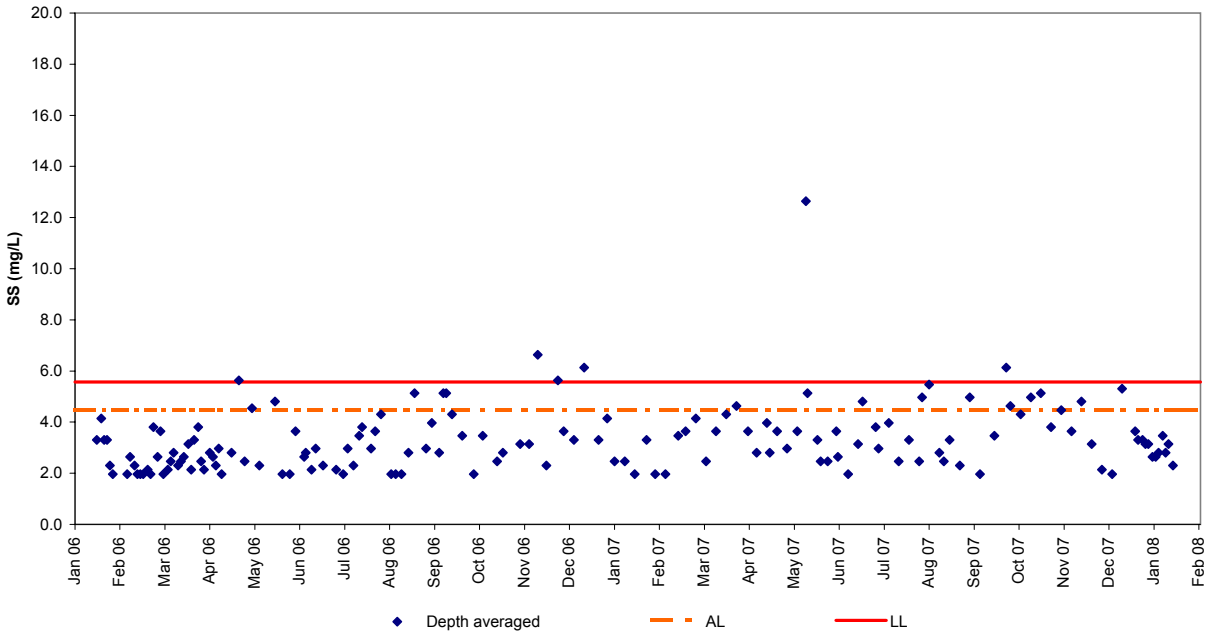
KS : Dissolved Oxygen (Bottom)



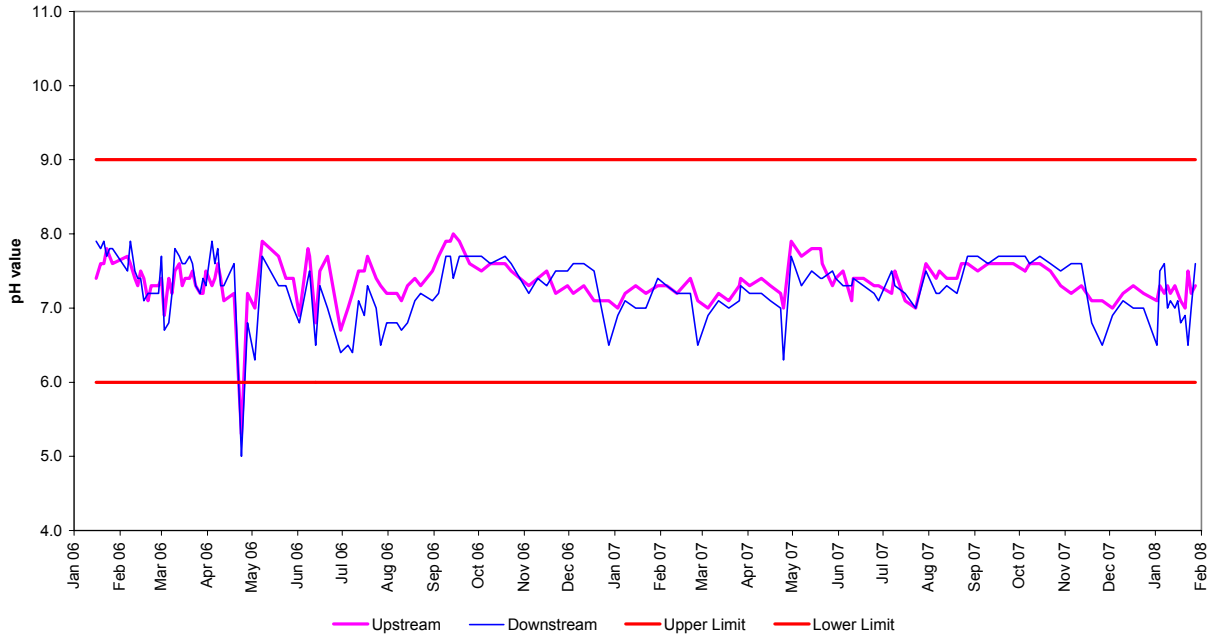
KS : Turbidity



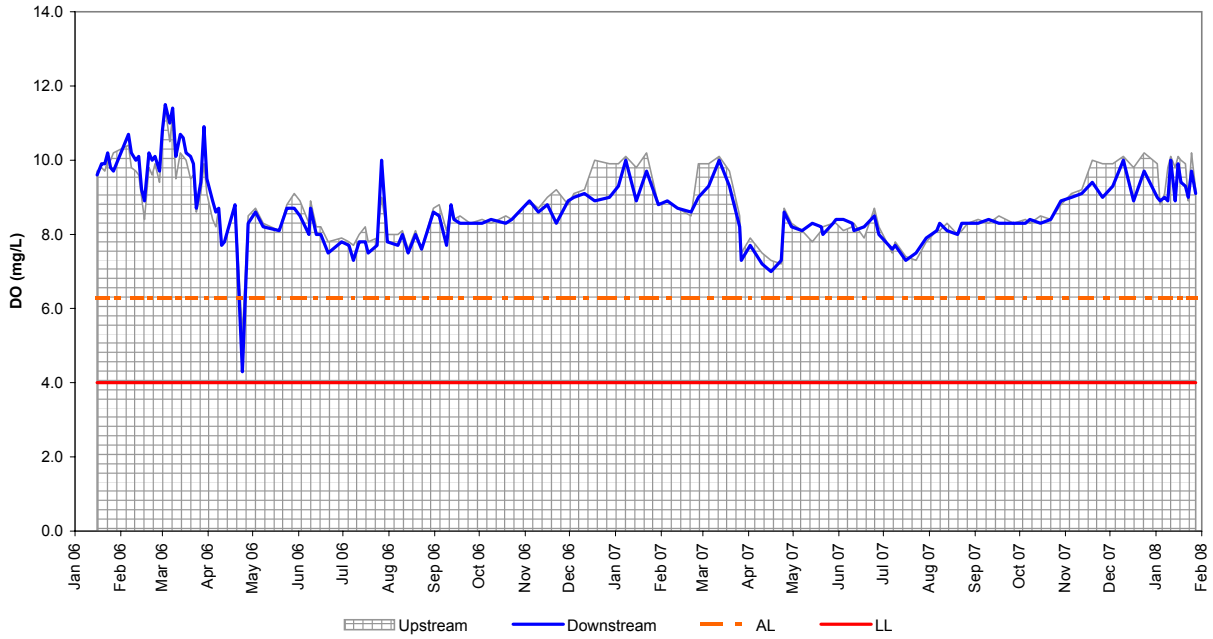
KS : Suspended Solids



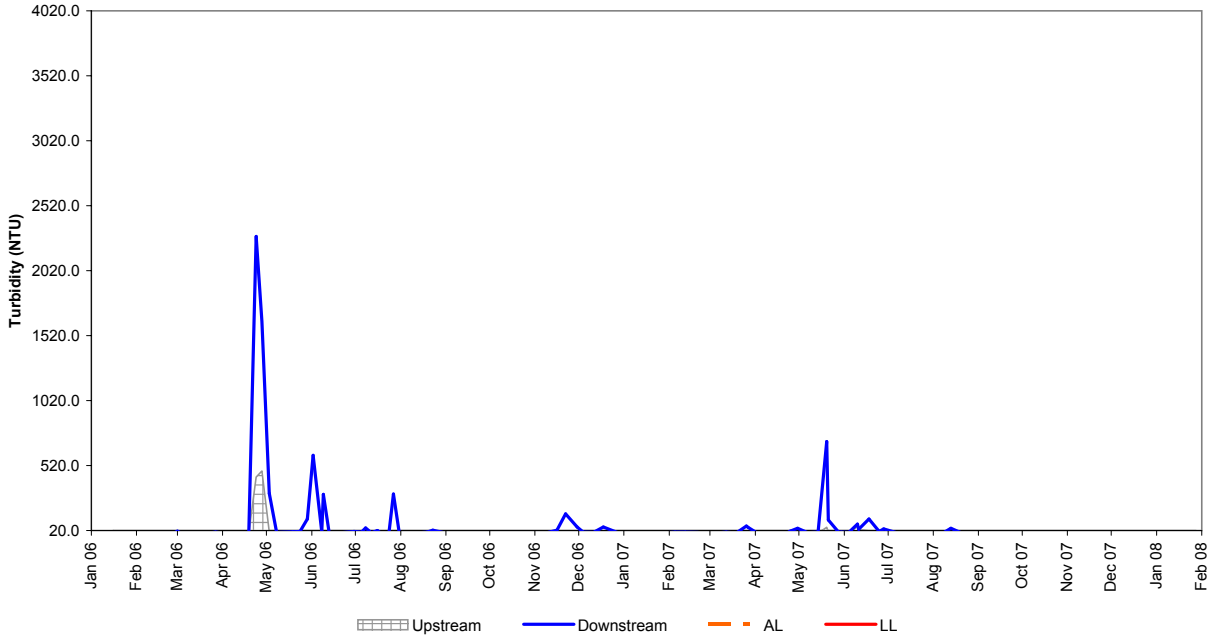
F_A : pH



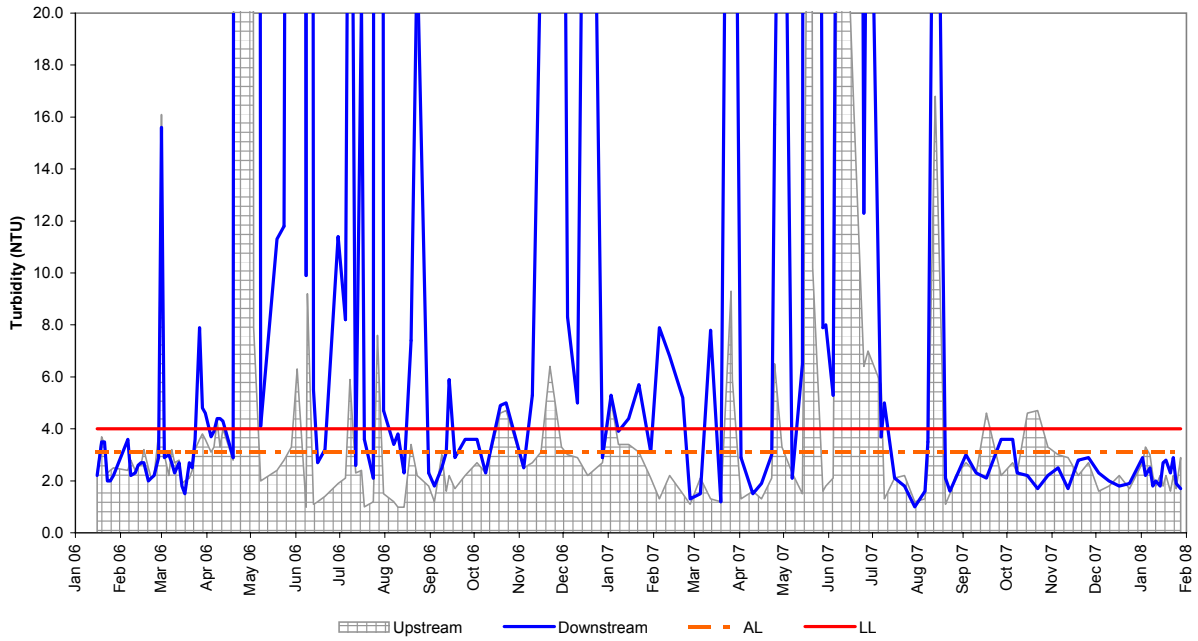
F_A : Dissolved Oxygen



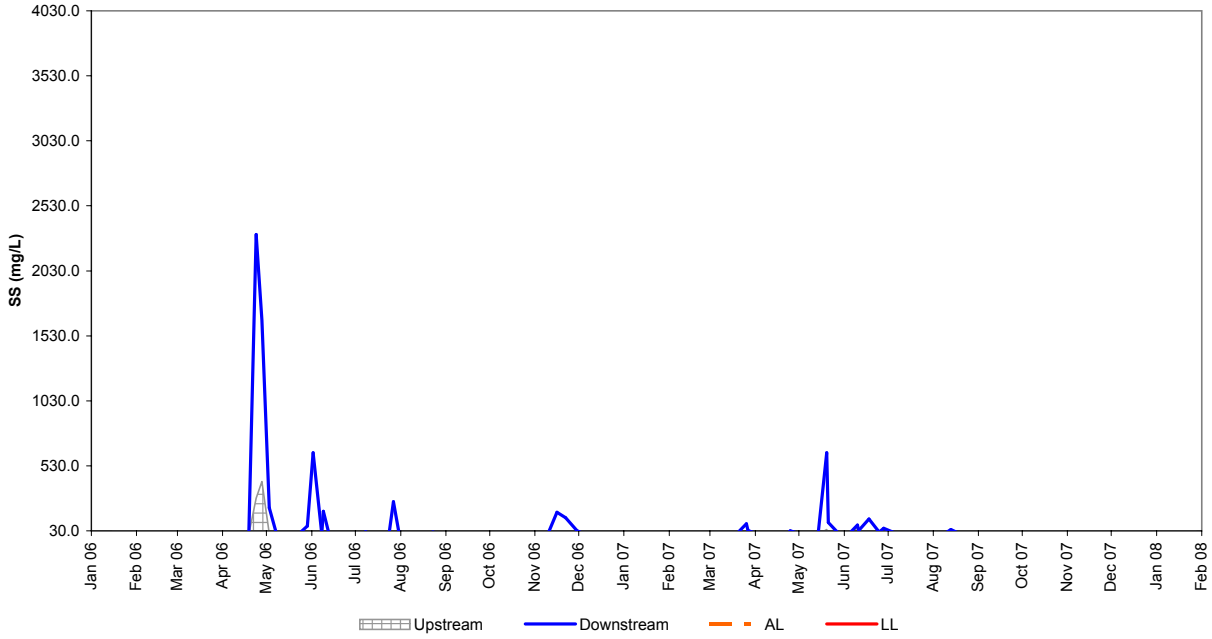
F_A : Turbidity (Large in Scale)



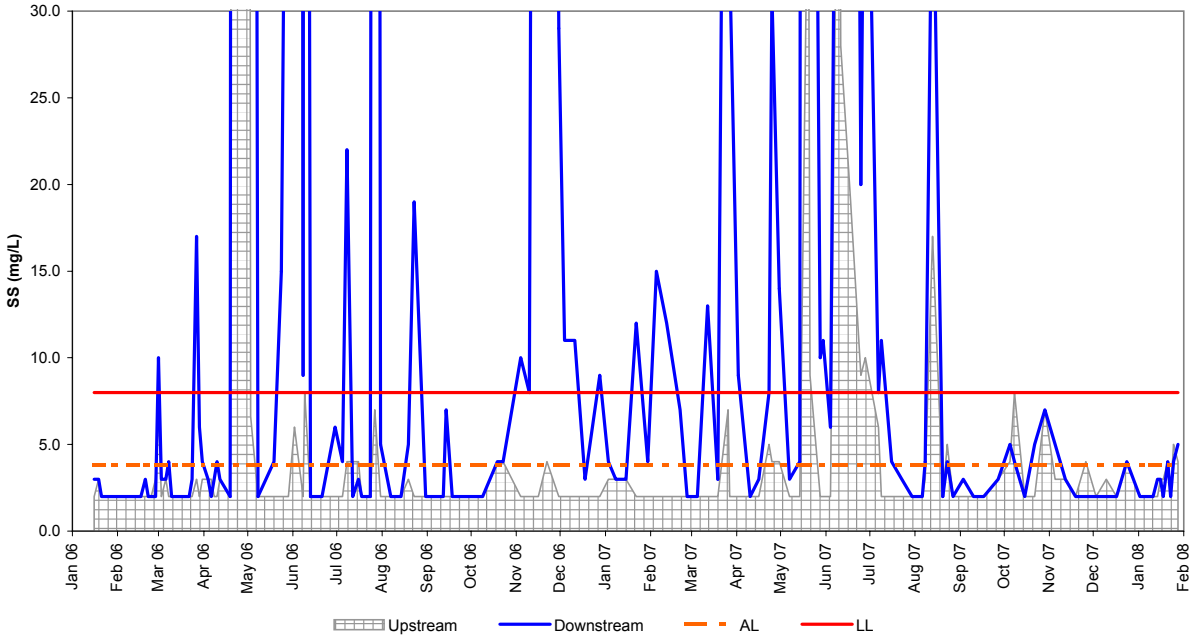
F_A : Turbidity (Normal in Scale)



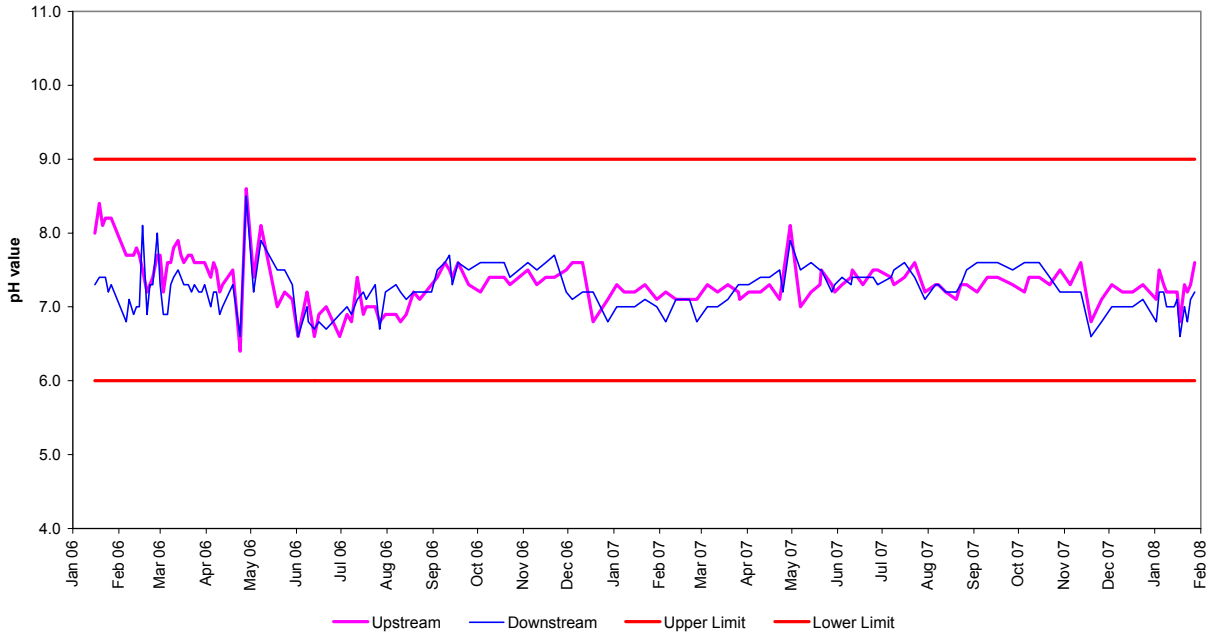
F_A : Suspended Solids (Large in Scale)



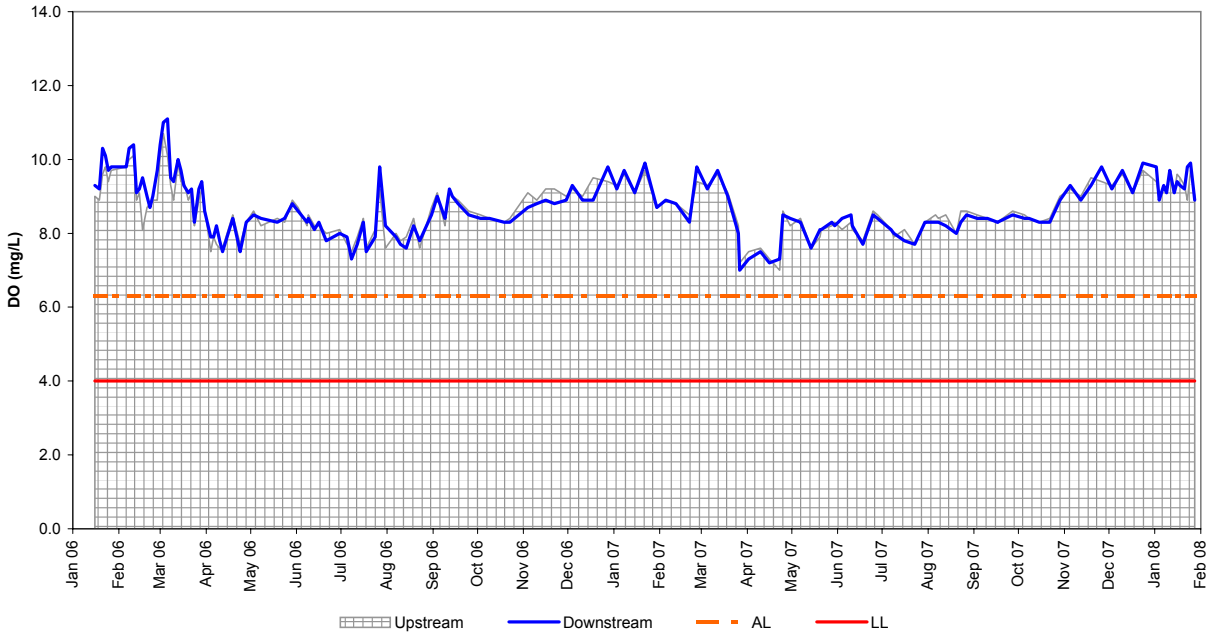
F_A : Suspended Solids (Normal in Scale)



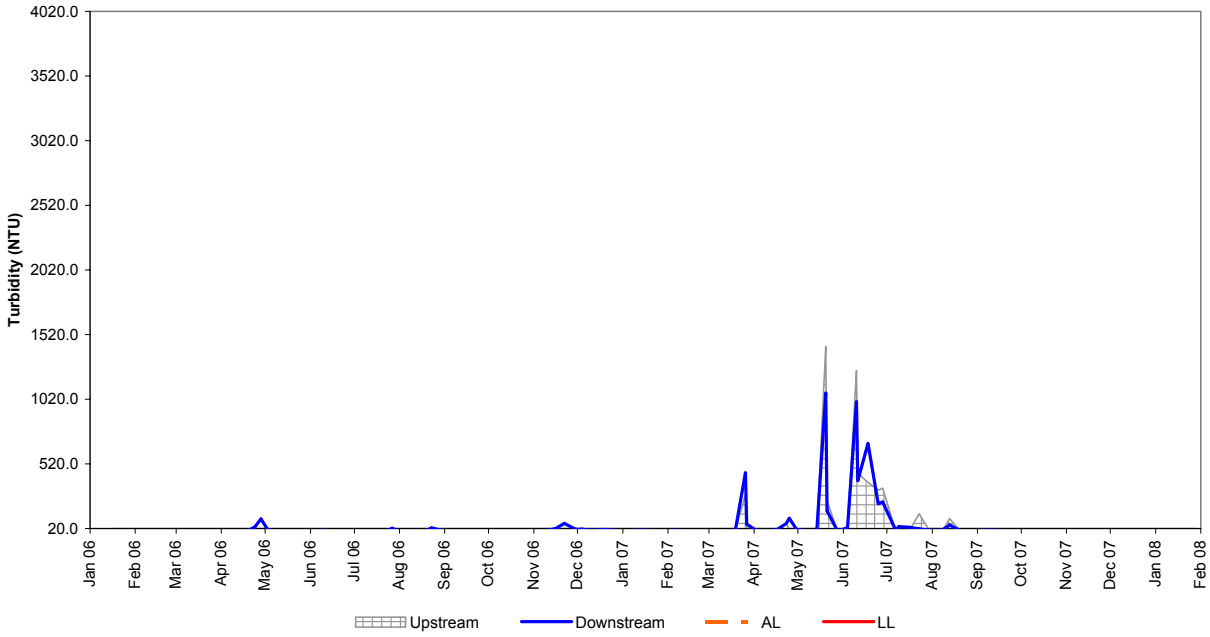
F_B : pH



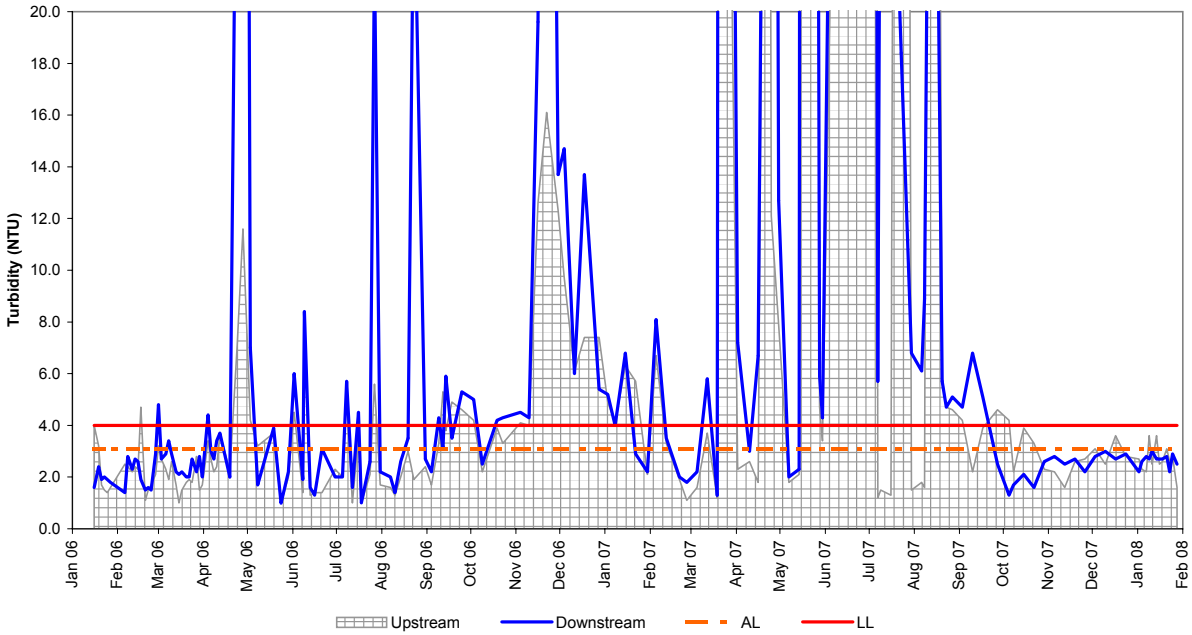
F_B : Dissolved Oxygen



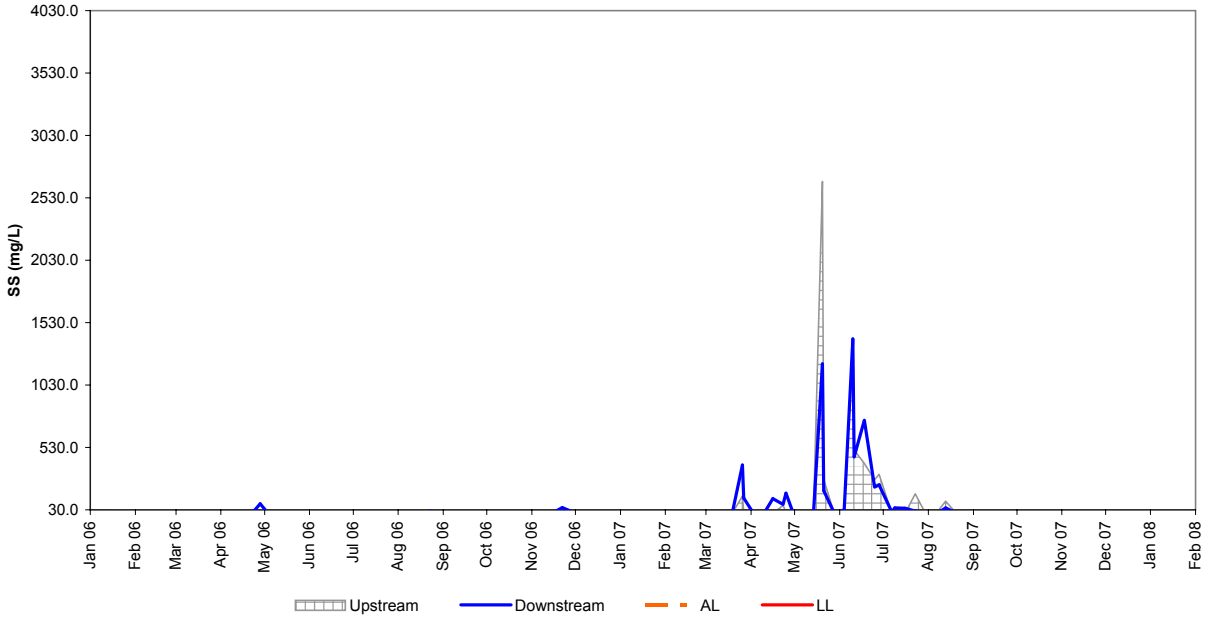
F_B : Turbidity (Large in Scale)



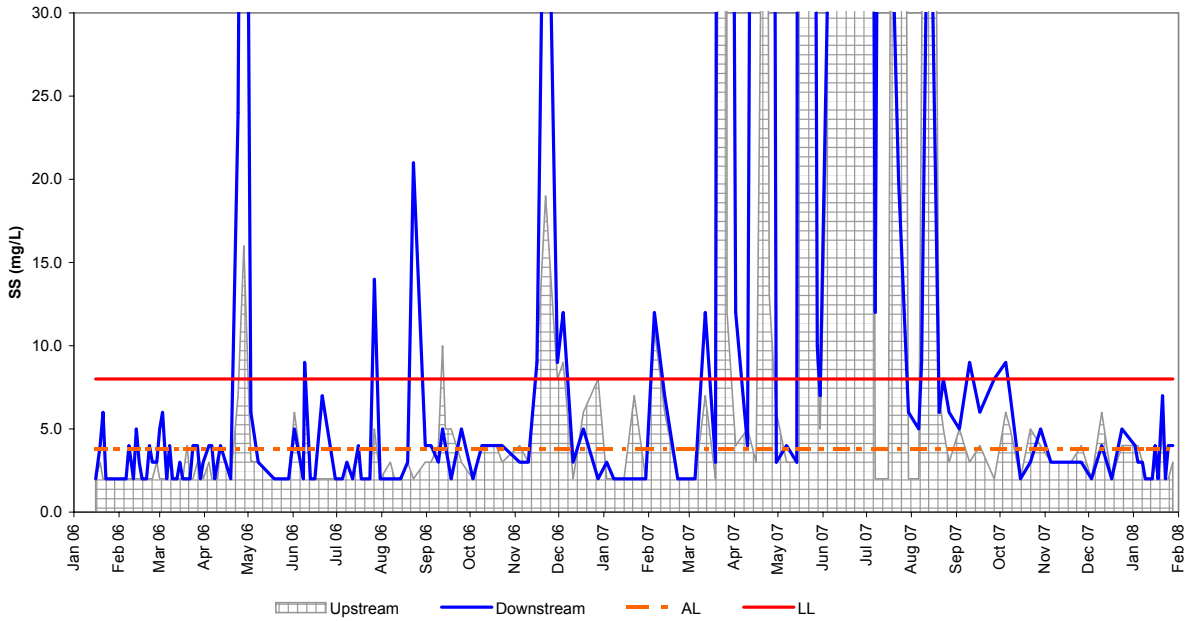
F_B : Turbidity (Normal in Scale)



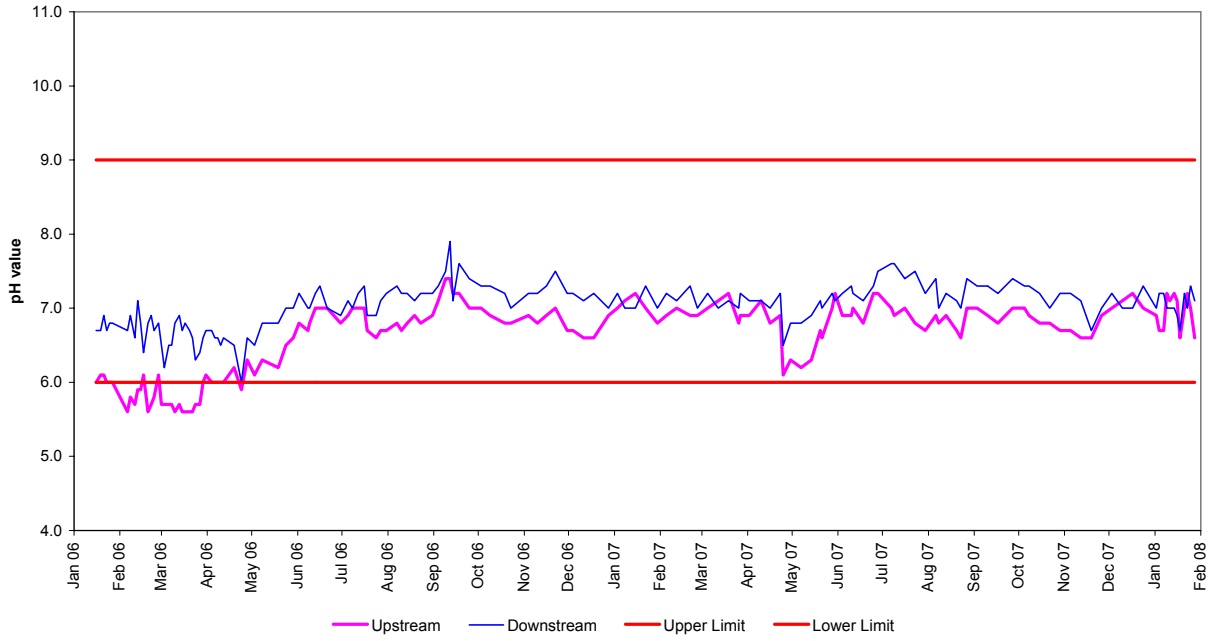
F_B : Suspended Solids (Large in Scale)



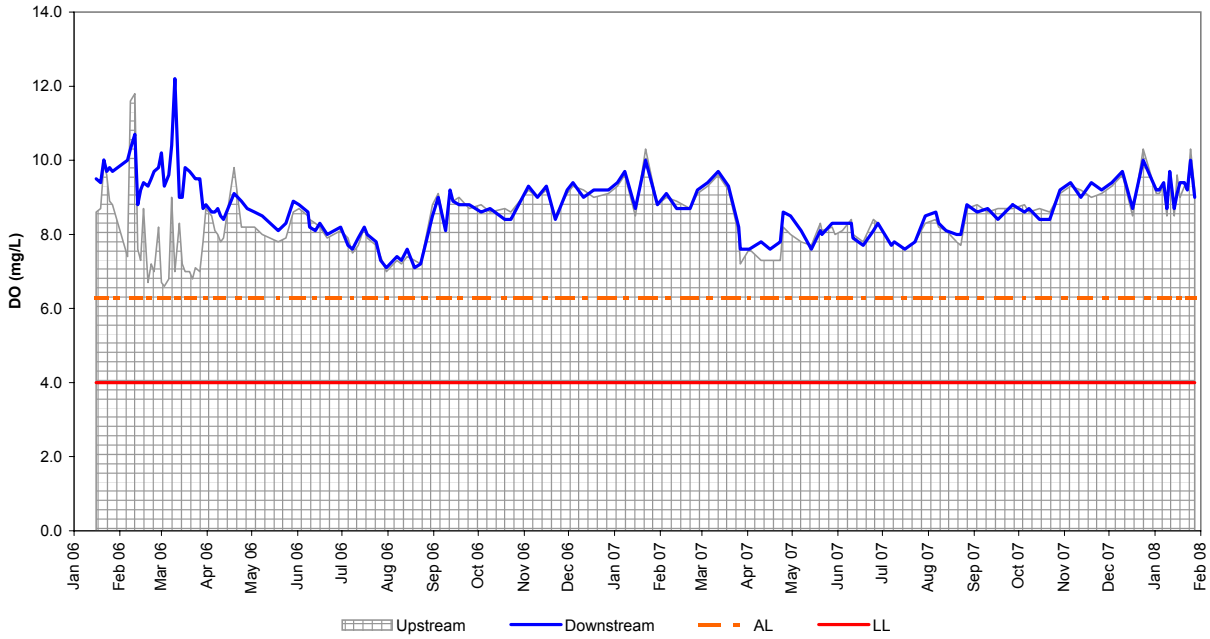
F_B : Suspended Solids (Normal in Scale)



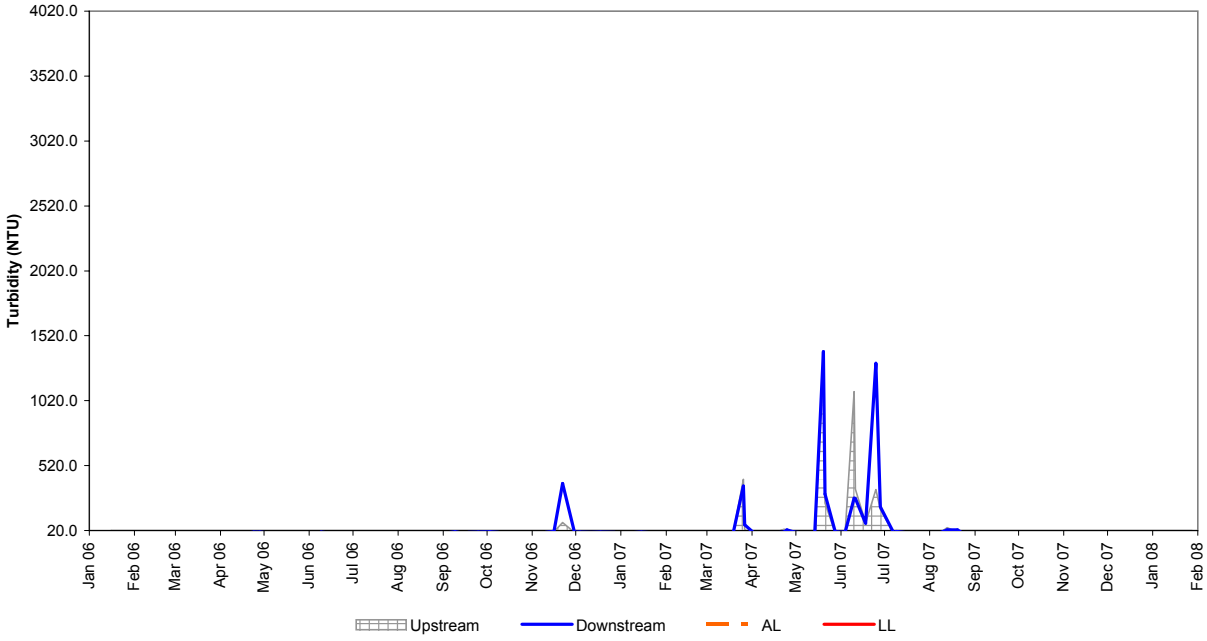
F_C : pH



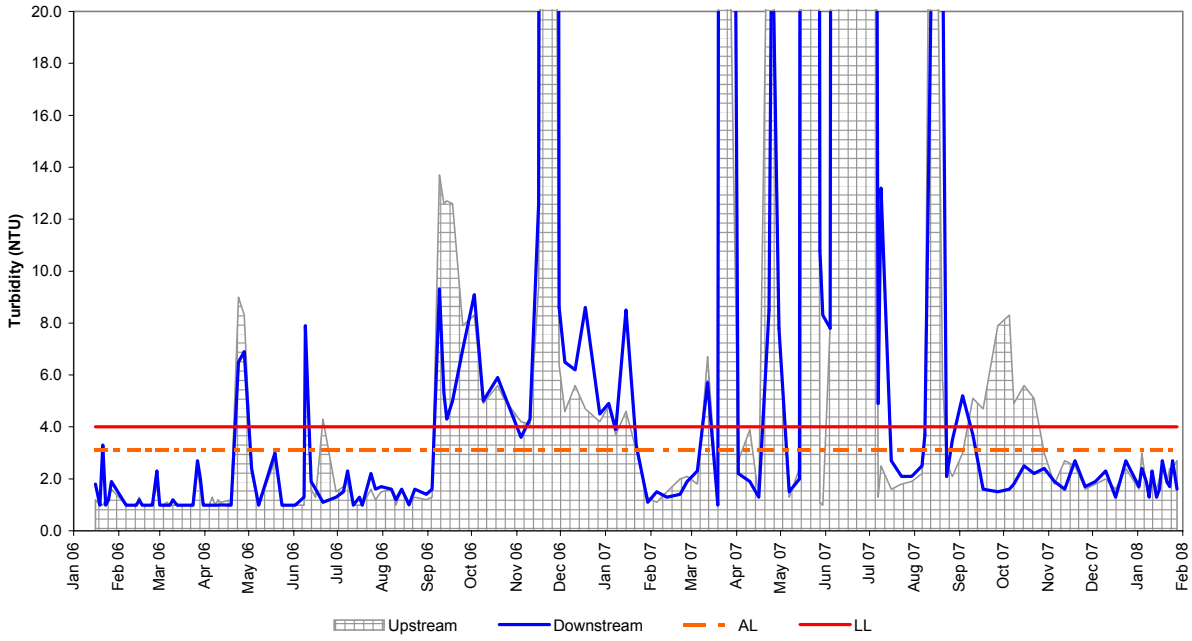
F_C : Dissolved Oxygen



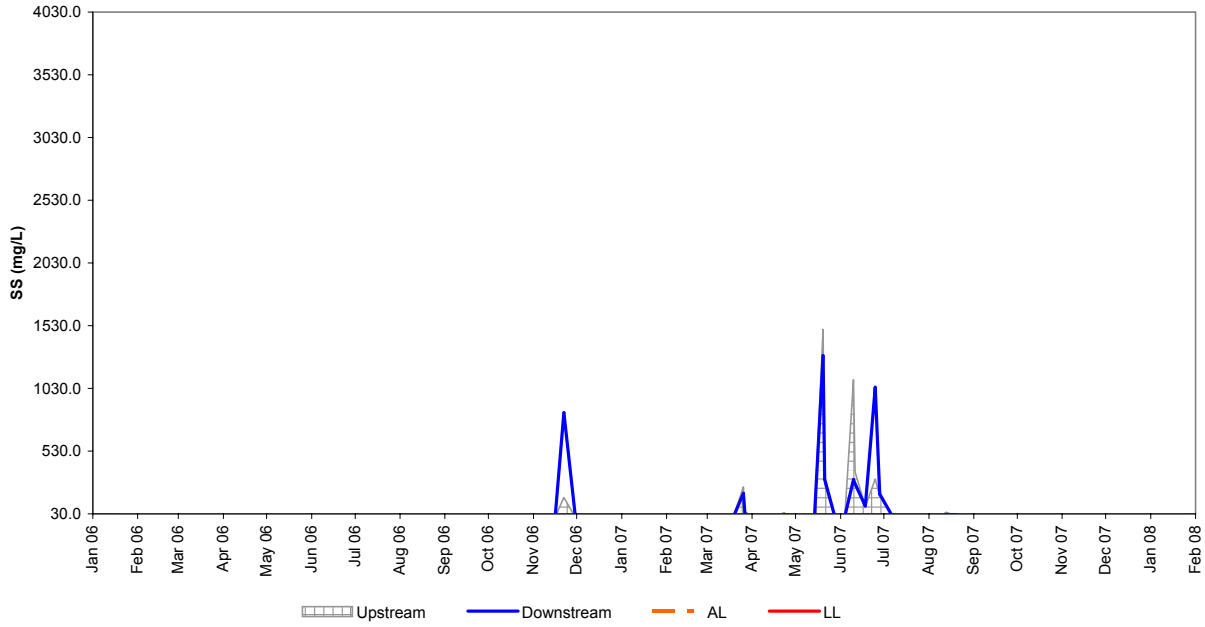
F_C : Turbidity (Large in Scale)



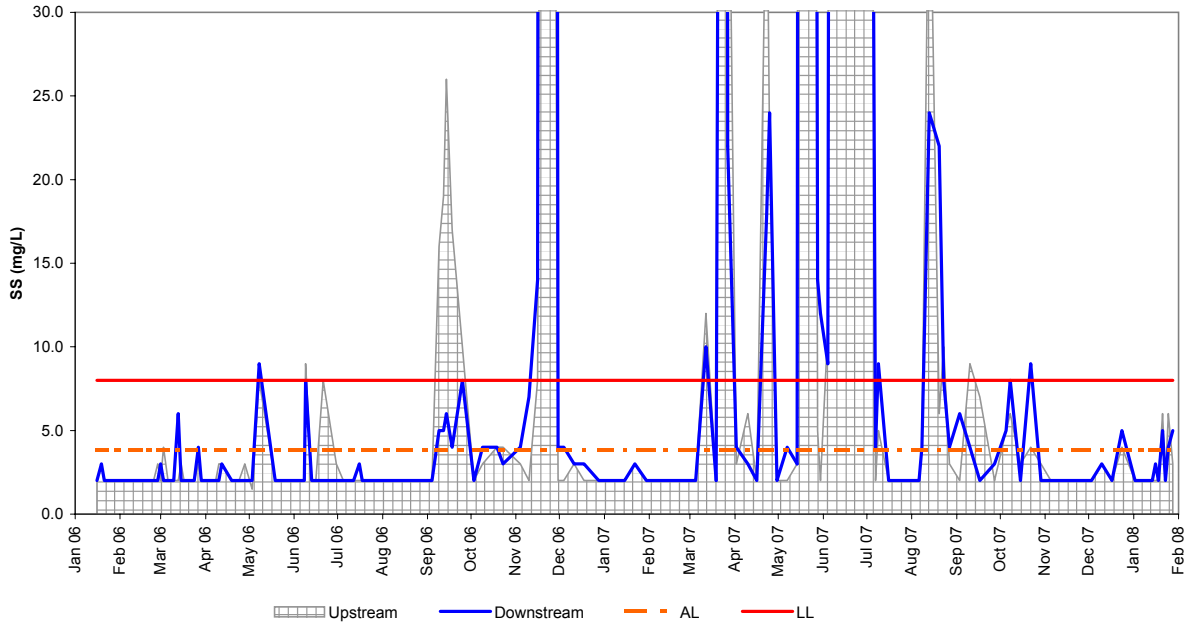
F_C : Turbidity (Normal in Scale)



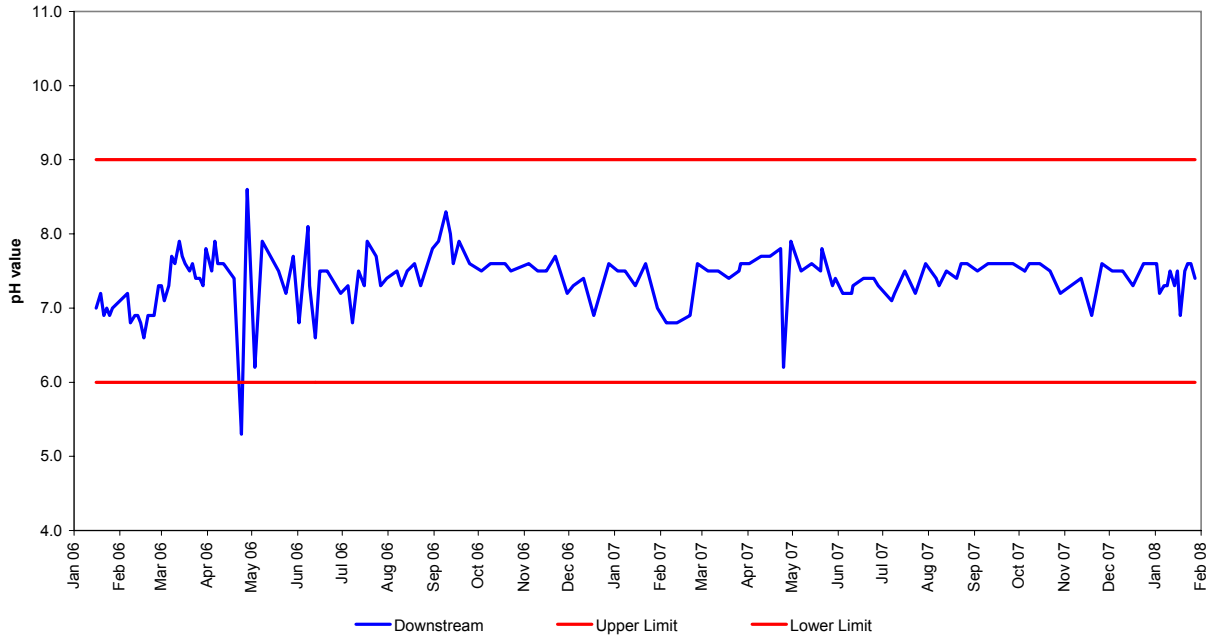
F_C : Suspended Solids (Large in Scale)



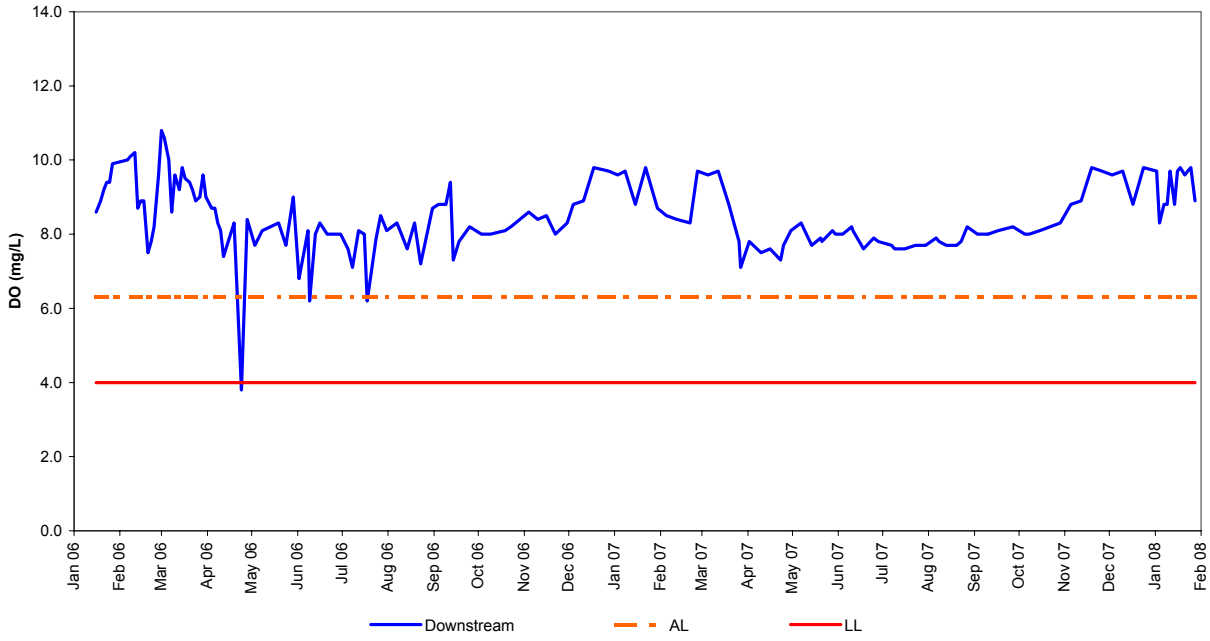
F_C : Suspended Solids (Normal in Scale)



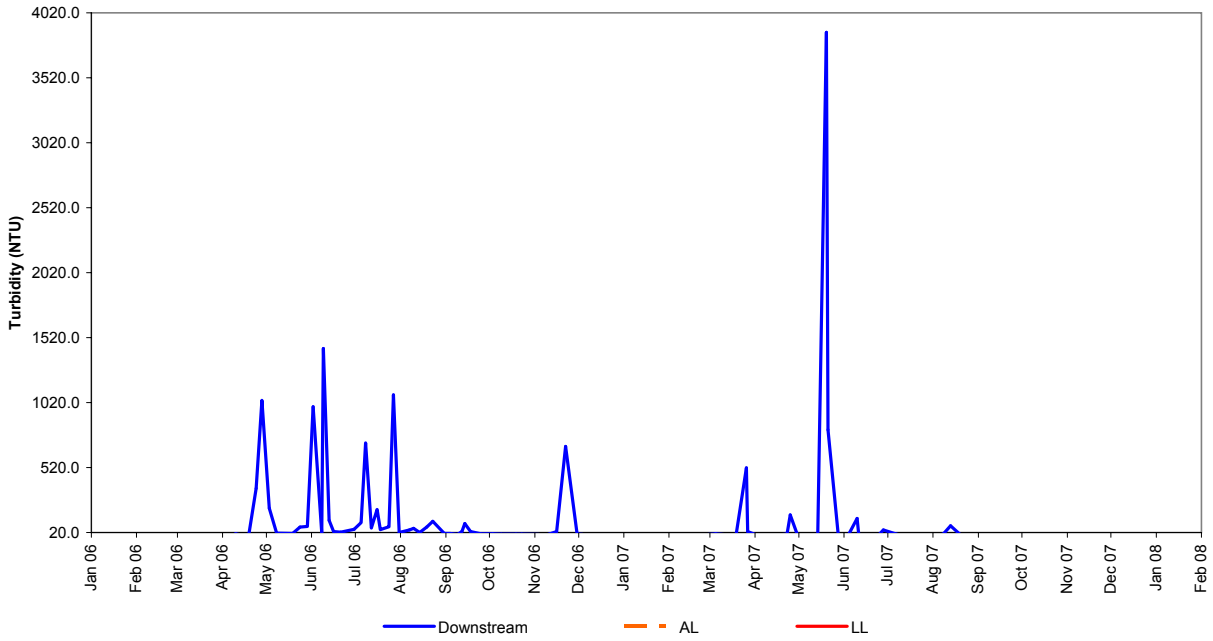
F_Inland M : pH



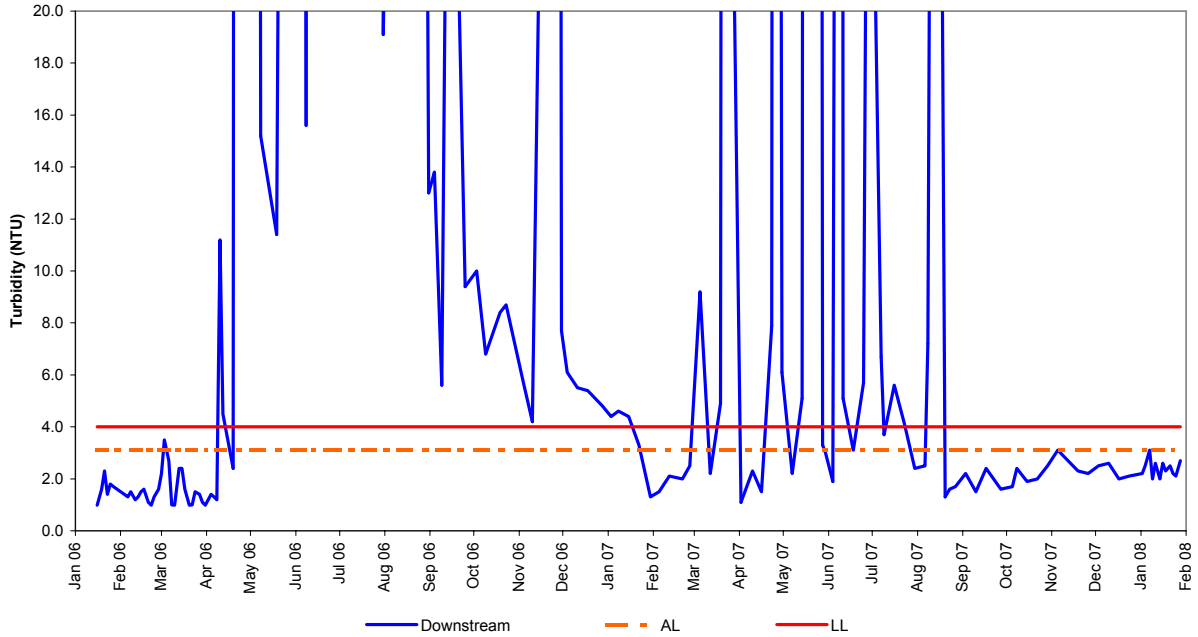
F_Inland M : Dissolved Oxygen



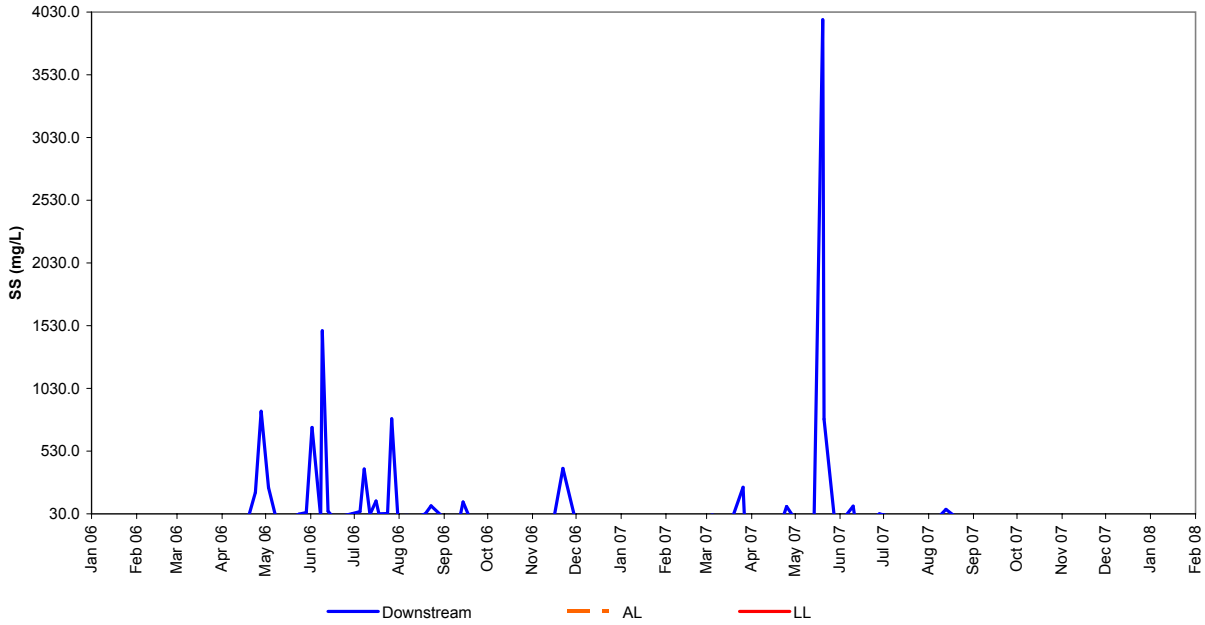
F_Inland M : Turbidity (Large in Scale)



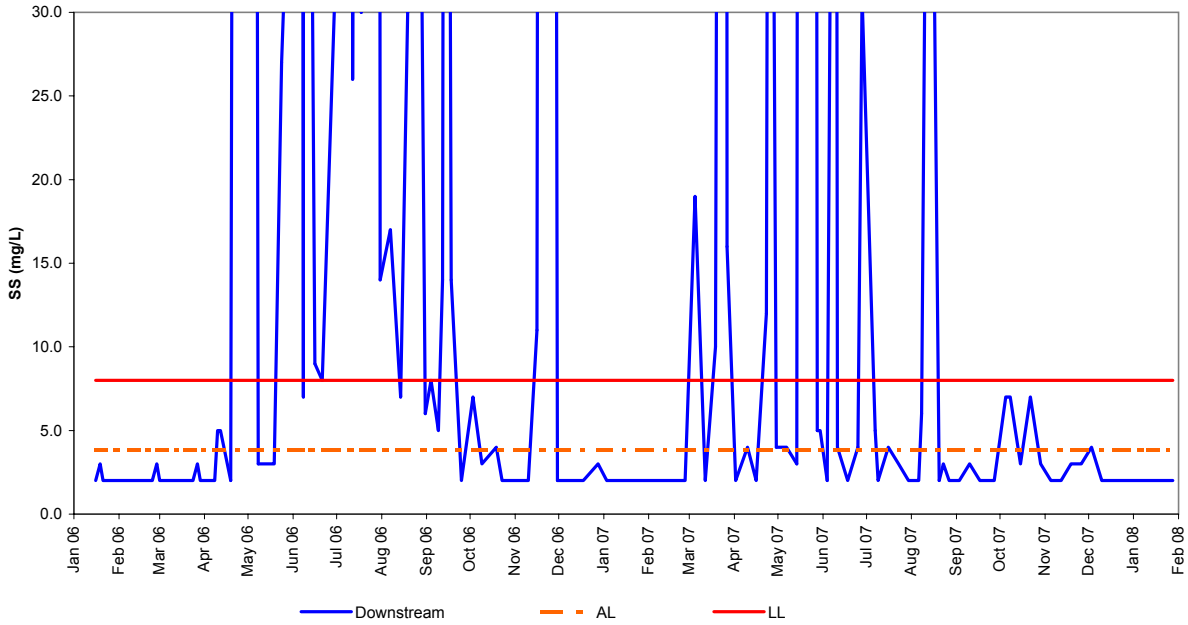
F_Inland M : Turbidity (Normal in Scale)



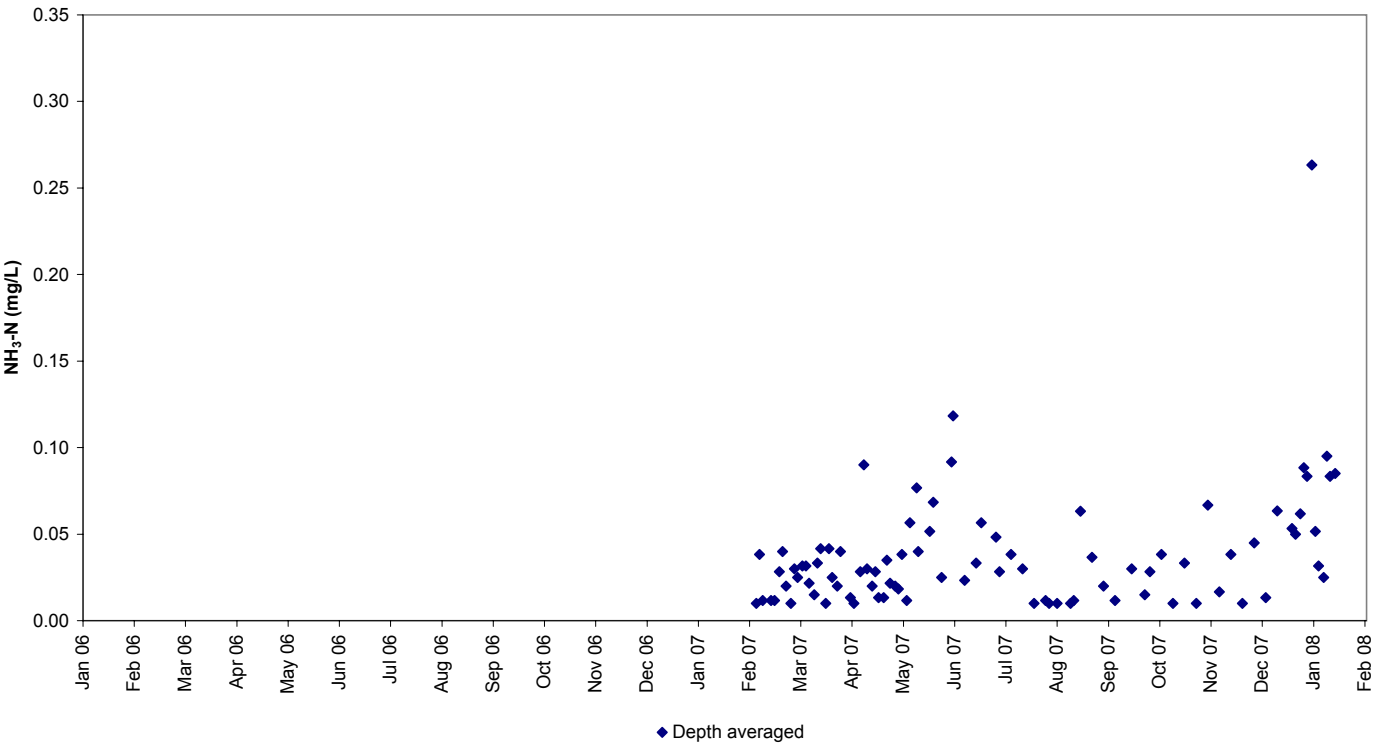
F_Inland M : Suspended Solids (Large in Scale)



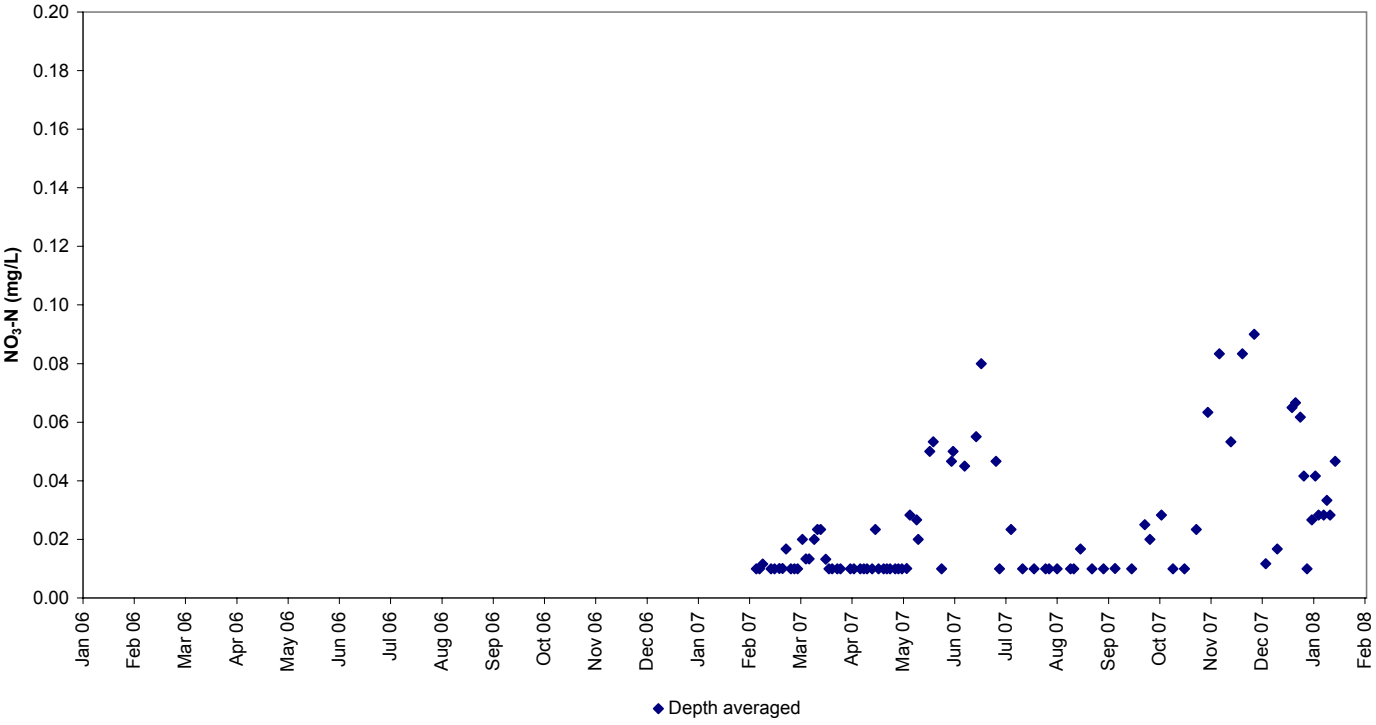
F_Inland M : Suspended Solids (Normal in Scale)



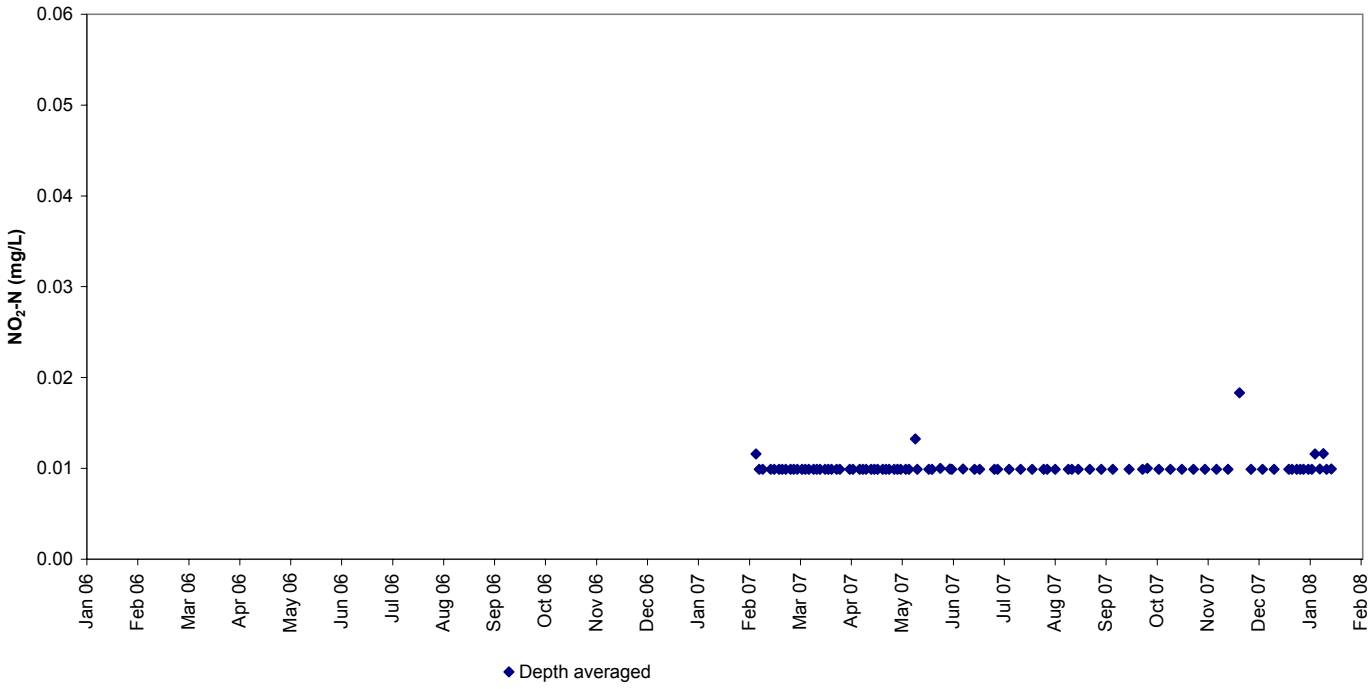
M_A : Ammonia Nitrogen



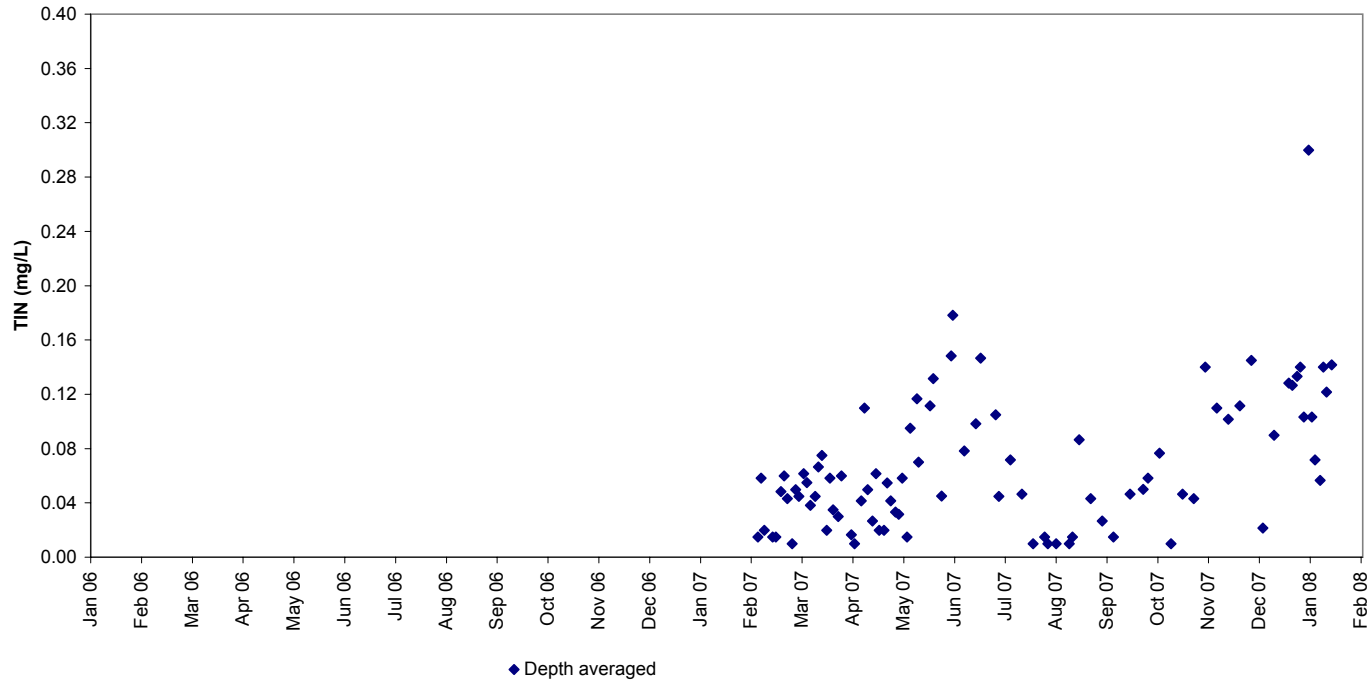
M_A : Nitrate Nitrogen



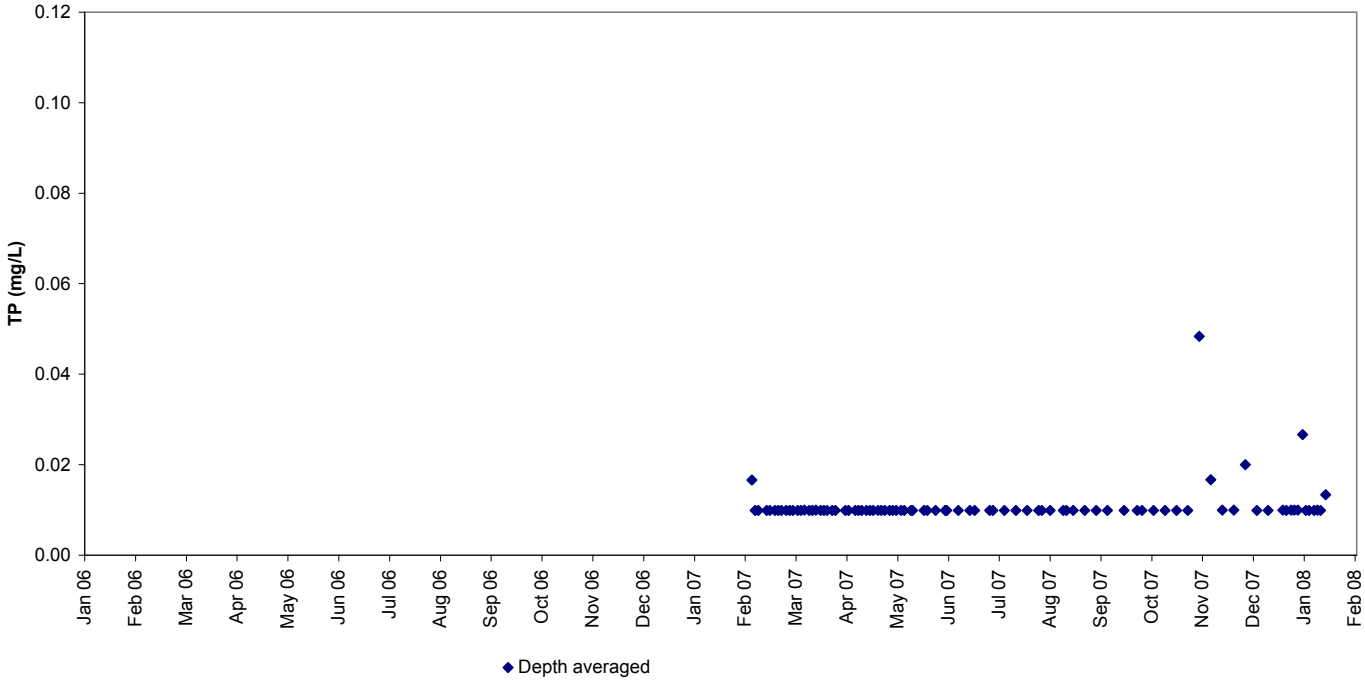
M_A : Nitrite Nitrogen



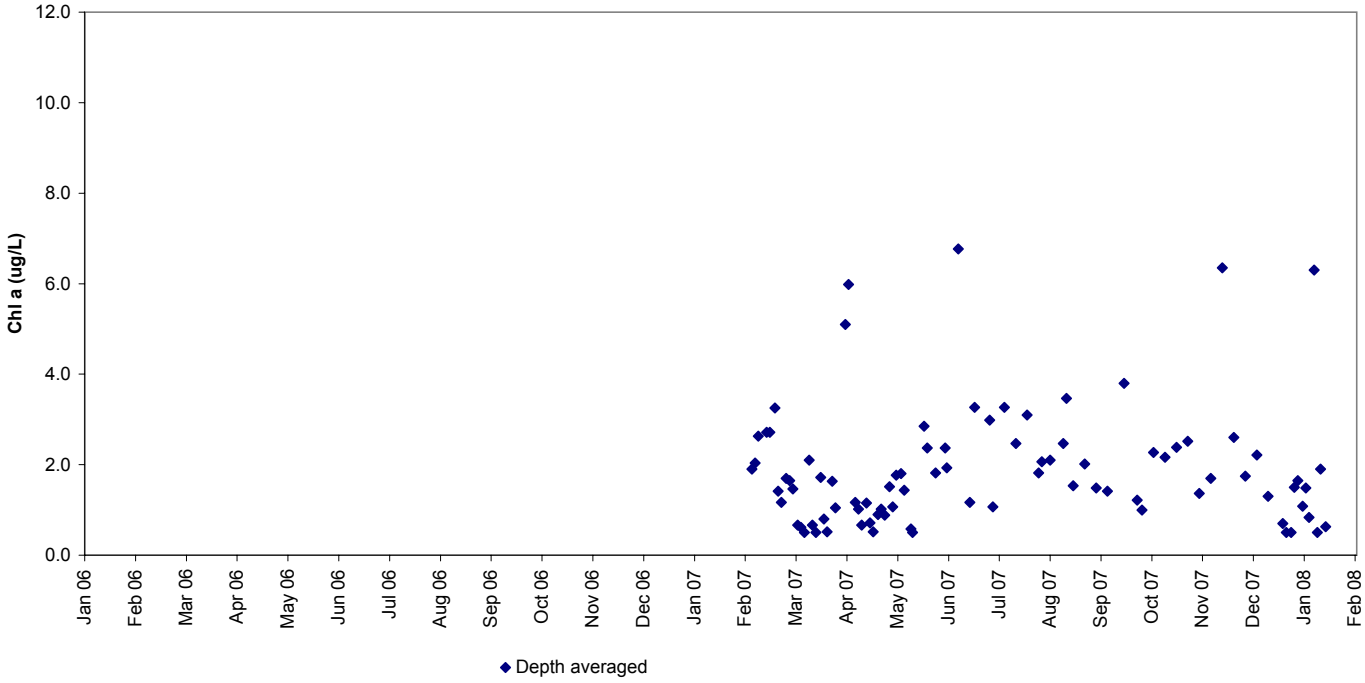
M_A : Total Inorganic Nitrogen



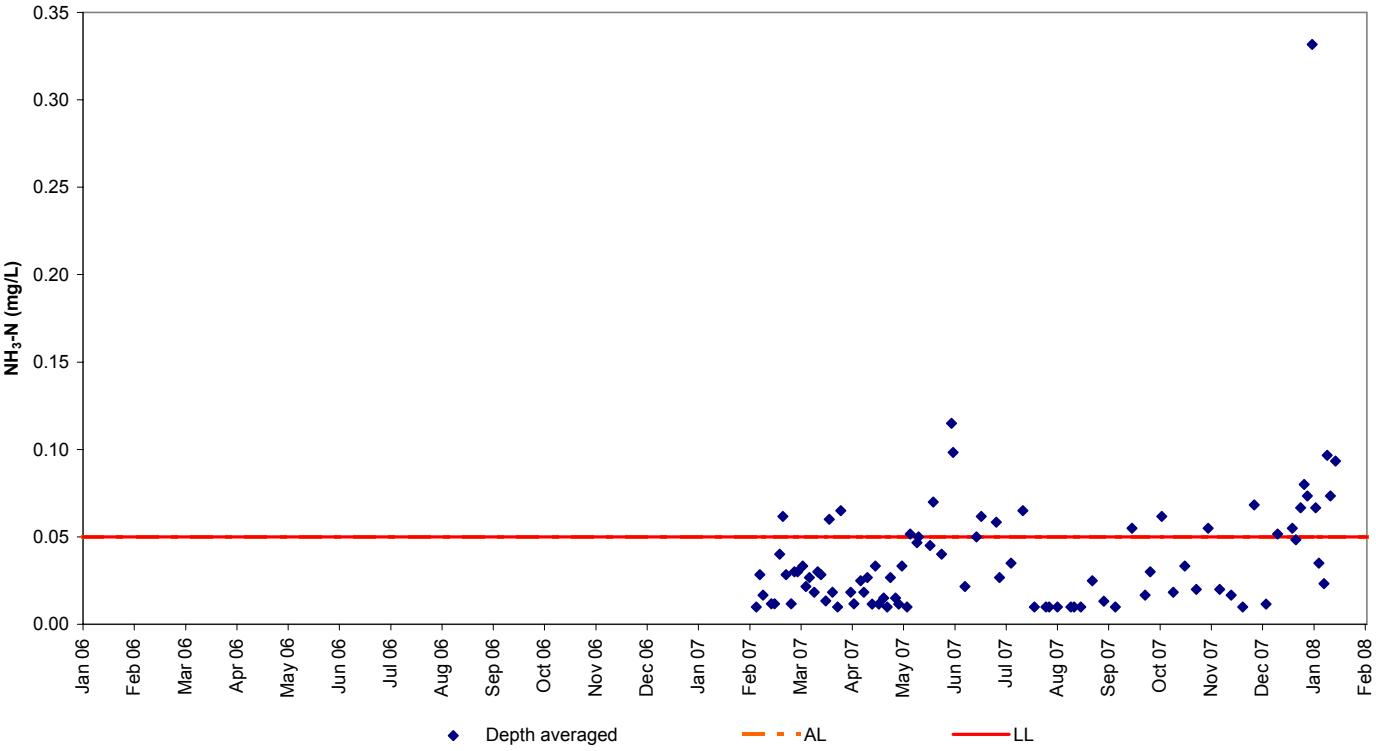
M_A : Total Phosphorus



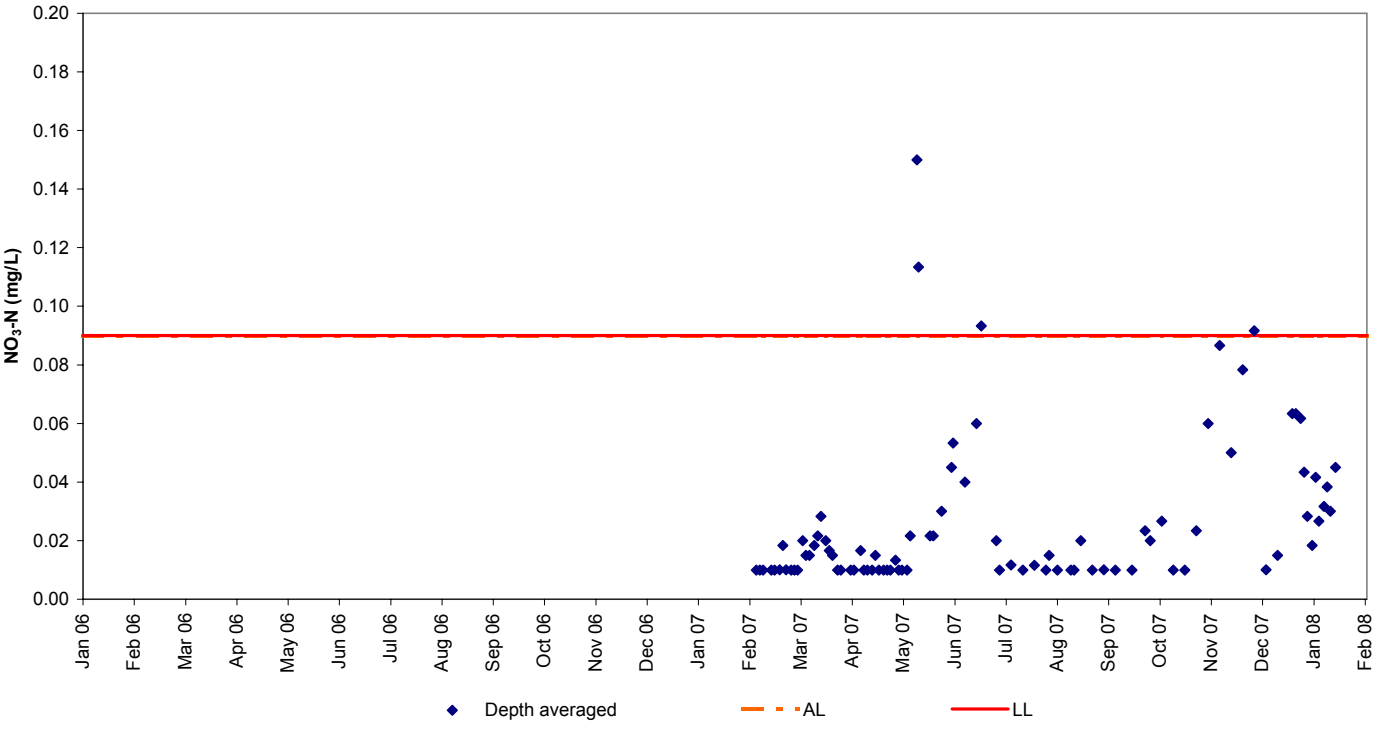
M_A : Chlorophyll a



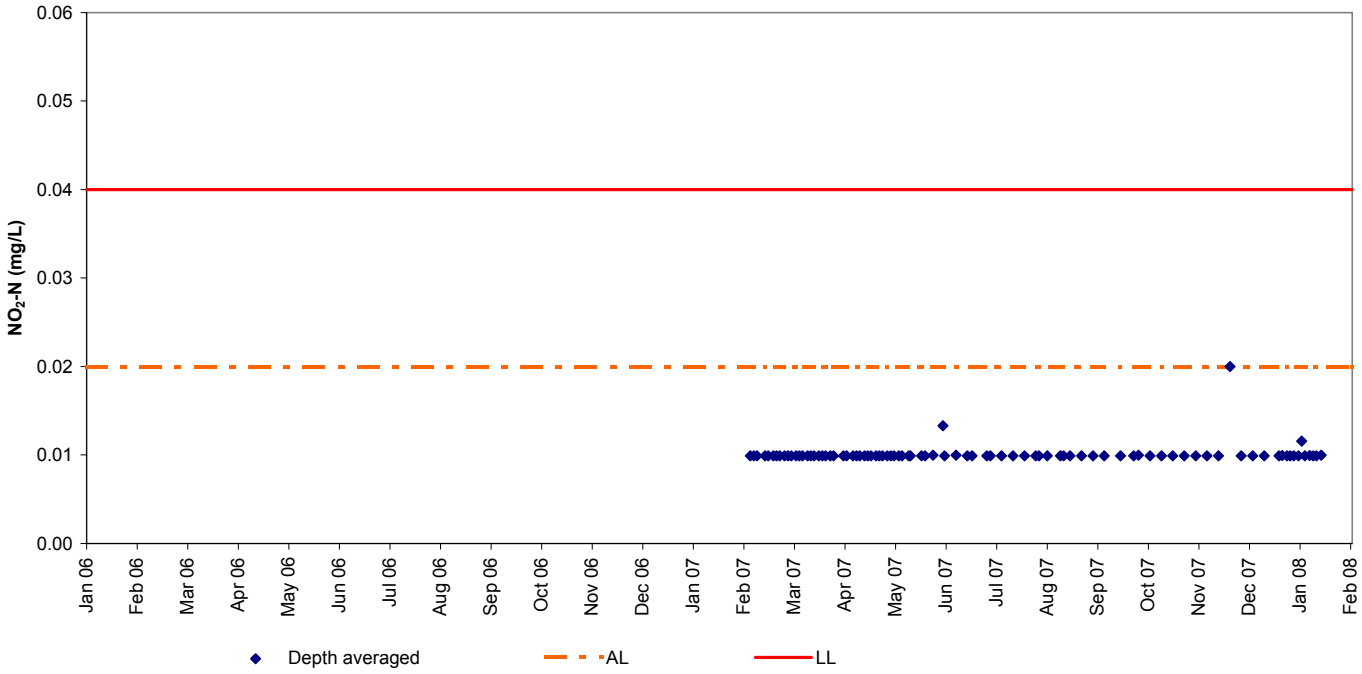
M_Marsh : Ammonia Nitrogen



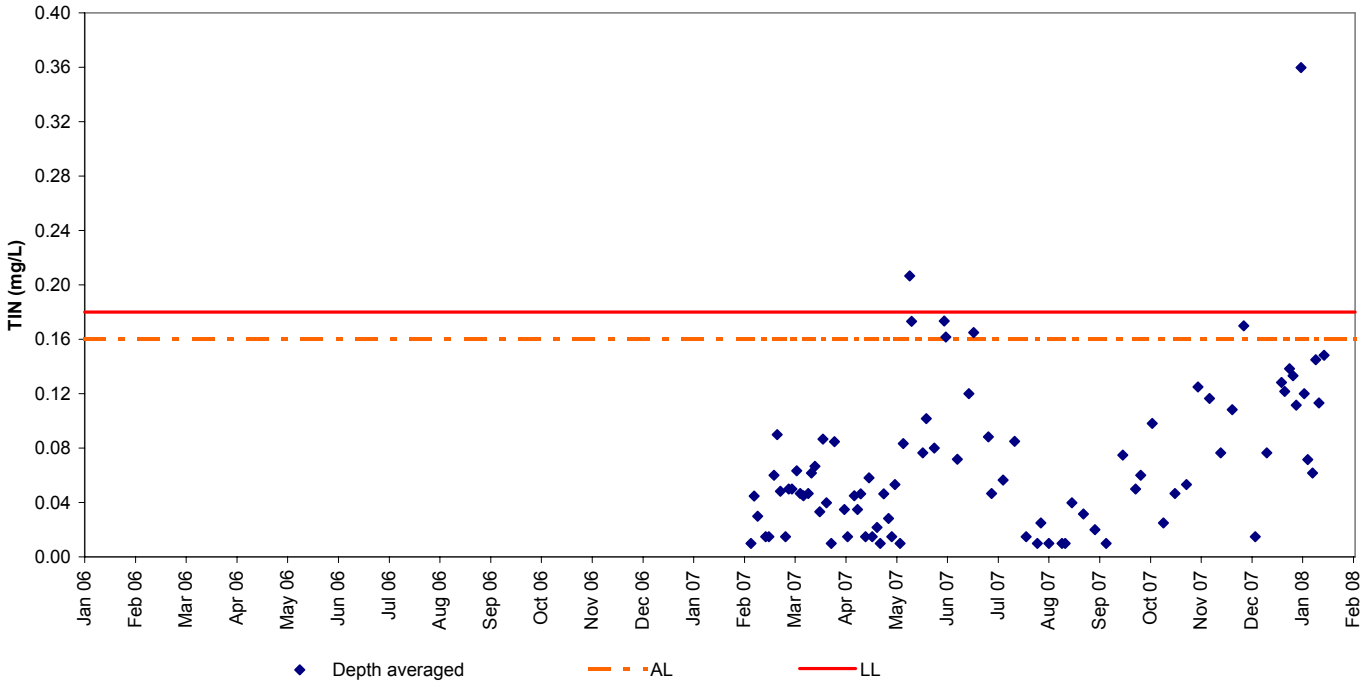
M_Marsh : Nitrate Nitrogen



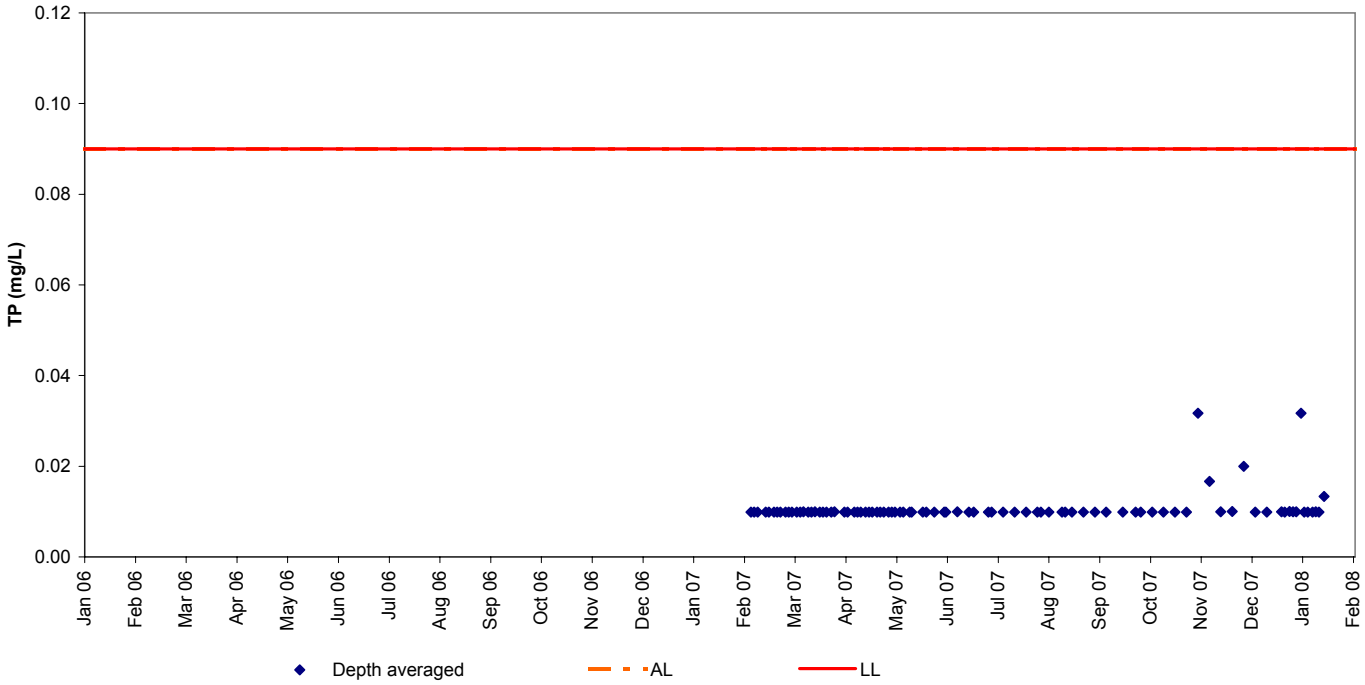
M_Marsh : Nitrite Nitrogen



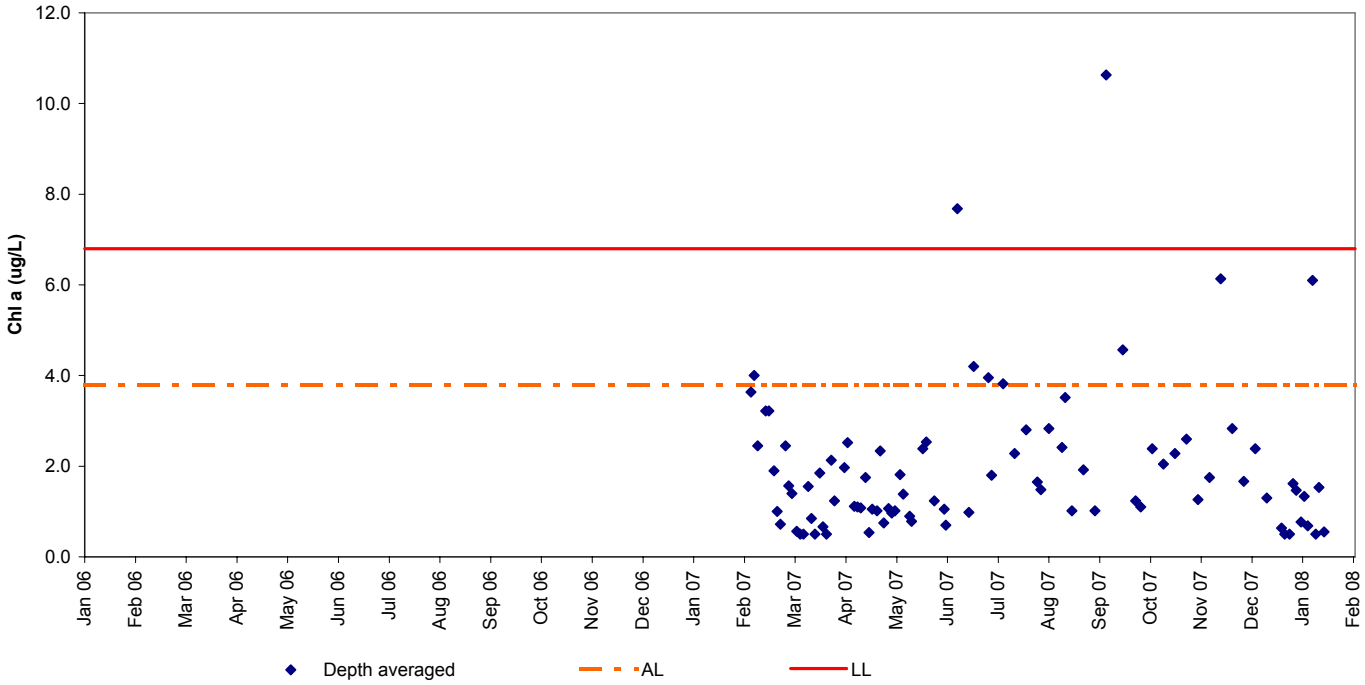
M_Marsh : Total Inorganic Nitrogen



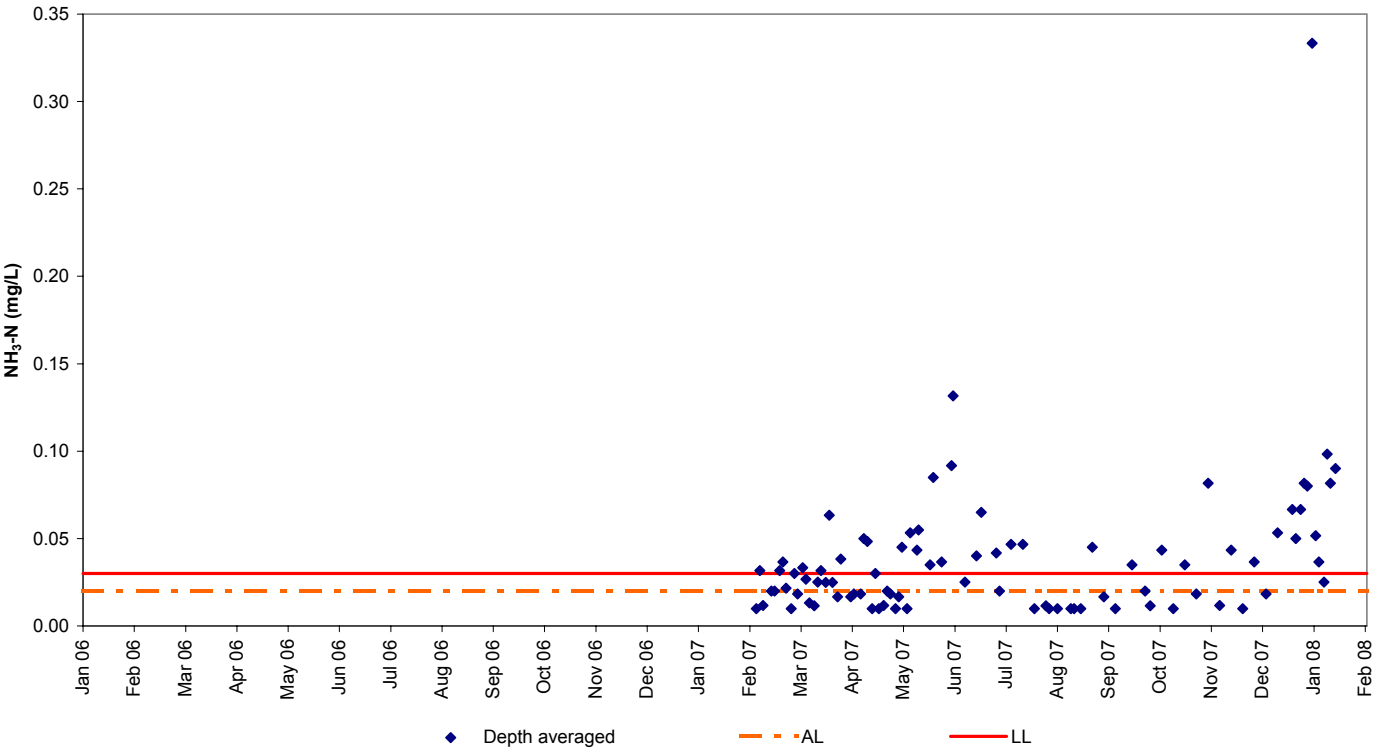
M_Marsh : Total Phosphorus



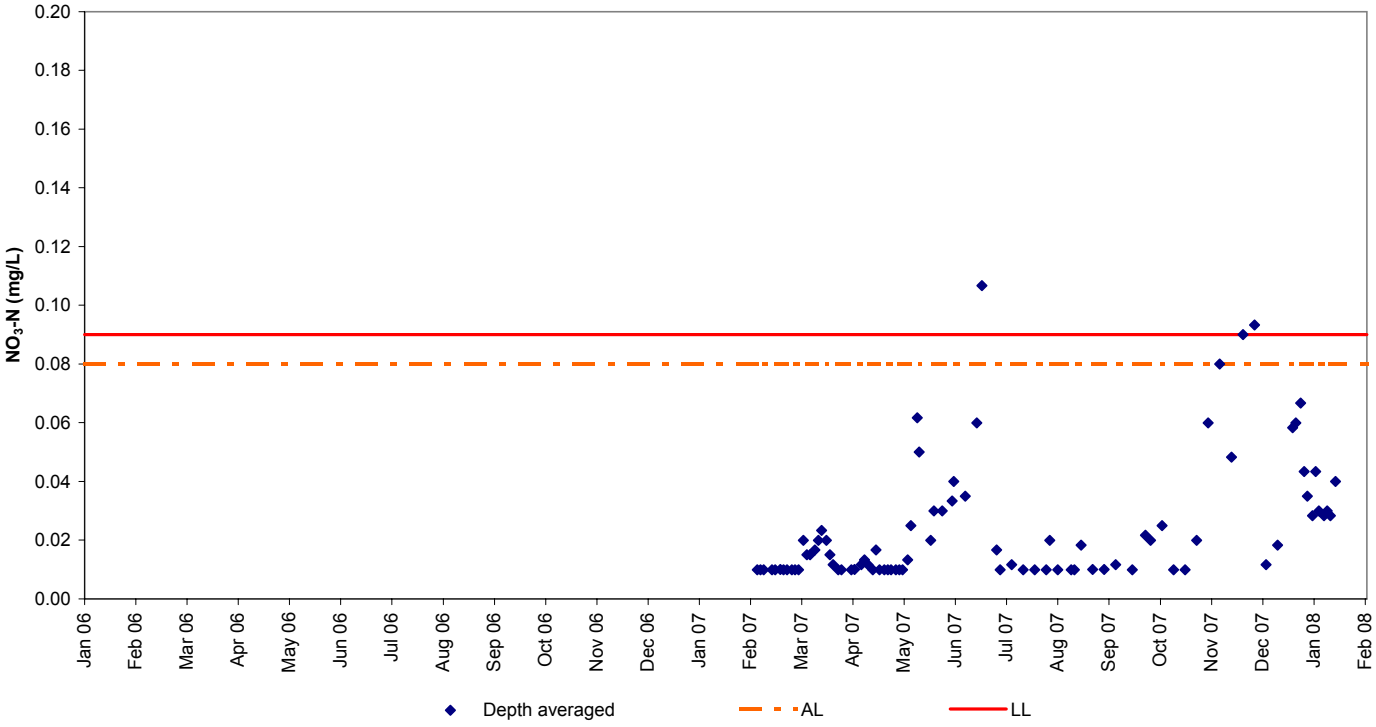
M_Marsh : Chlorophyll a



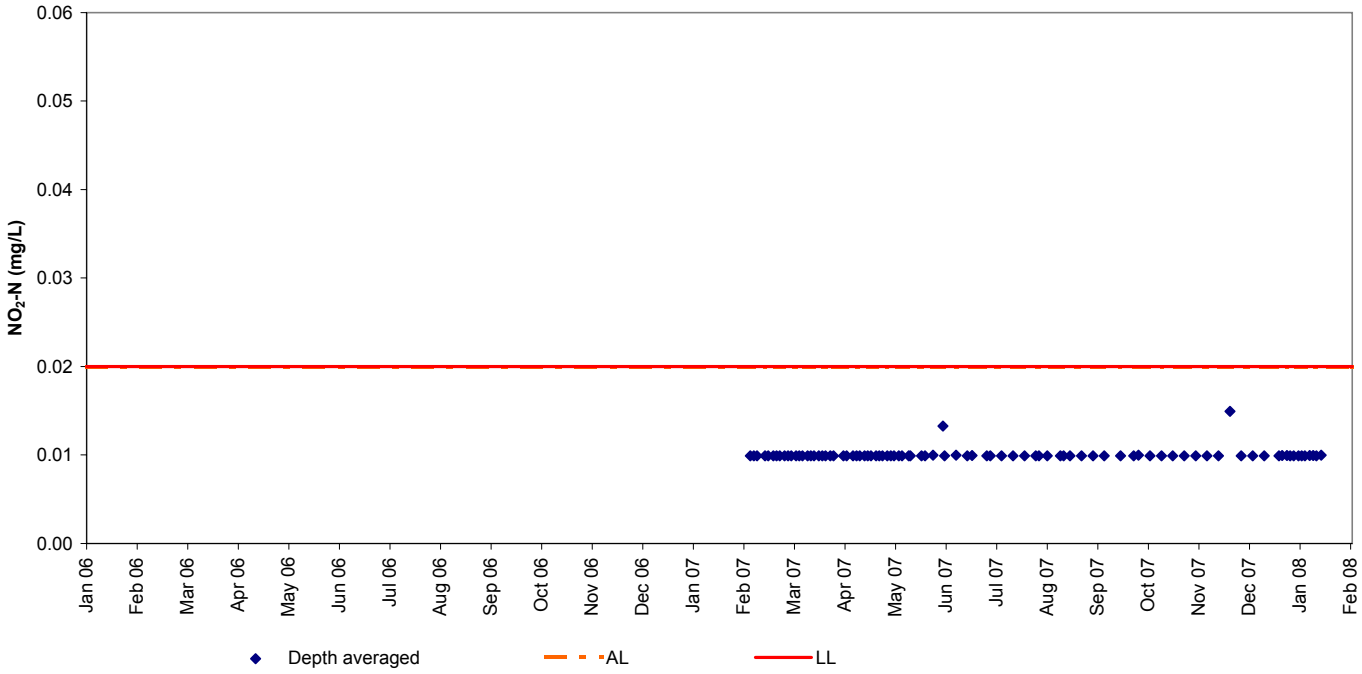
TTC : Ammonia Nitrogen



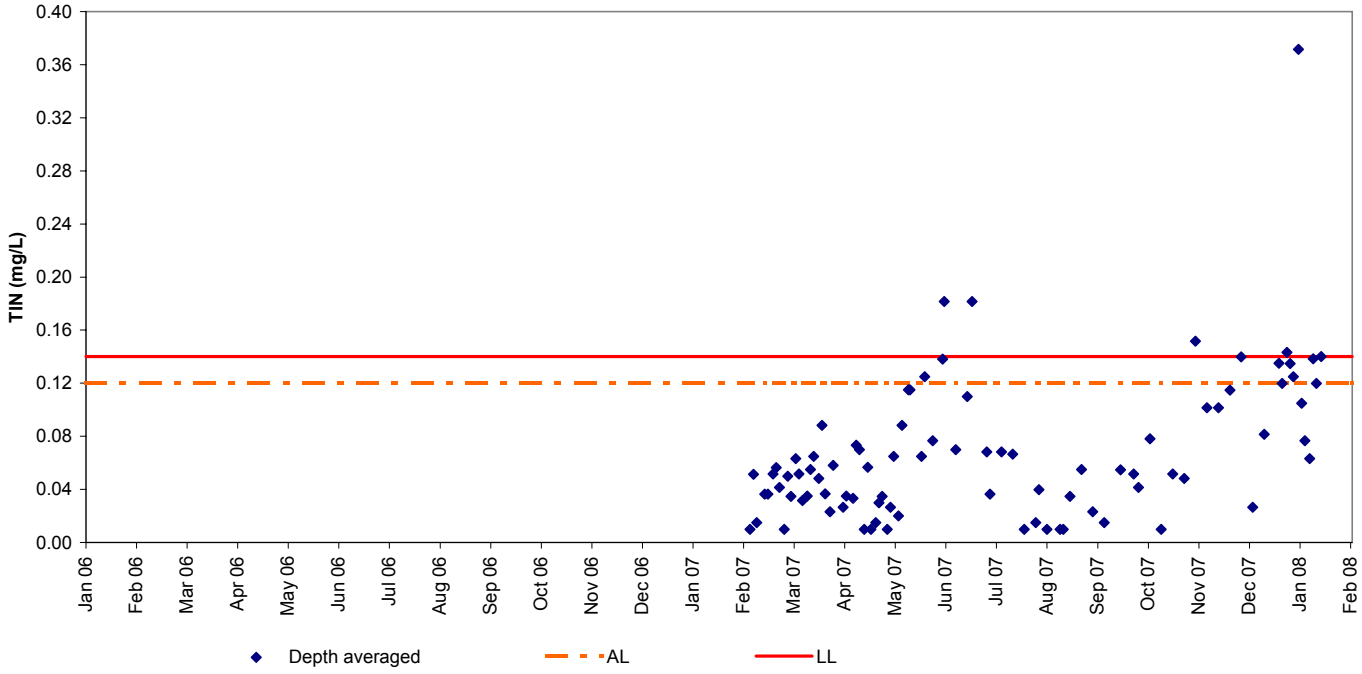
TTC : Nitrate Nitrogen



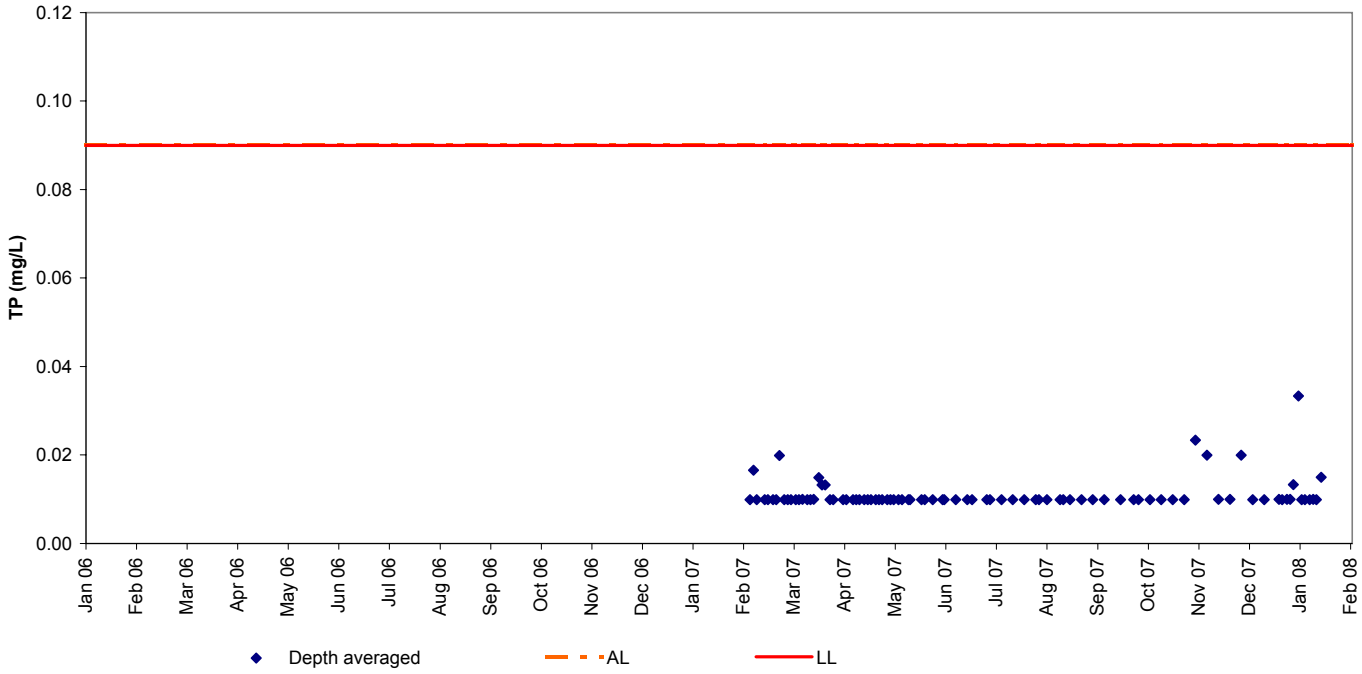
TTC : Nitrite Nitrogen



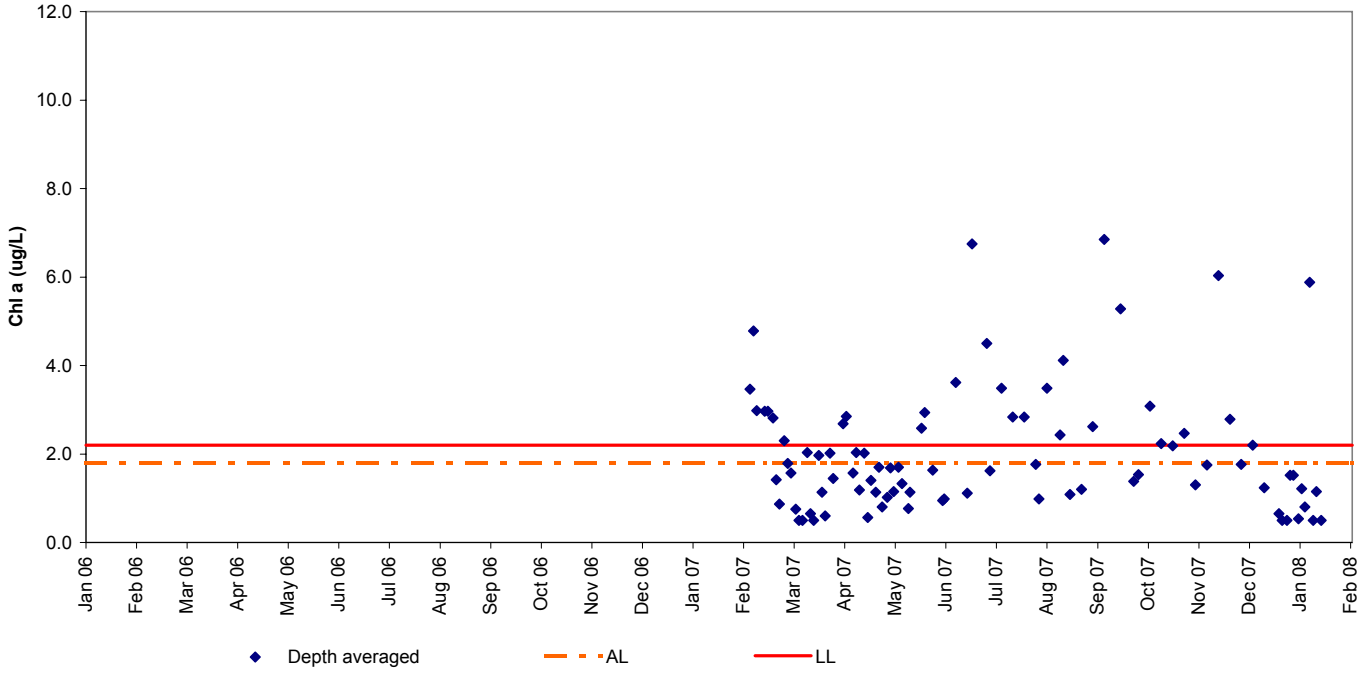
TTC : Total Inorganic Nitrogen



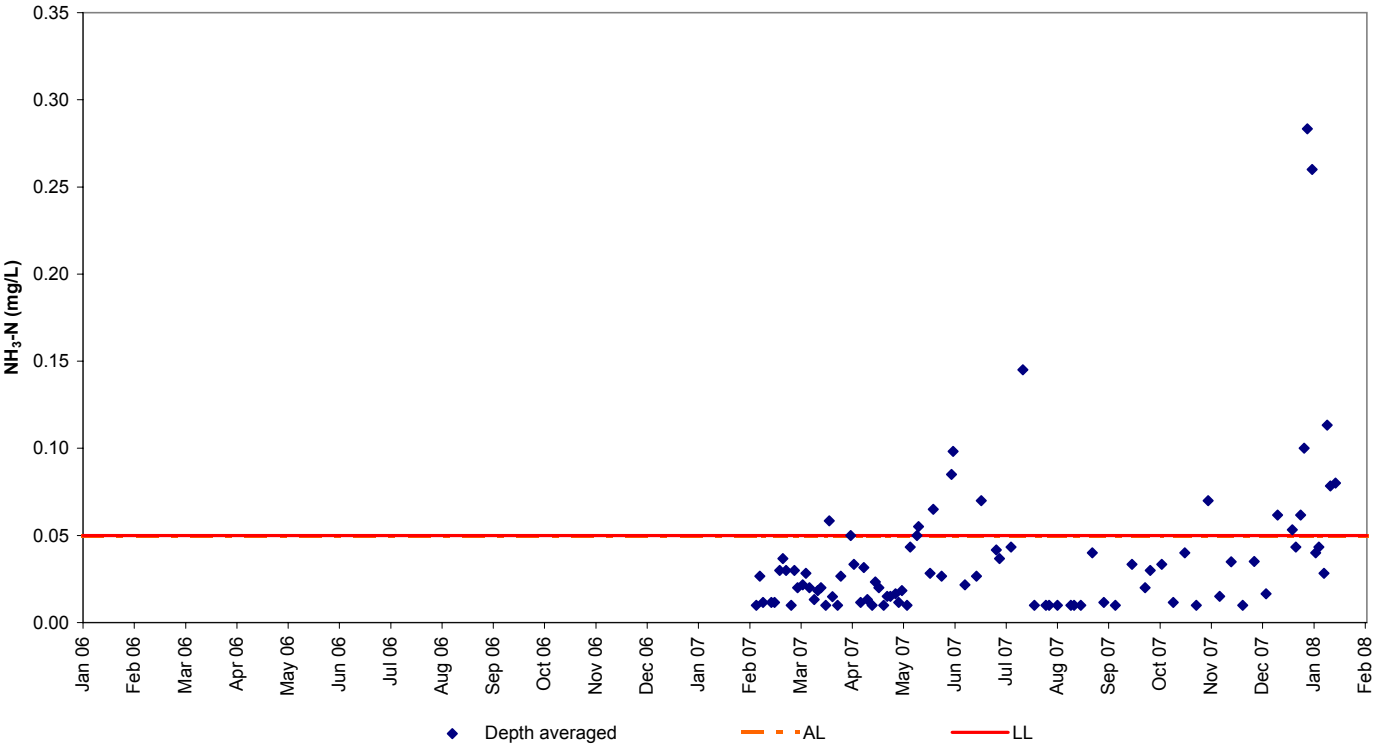
TTC : Total Phosphorus



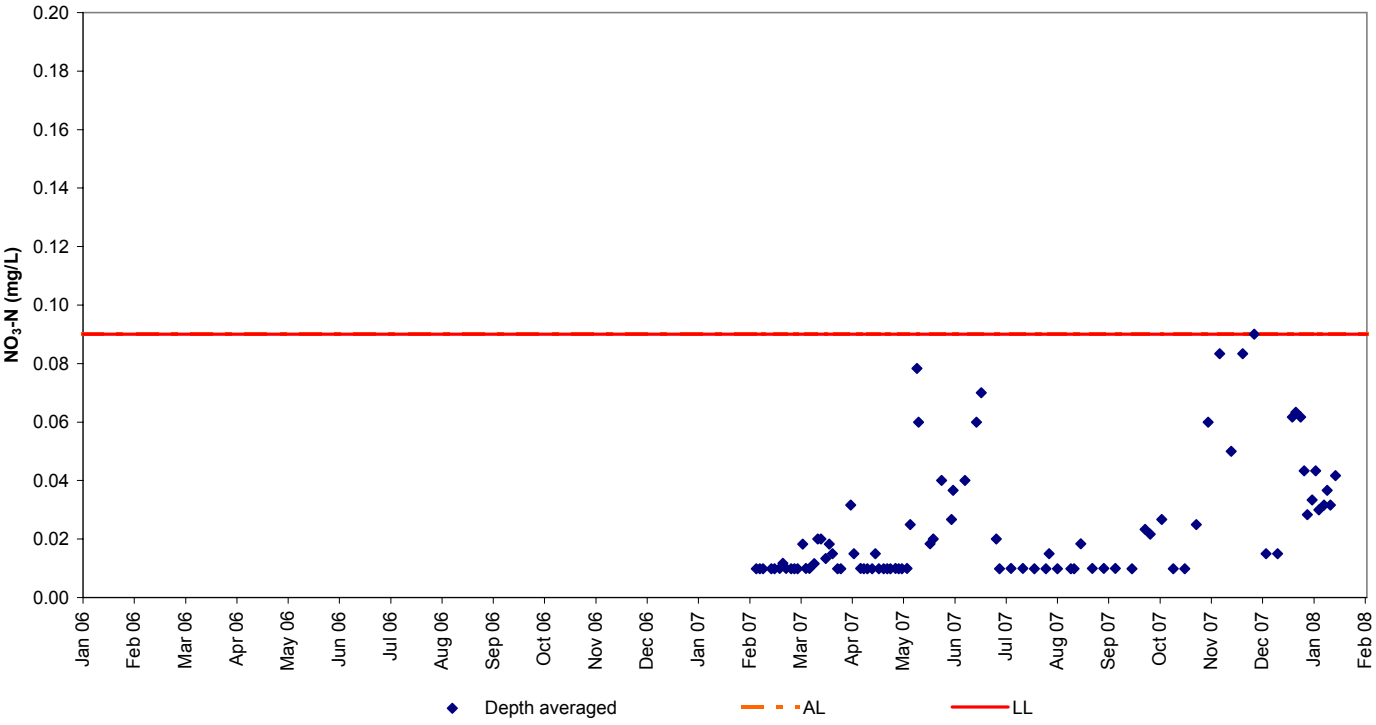
TTC : Chlorophyll a



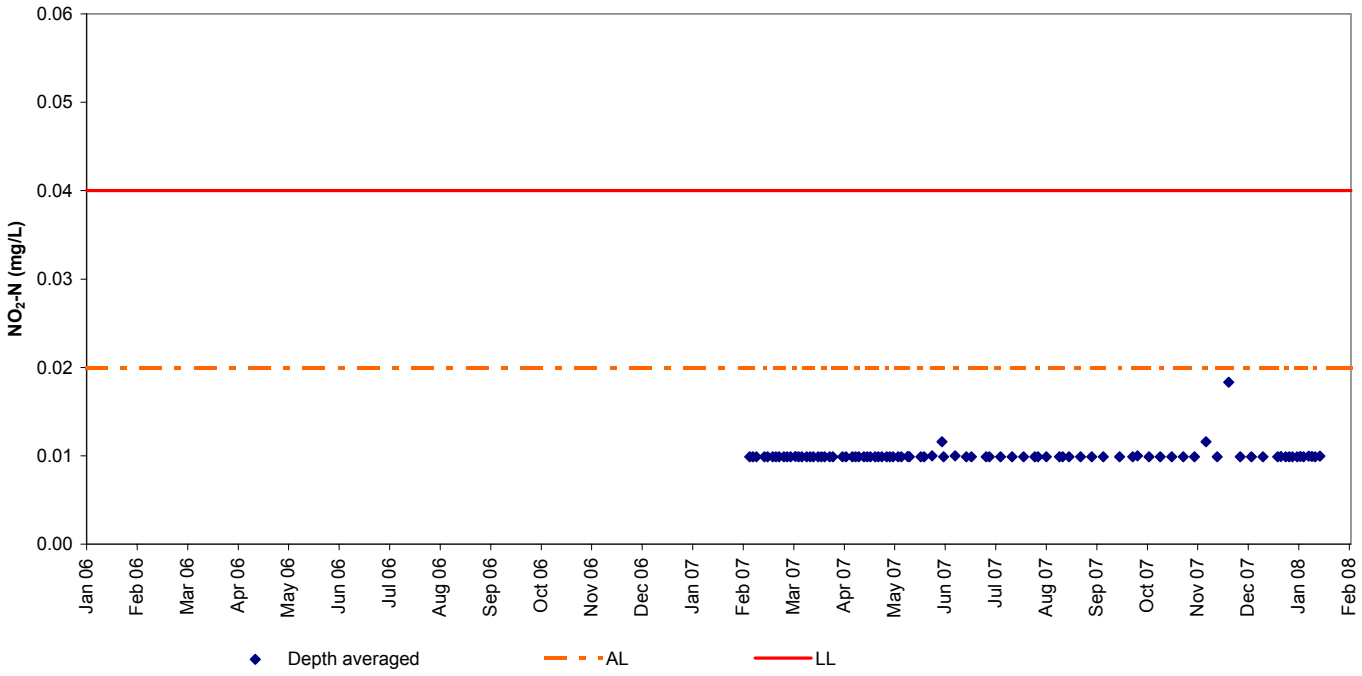
M_BP : Ammonia Nitrogen



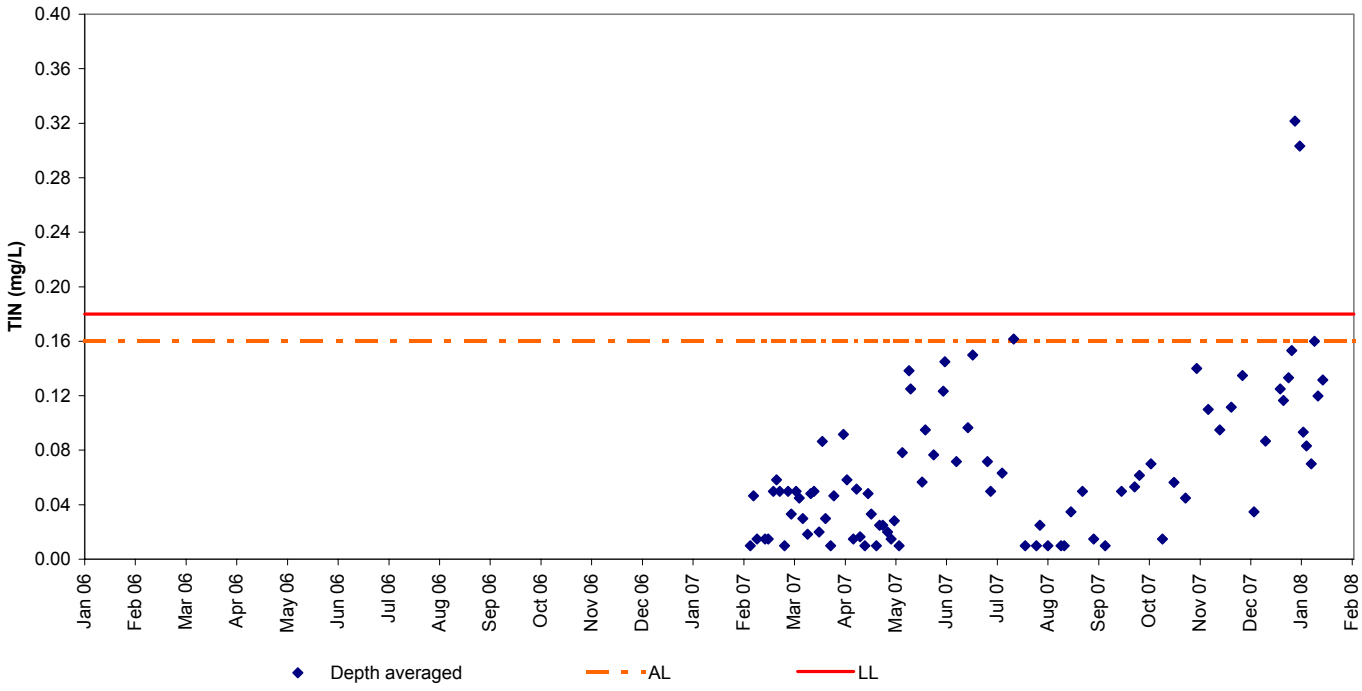
M_BP : Nitrate Nitrogen



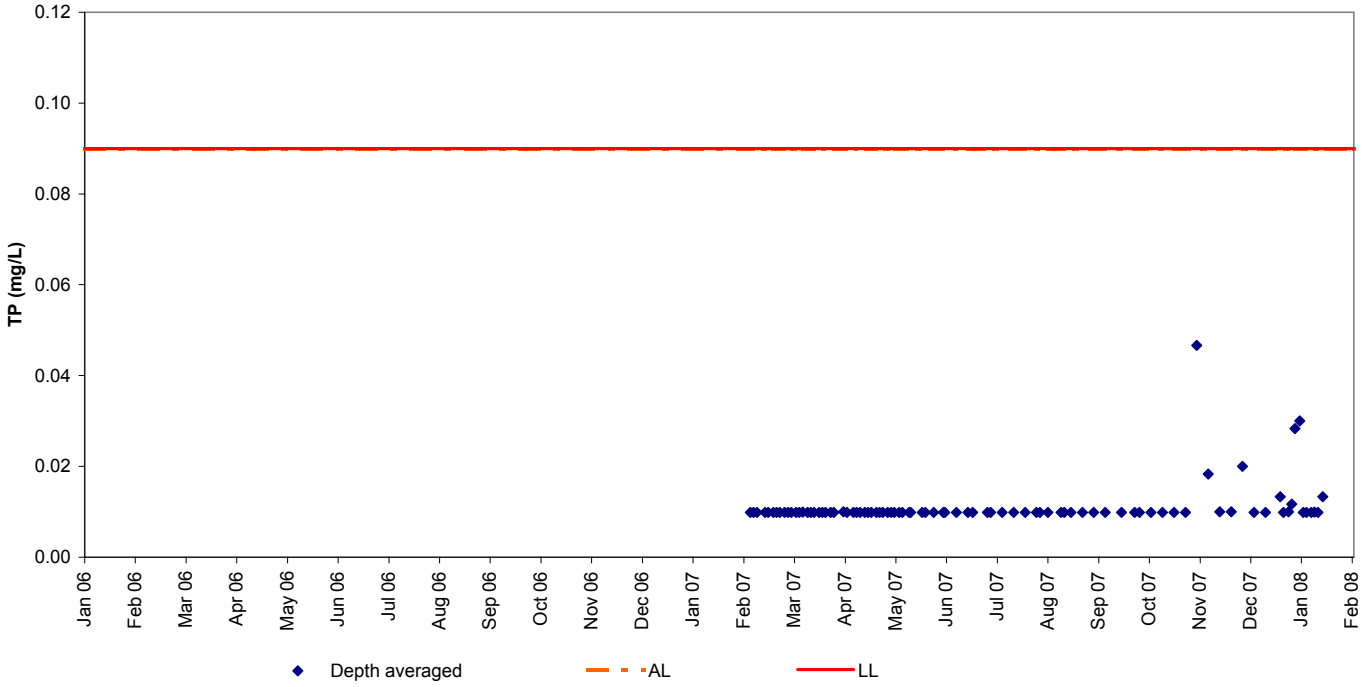
M_BP : Nitrite Nitrogen



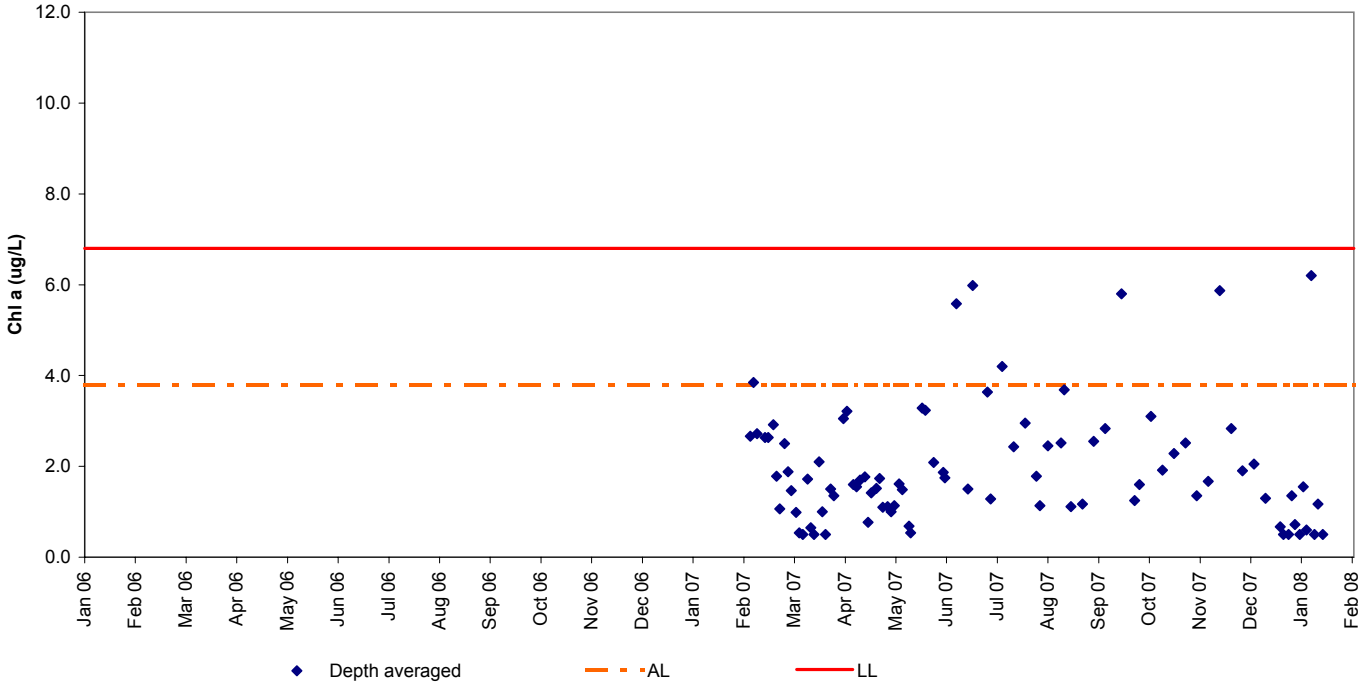
M_BP : Total Inorganic Nitrogen



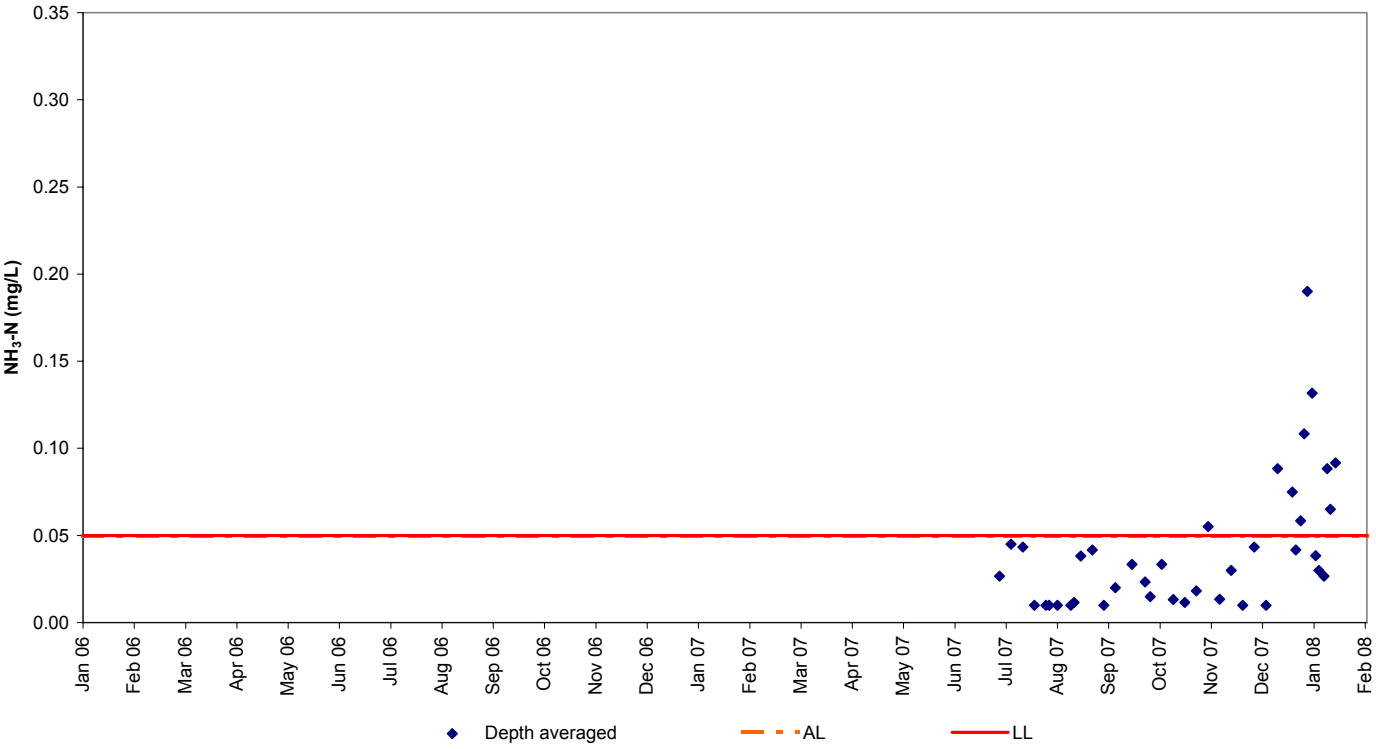
M_BP : Total Phosphorus



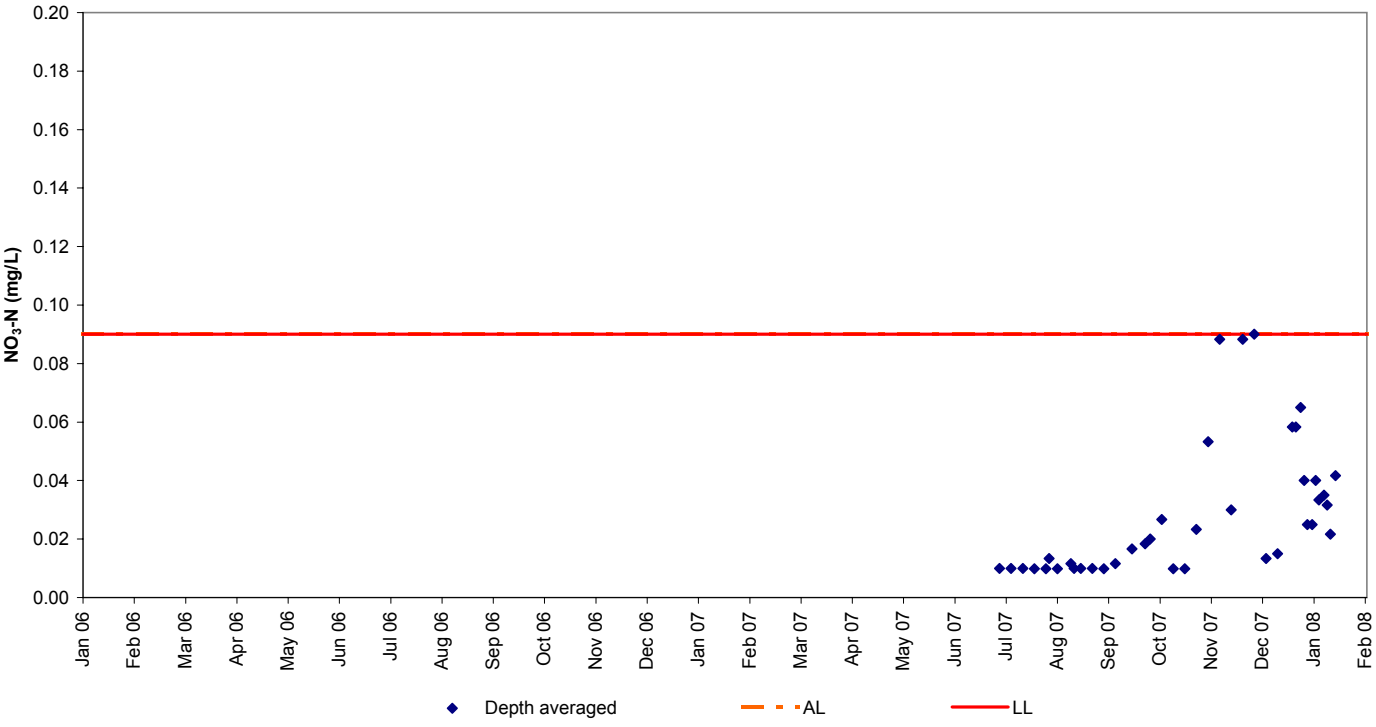
M_BP : Chlorophyll a



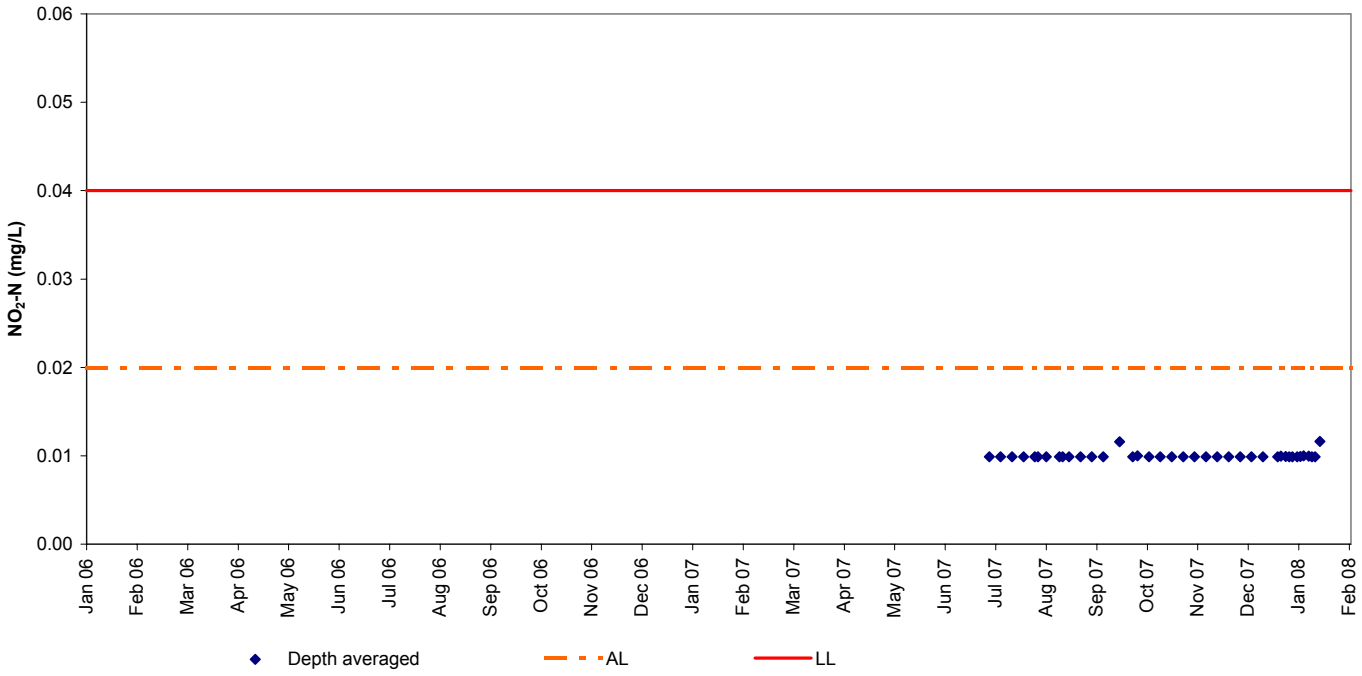
M_Coral : Ammonia Nitrogen



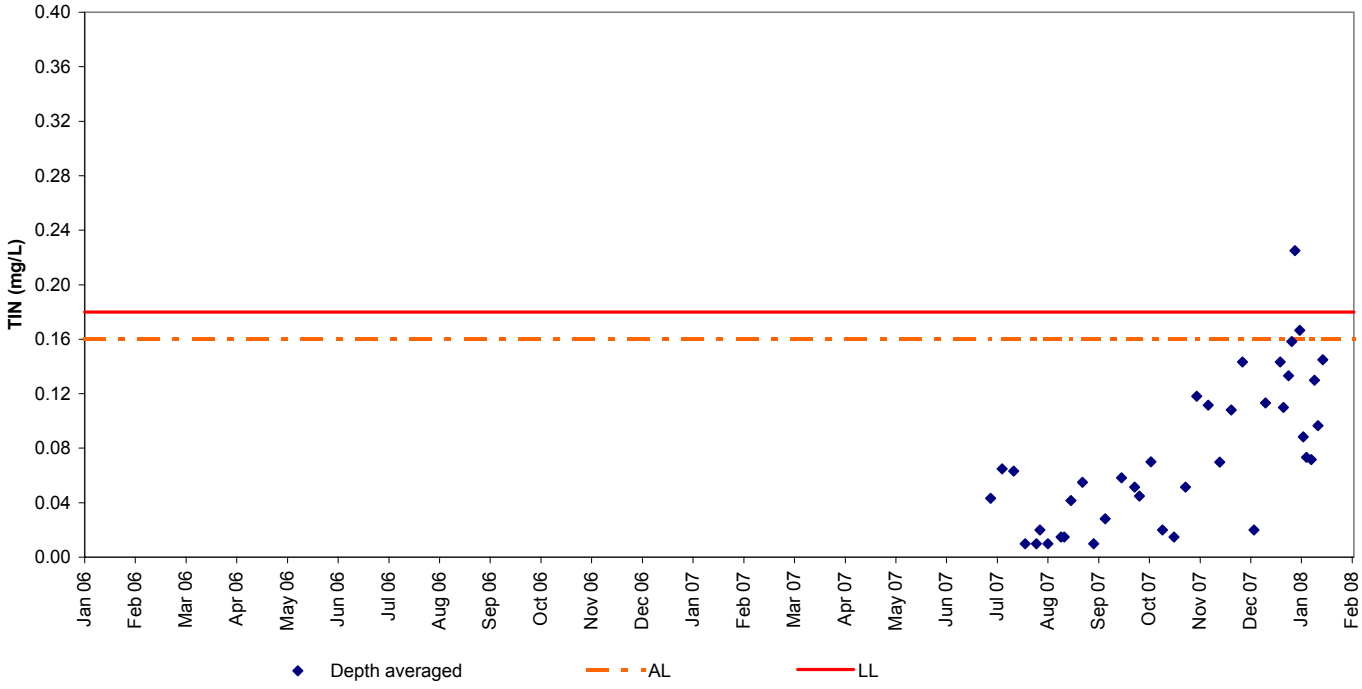
M_Coral : Nitrate Nitrogen



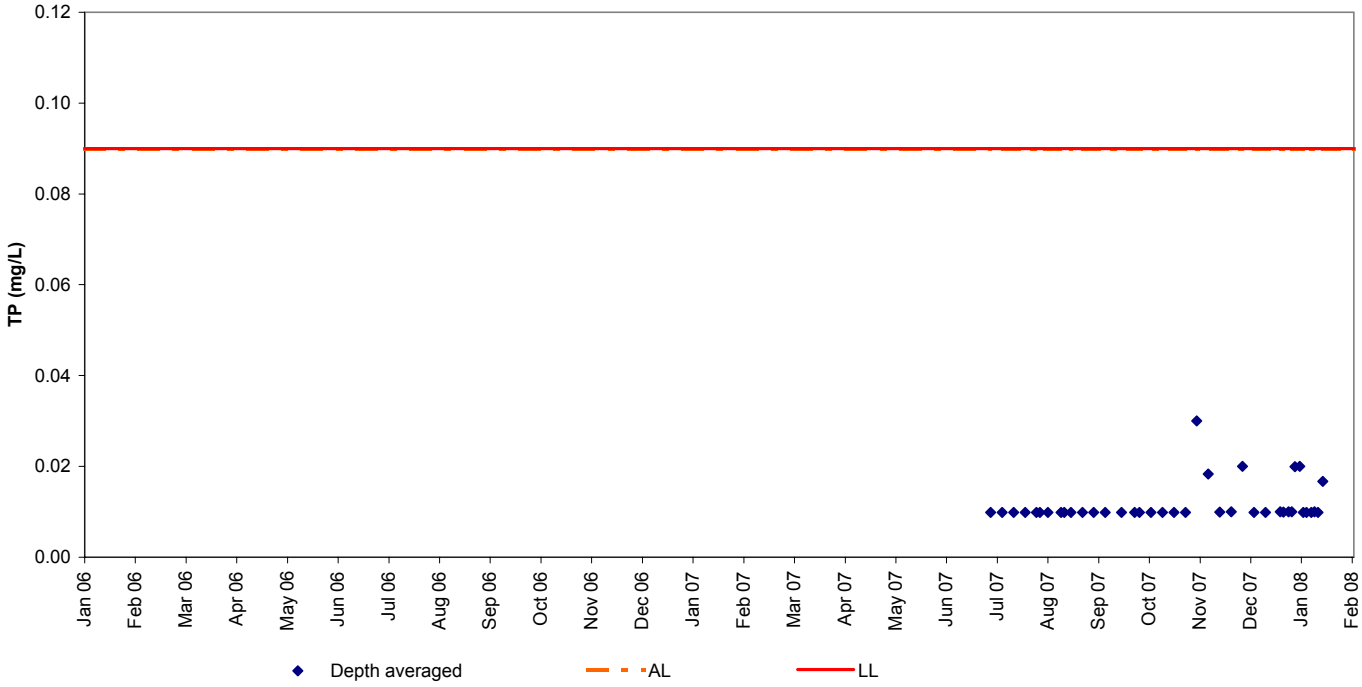
M_Coral : Nitrite Nitrogen



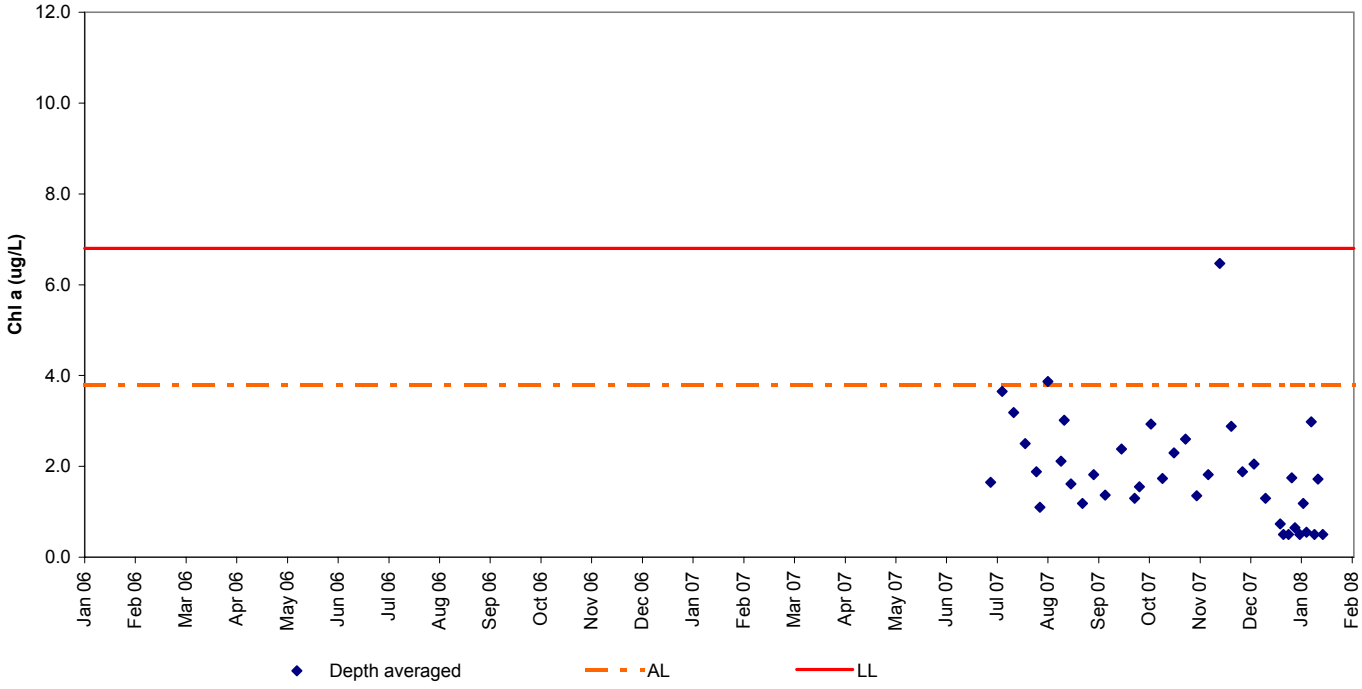
M_Coral : Total Inorganic Nitrogen



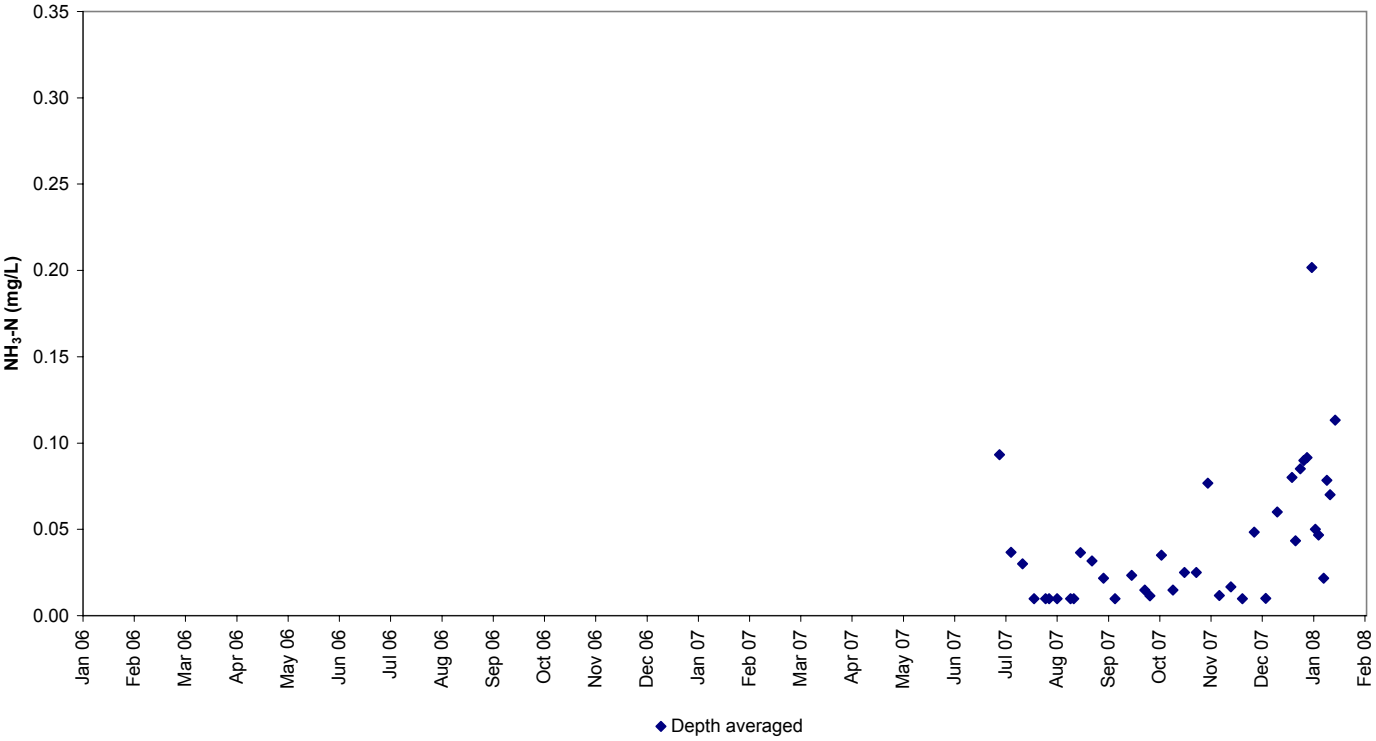
M_Coral : Total Phosphorus



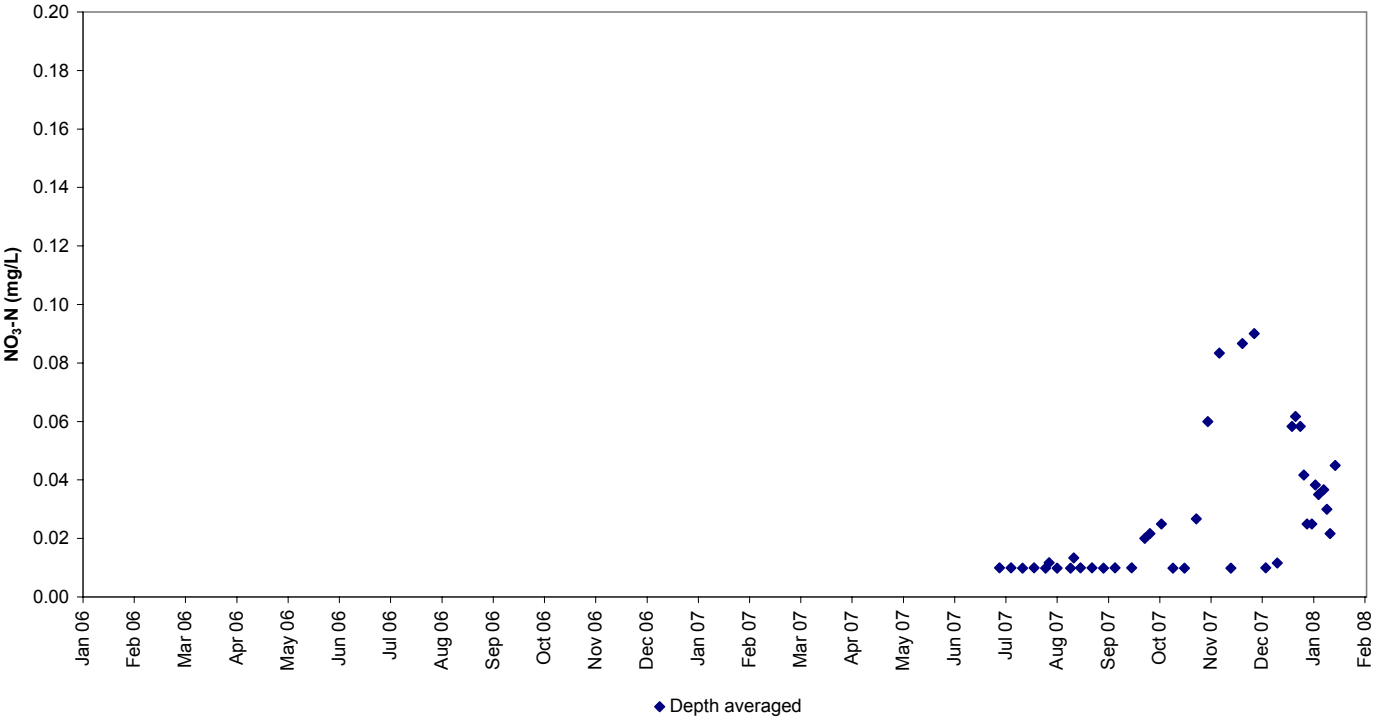
M_Coral : Chlorophyll a



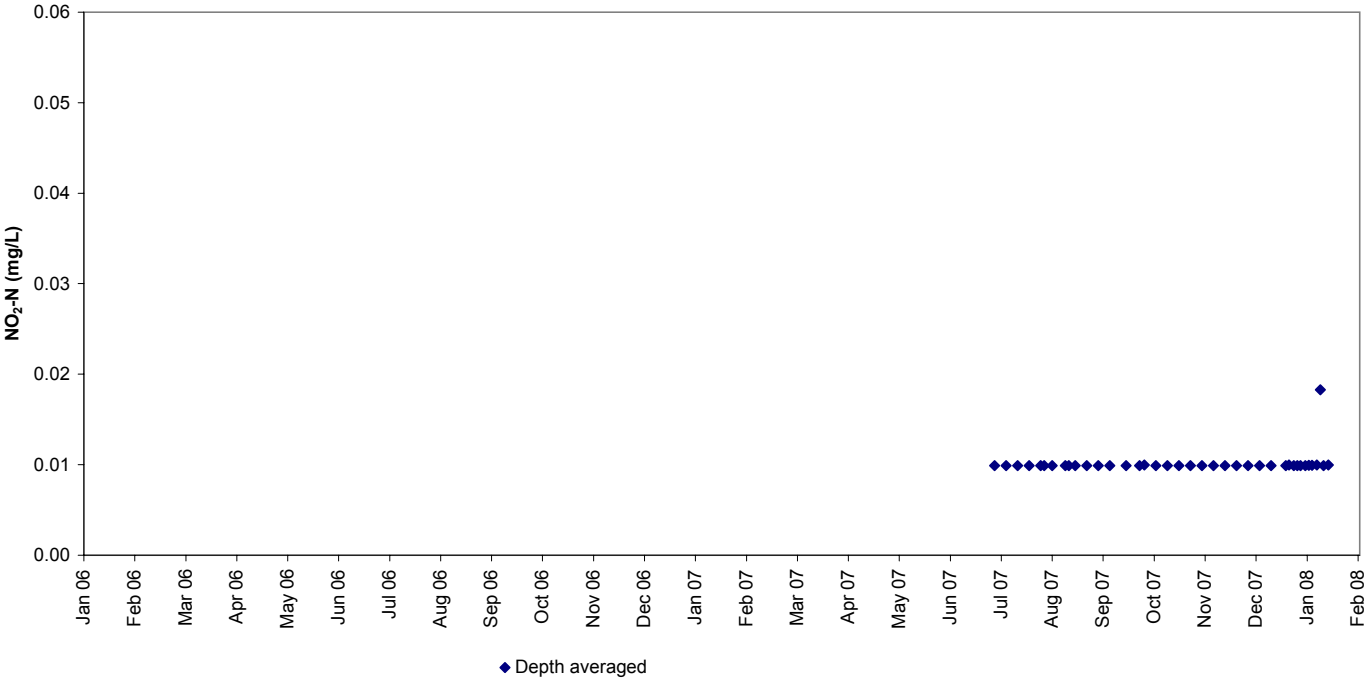
M_B : Ammonia Nitrogen



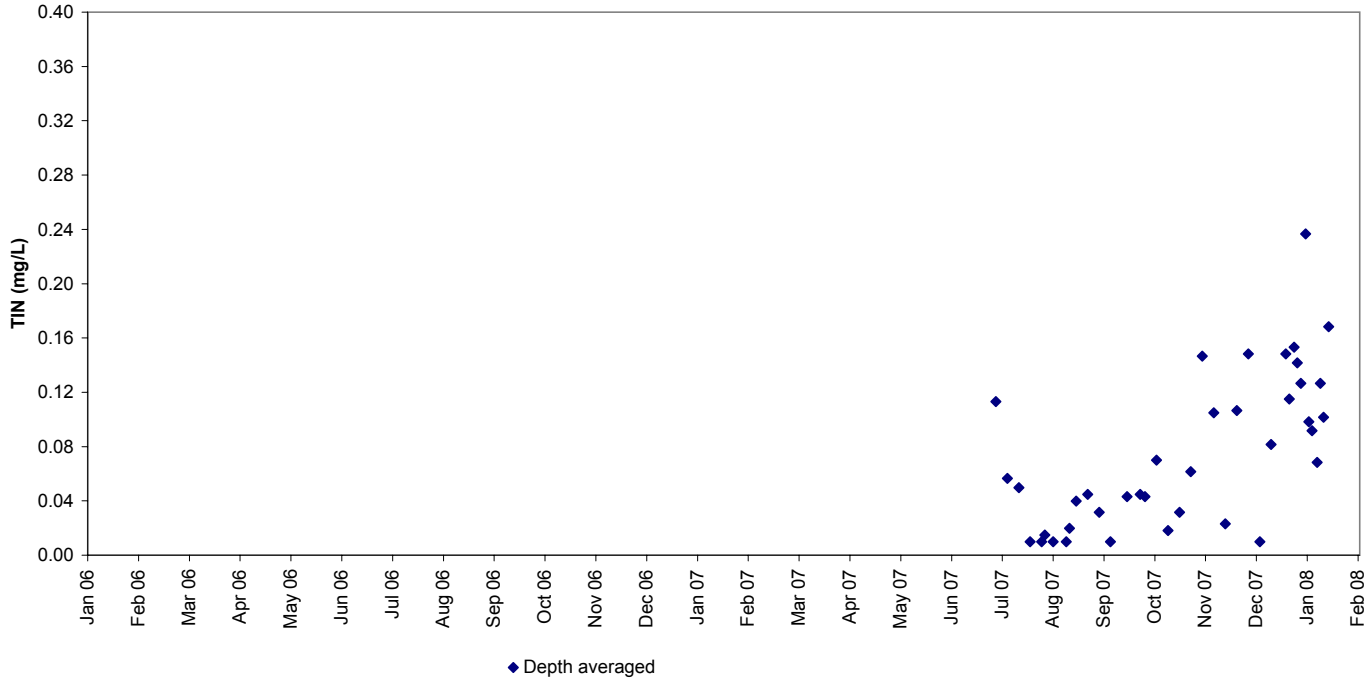
M_B : Nitrate Nitrogen



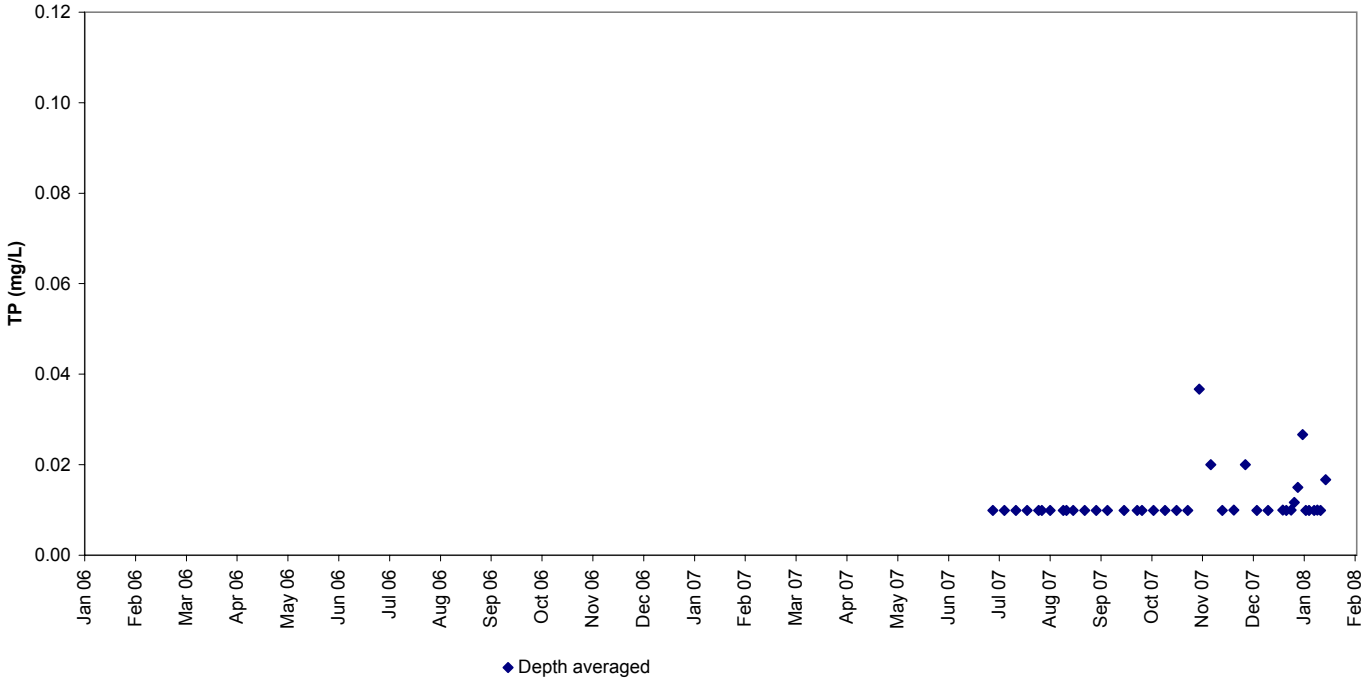
M_B : Nitrite Nitrogen



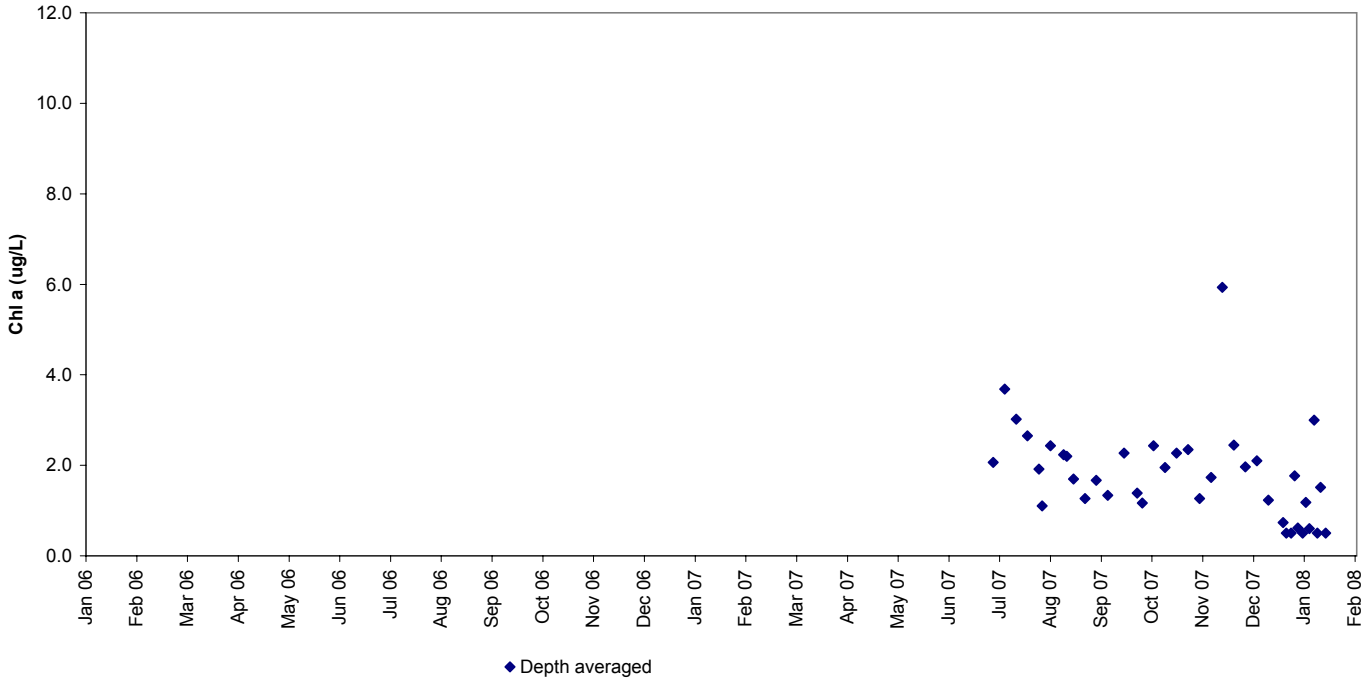
M_B : Total Inorganic Nitrogen



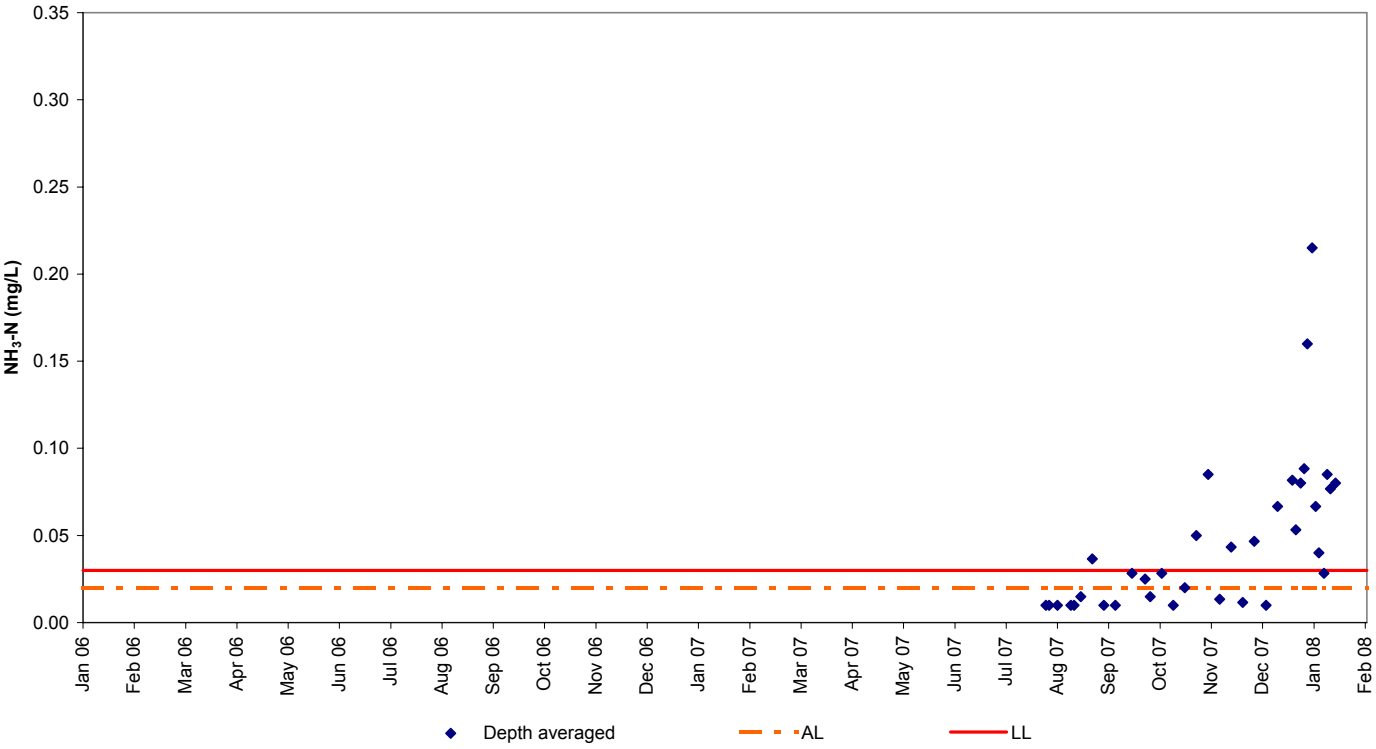
M_B : Total Phosphorus



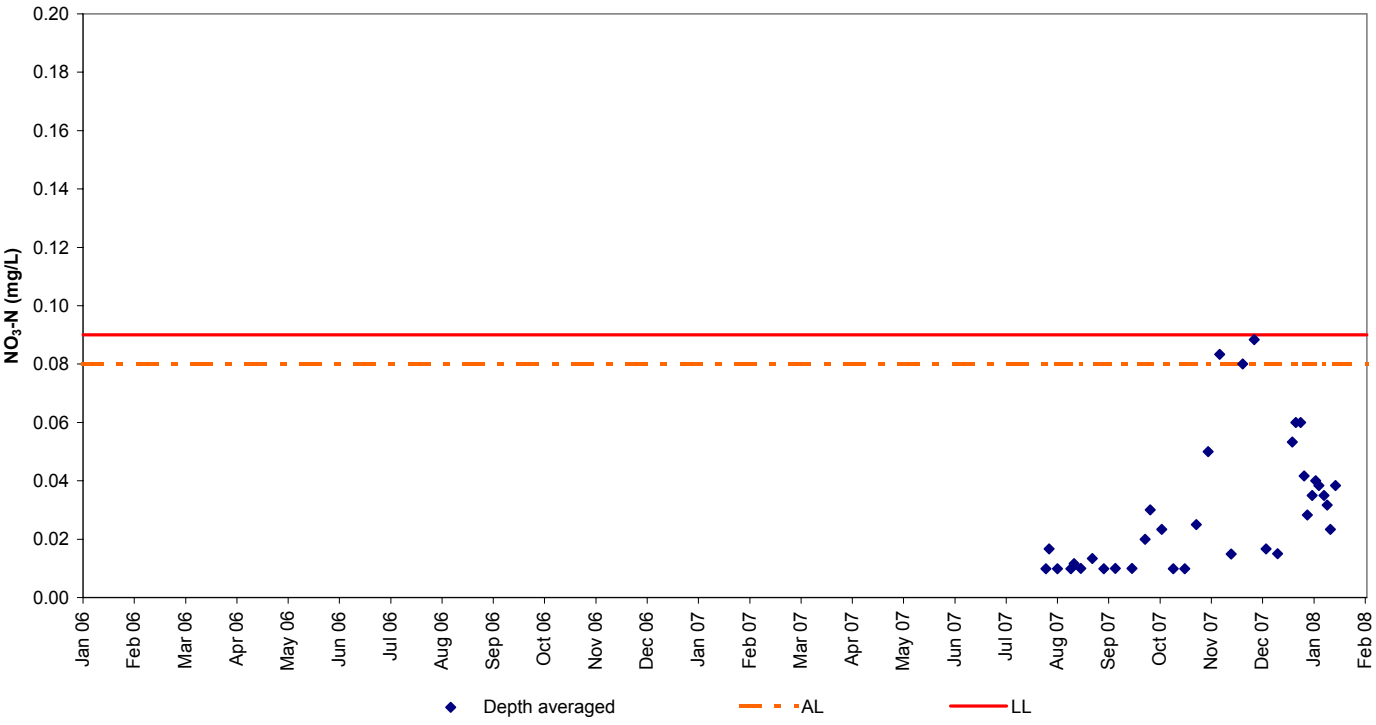
M_B : Chlorophyll a



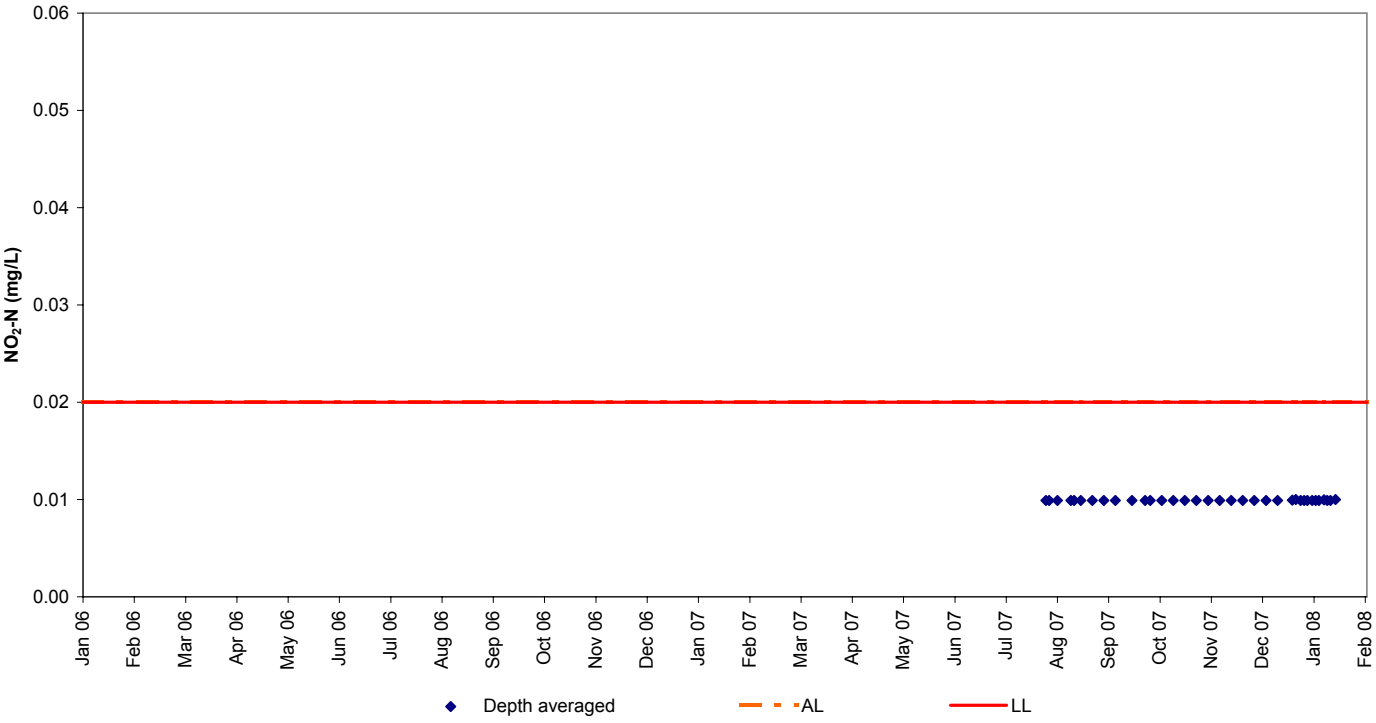
KS : Ammonia Nitrogen



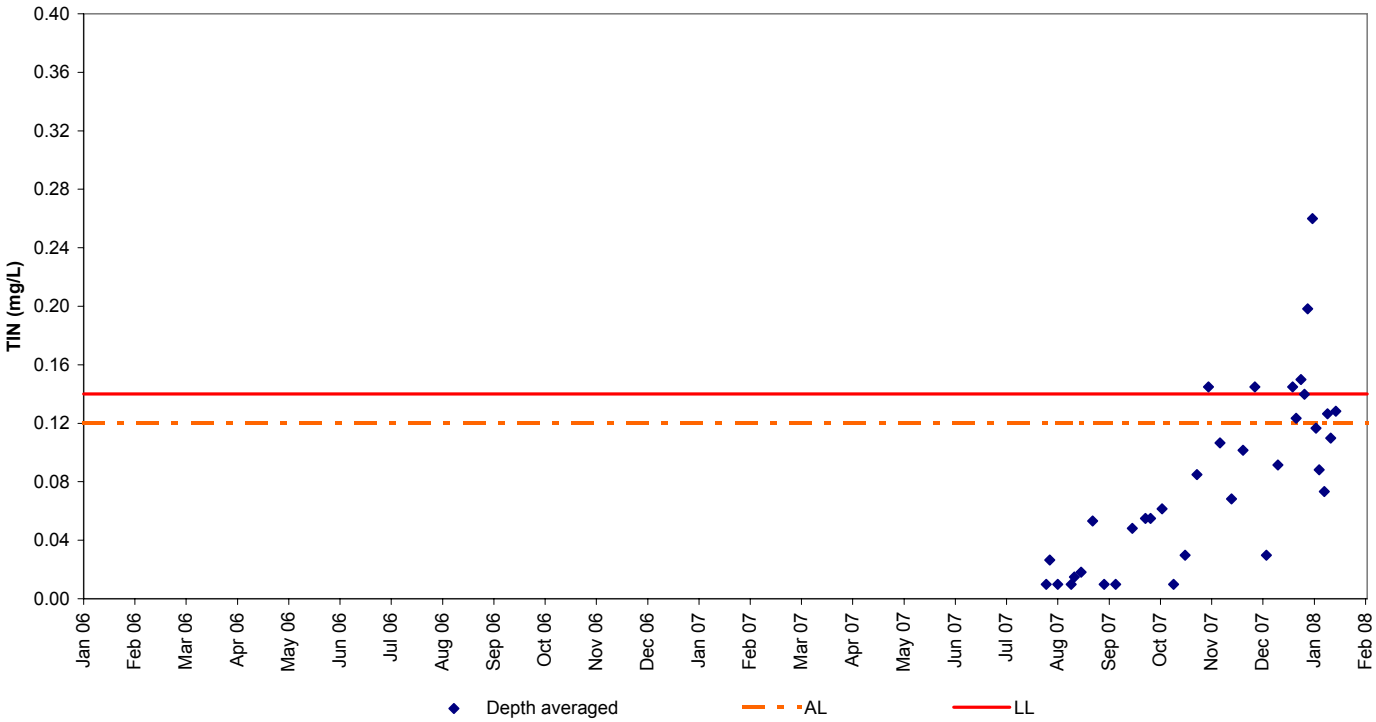
KS : Nitrate Nitrogen



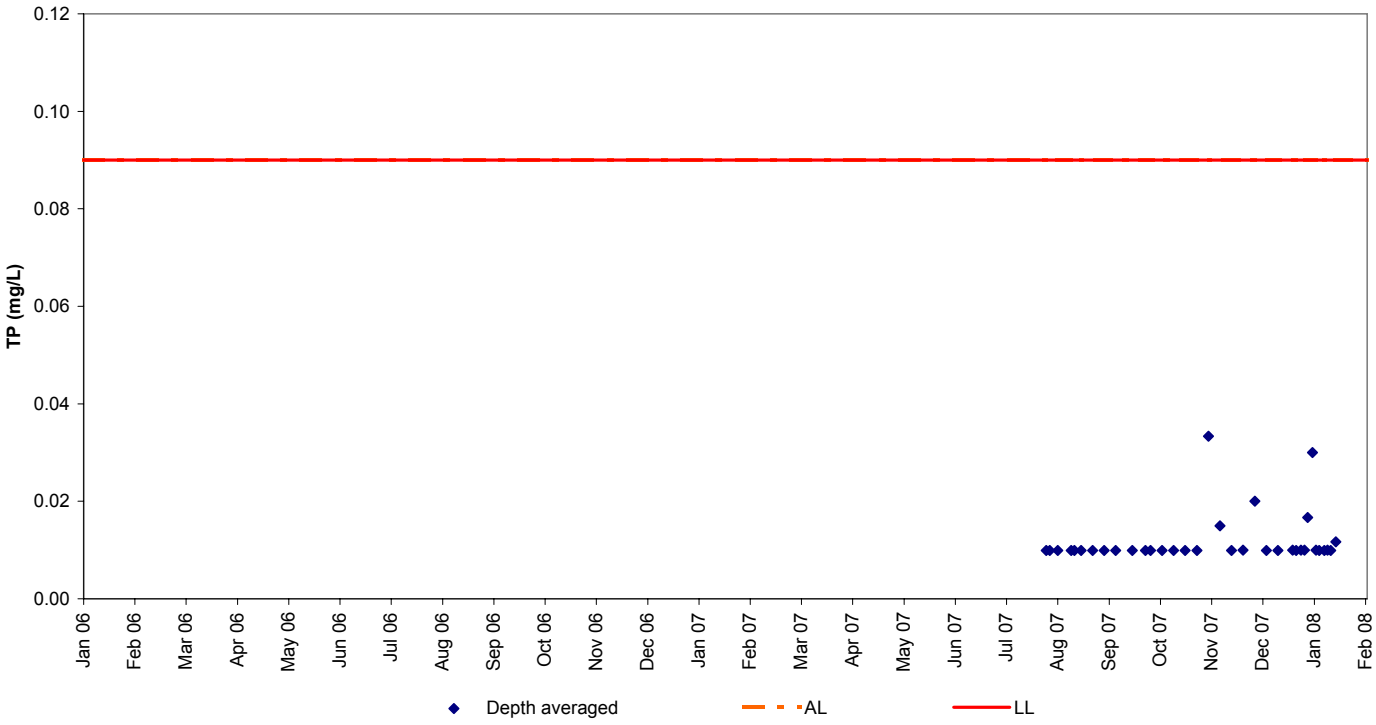
KS : Nitrite Nitrogen



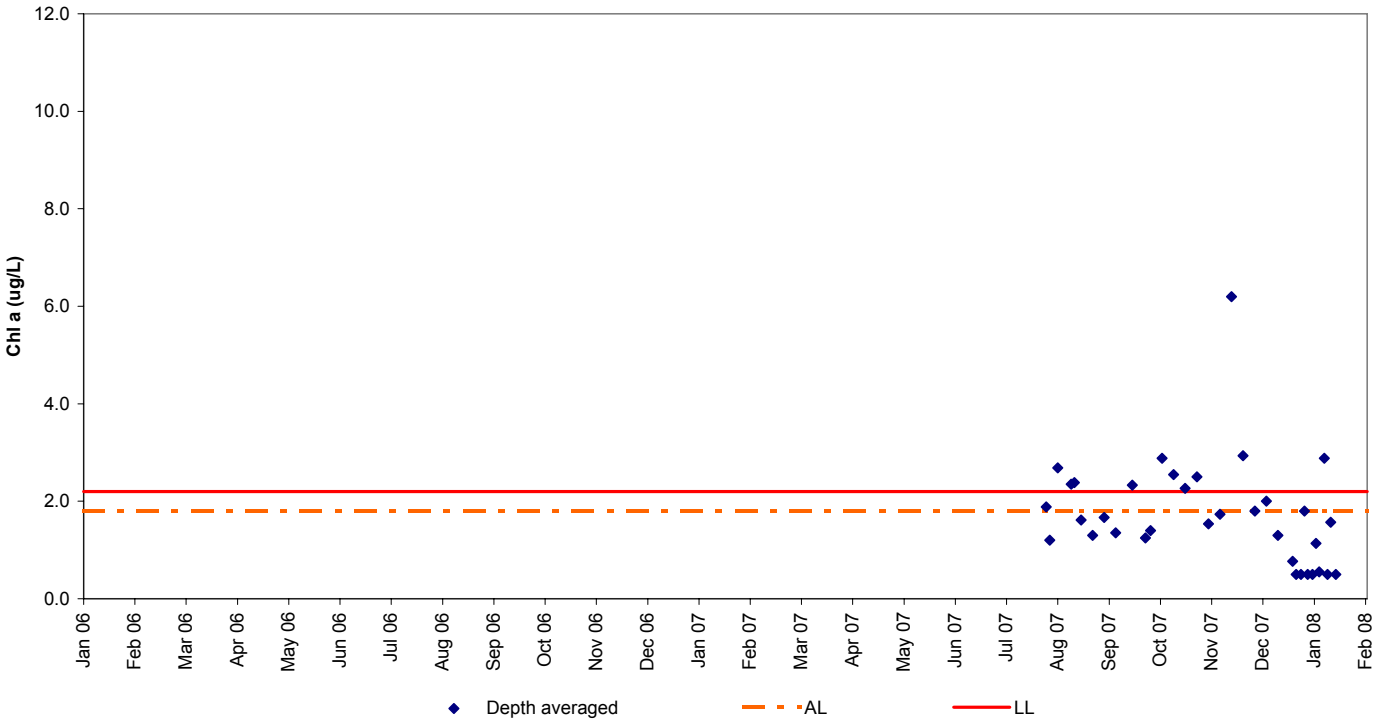
KS : Total Inorganic Nitrogen



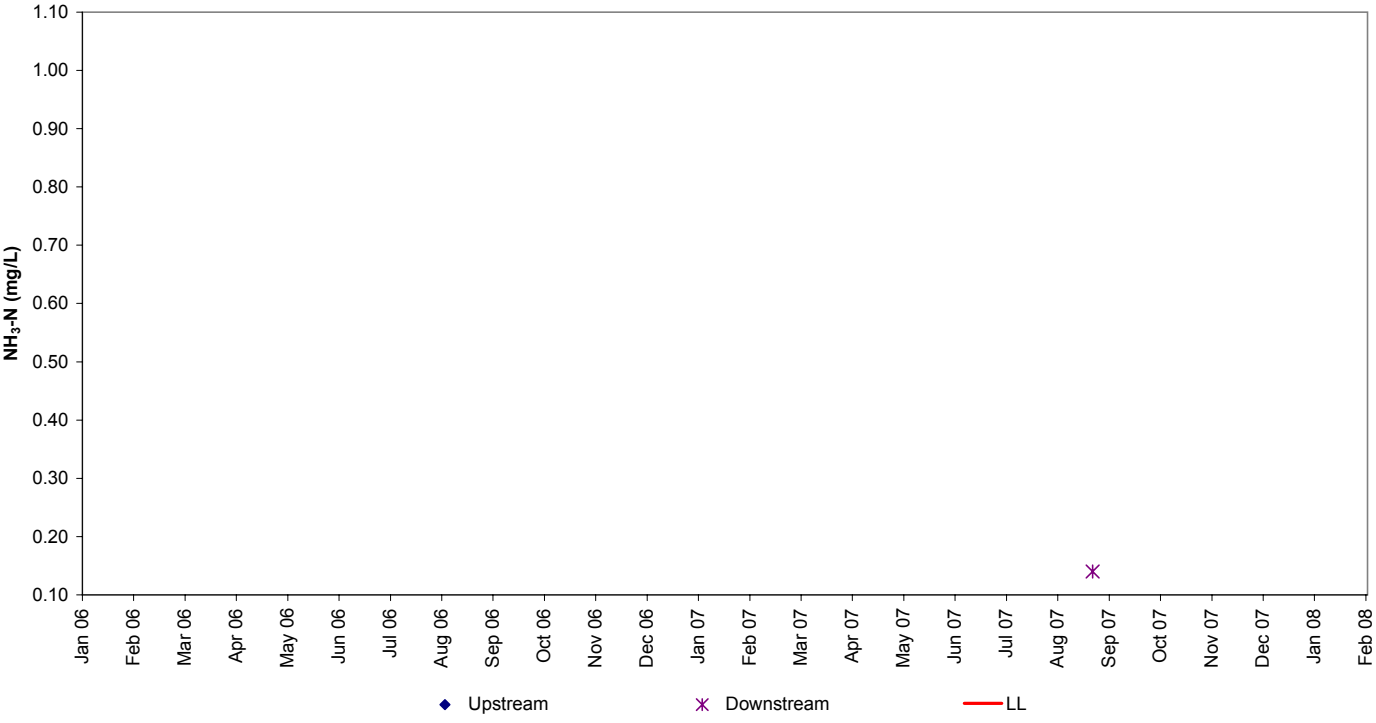
KS : Total Phosphorus



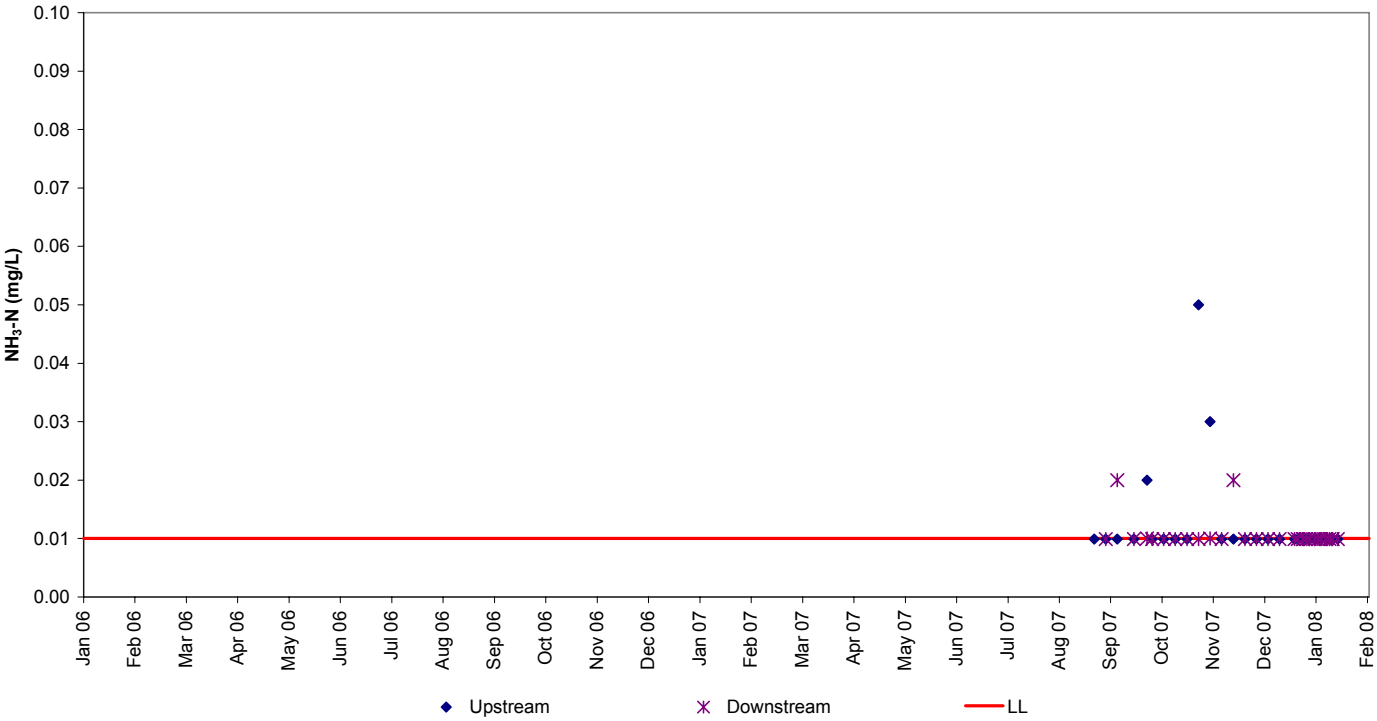
KS : Chlorophyll a



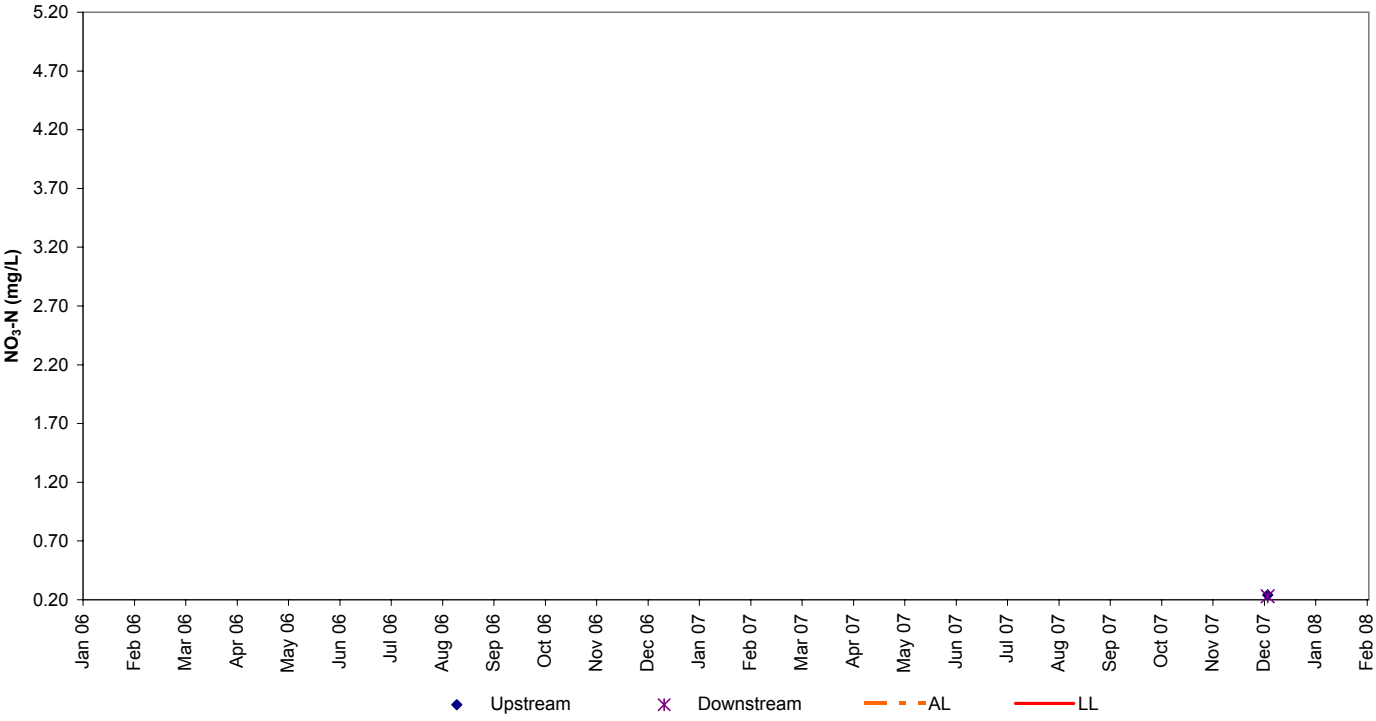
F_A : Ammonia Nitrogen (Large in Scale)



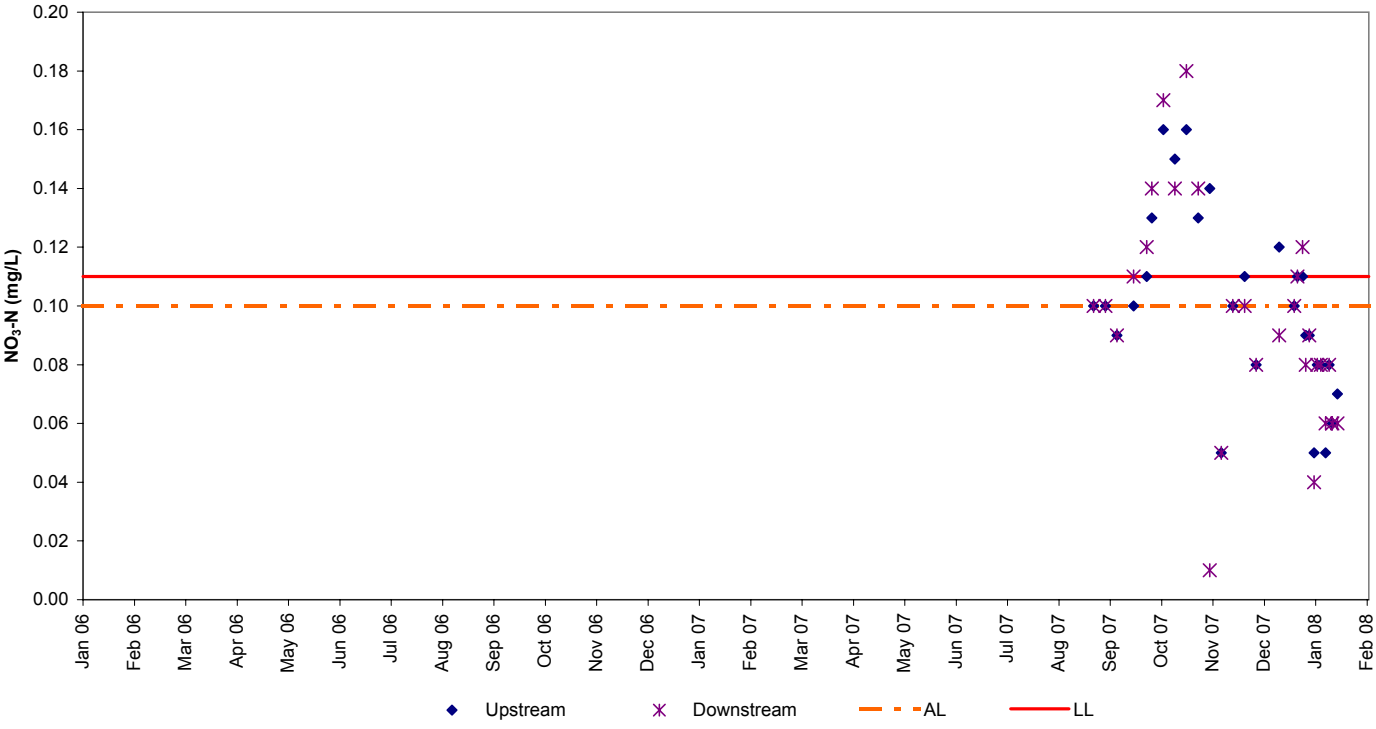
F_A : Ammonia Nitrogen (Normal in Scale)



F_A : Nitrate Nitrogen (Large in Scale)

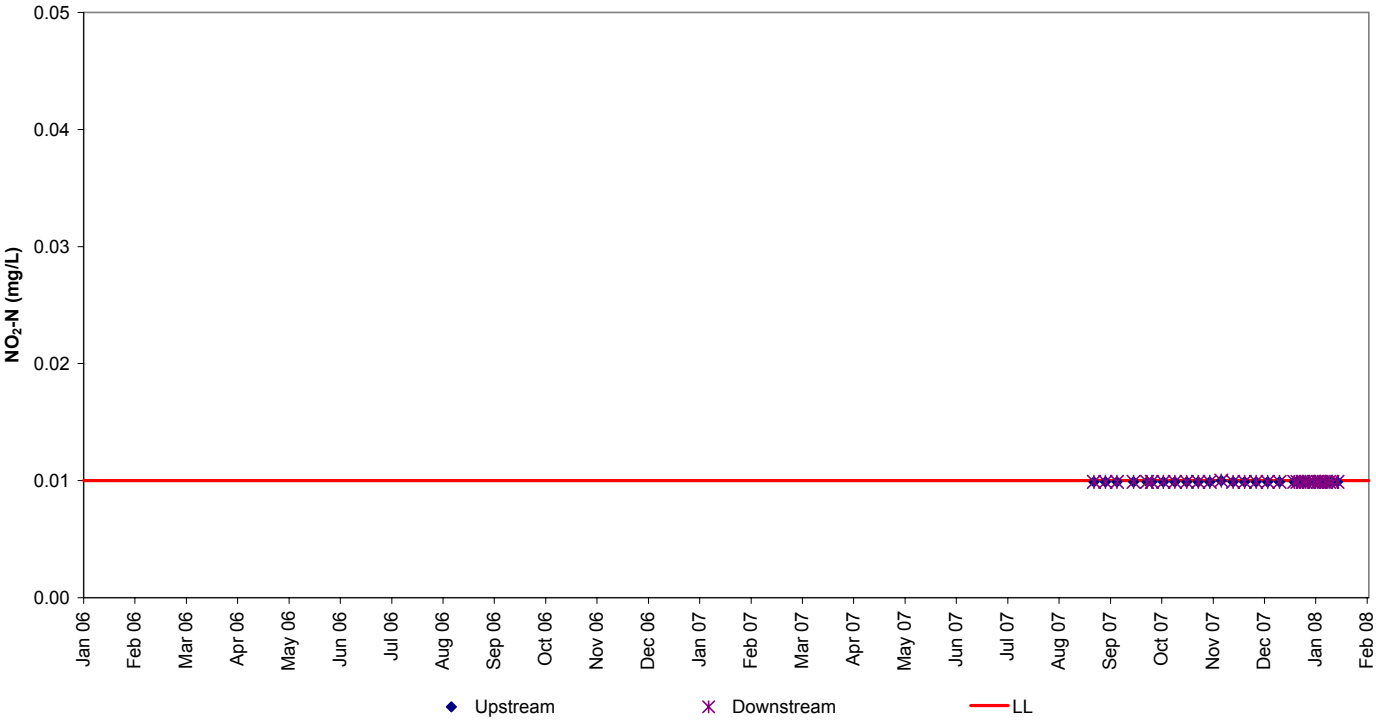


F_A : Nitrate Nitrogen (Normal in Scale)

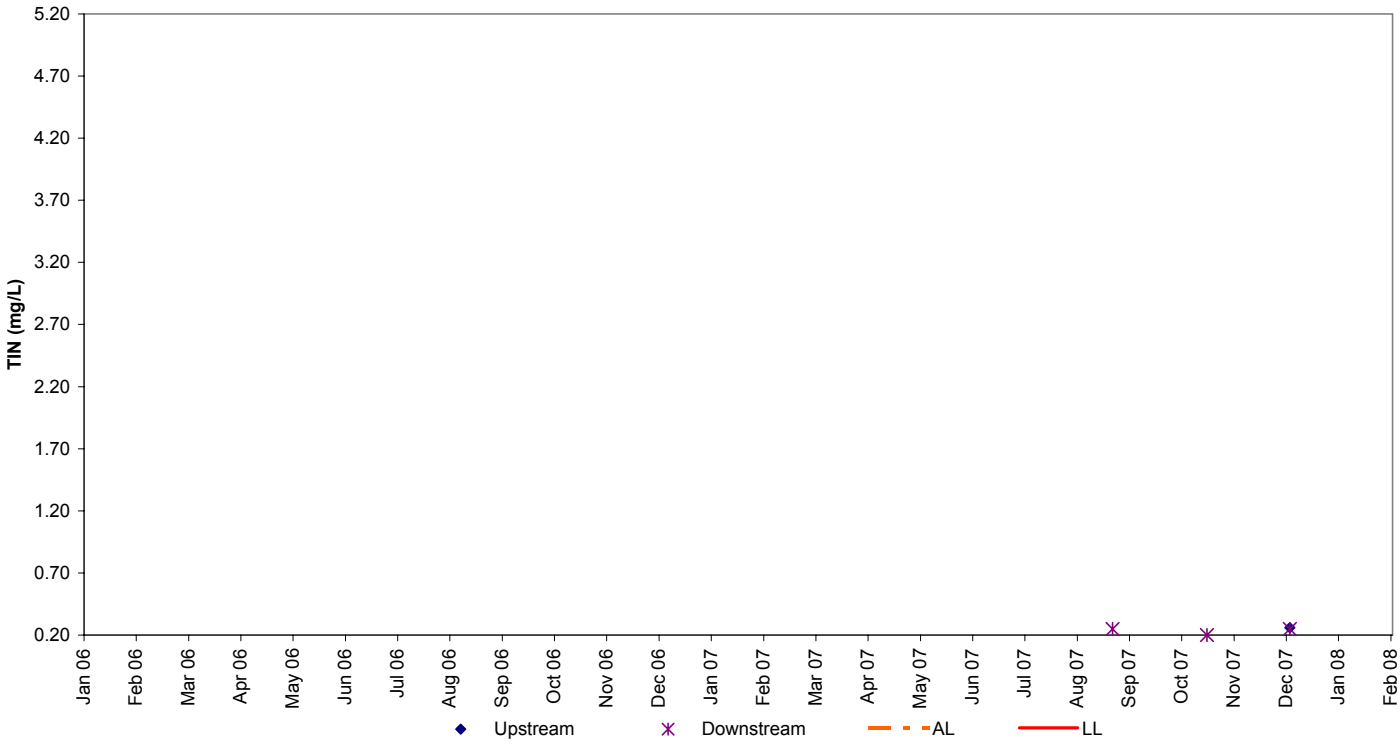


F_A : Nitrite Nitrogen (Large in Scale)

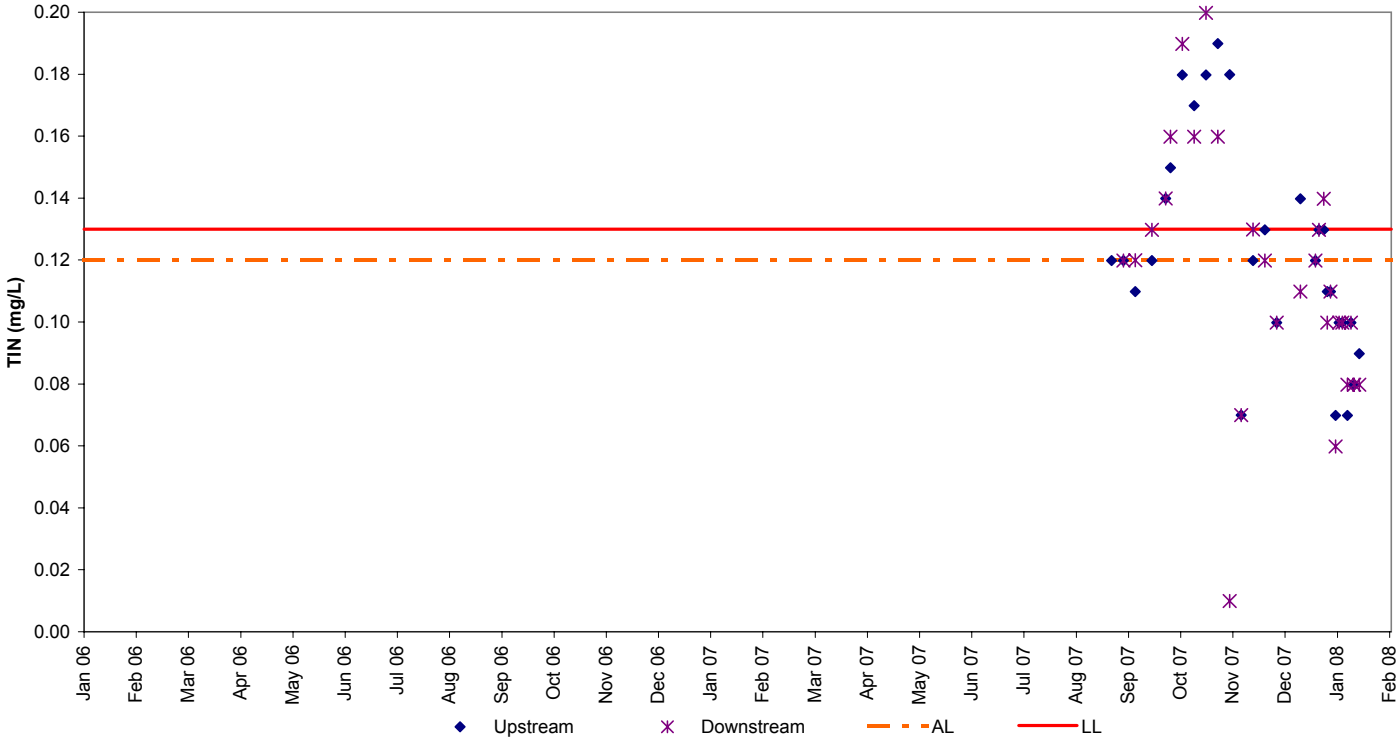
F_A : Nitrite Nitrogen (Normal in Scale)

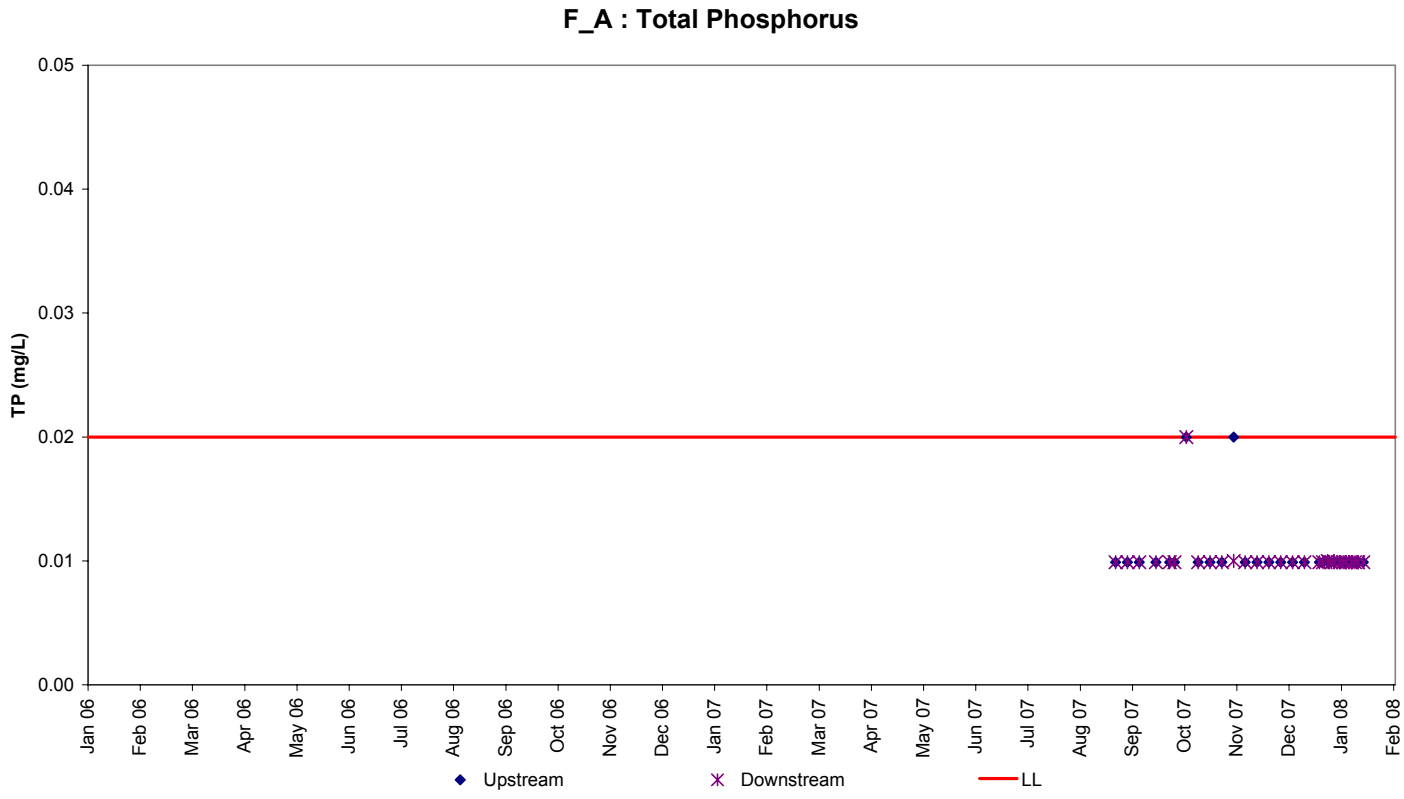


F_A : Total Inorganic Nitrogen (Large in Scale)



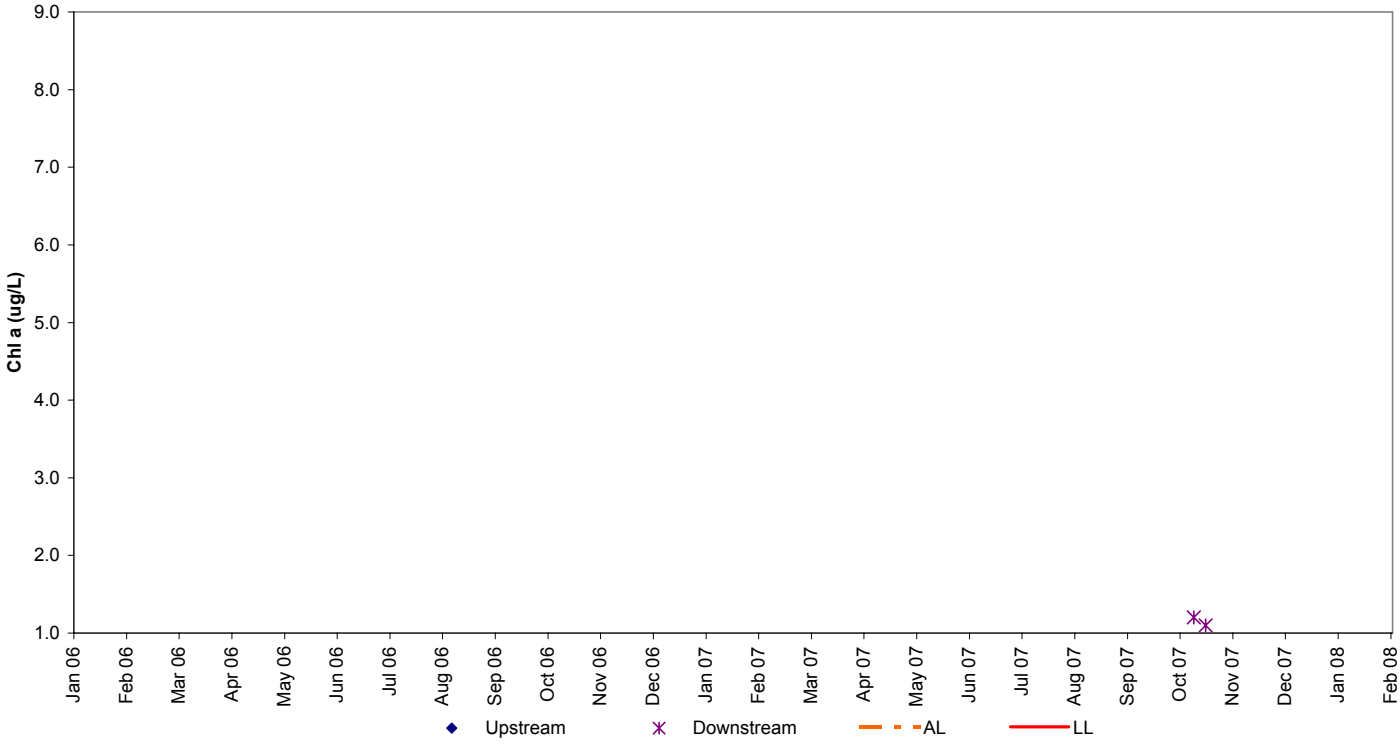
F_A : Total Inorganic Nitrogen (Normal in Scale)



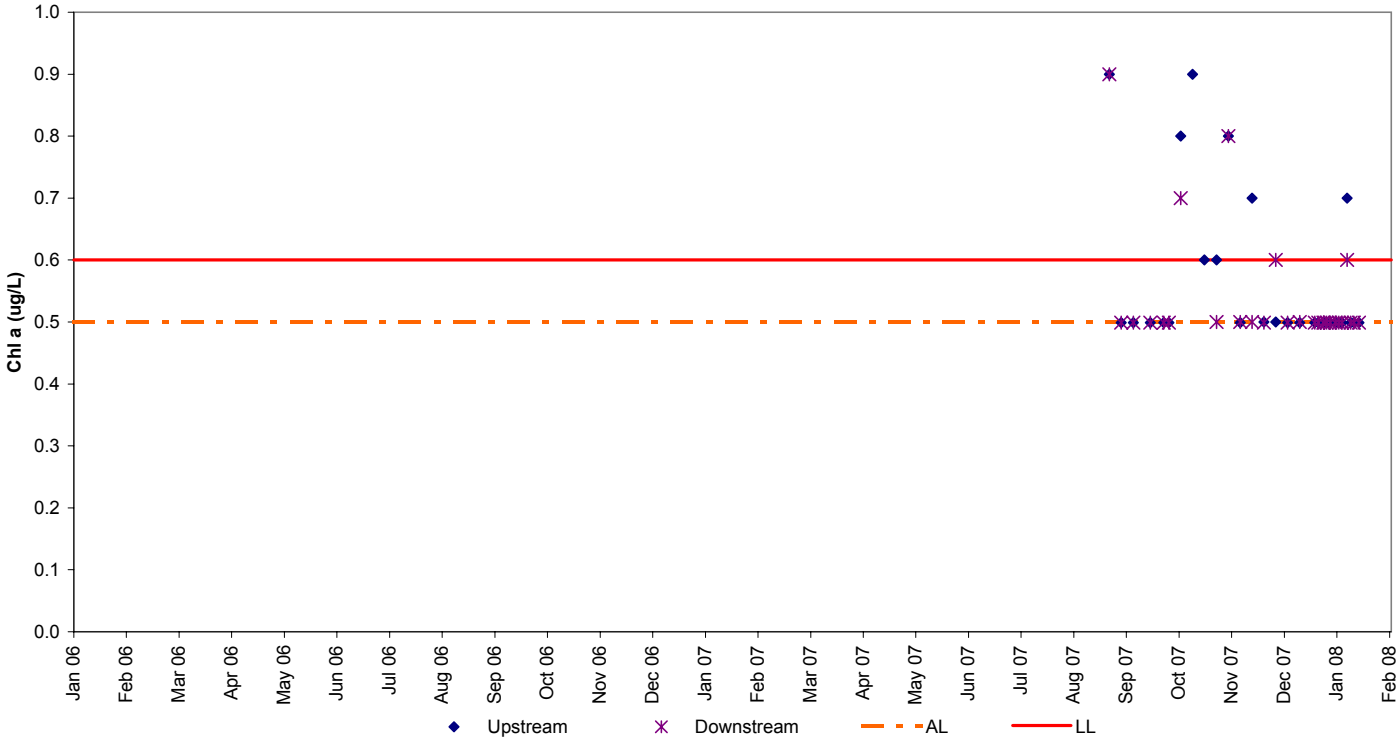


Blank - Not used

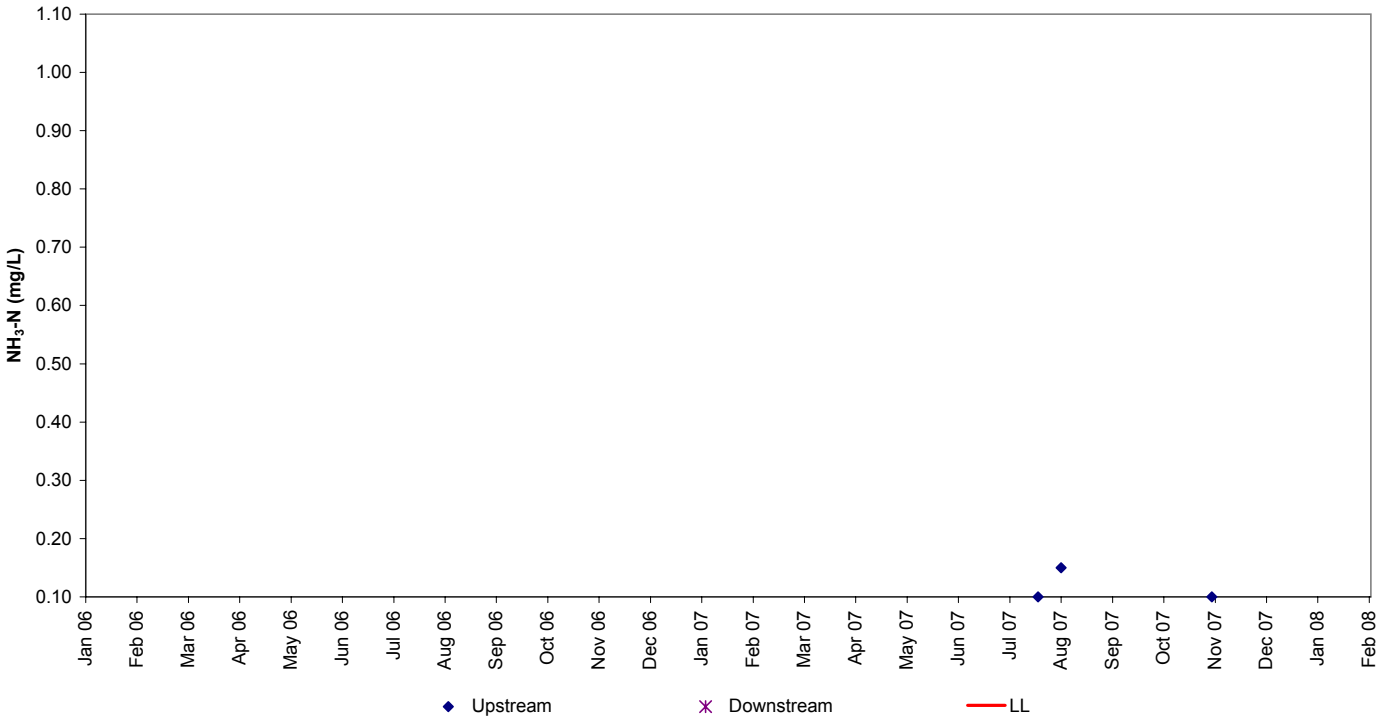
F_A : Chlorophyll a (Large in Scale)



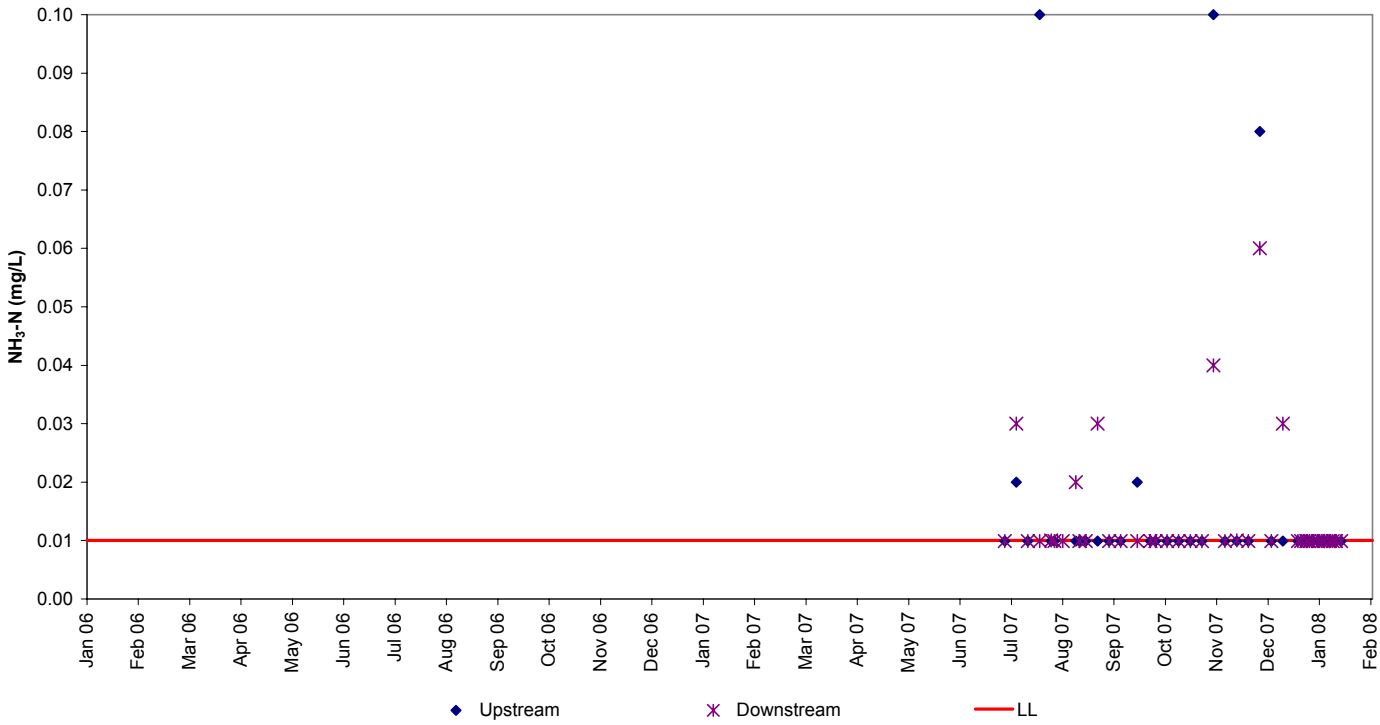
F_A : Chlorophyll a (Normal in Scale)



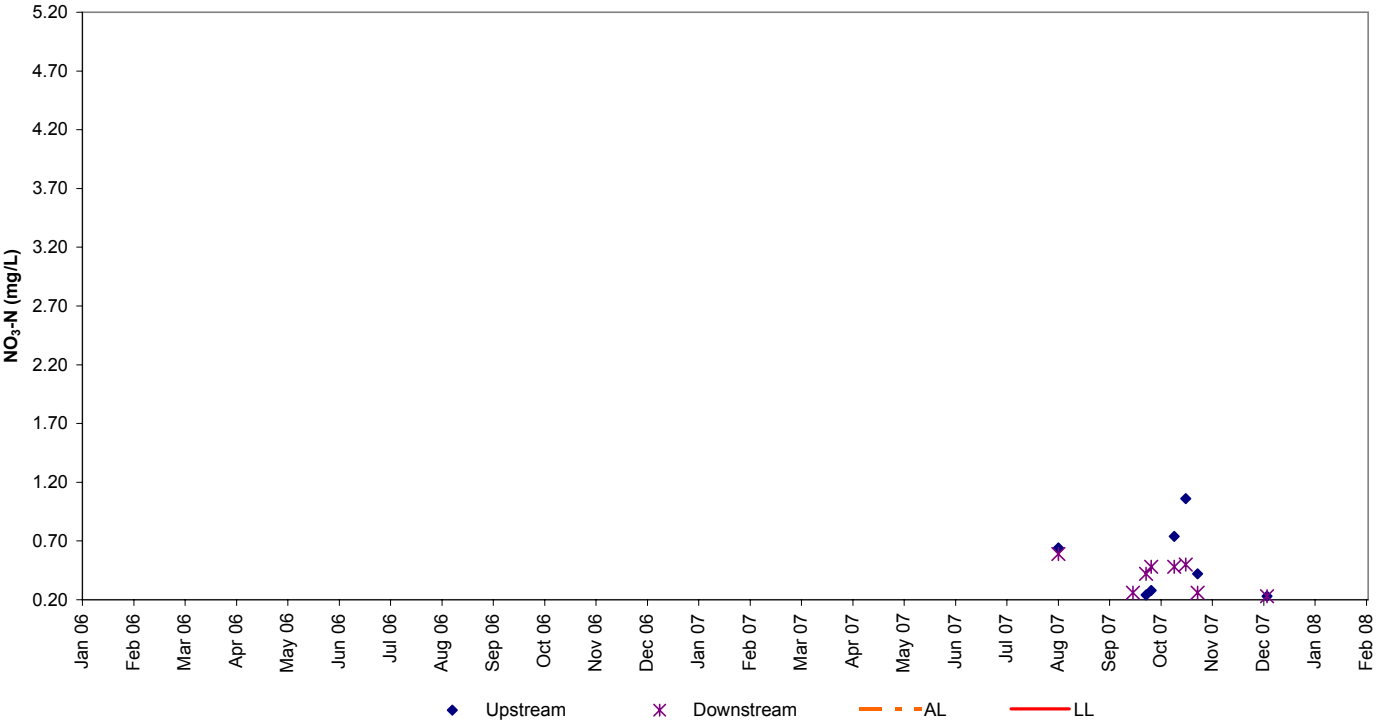
F_B : Ammonia Nitrogen (Large in Scale)



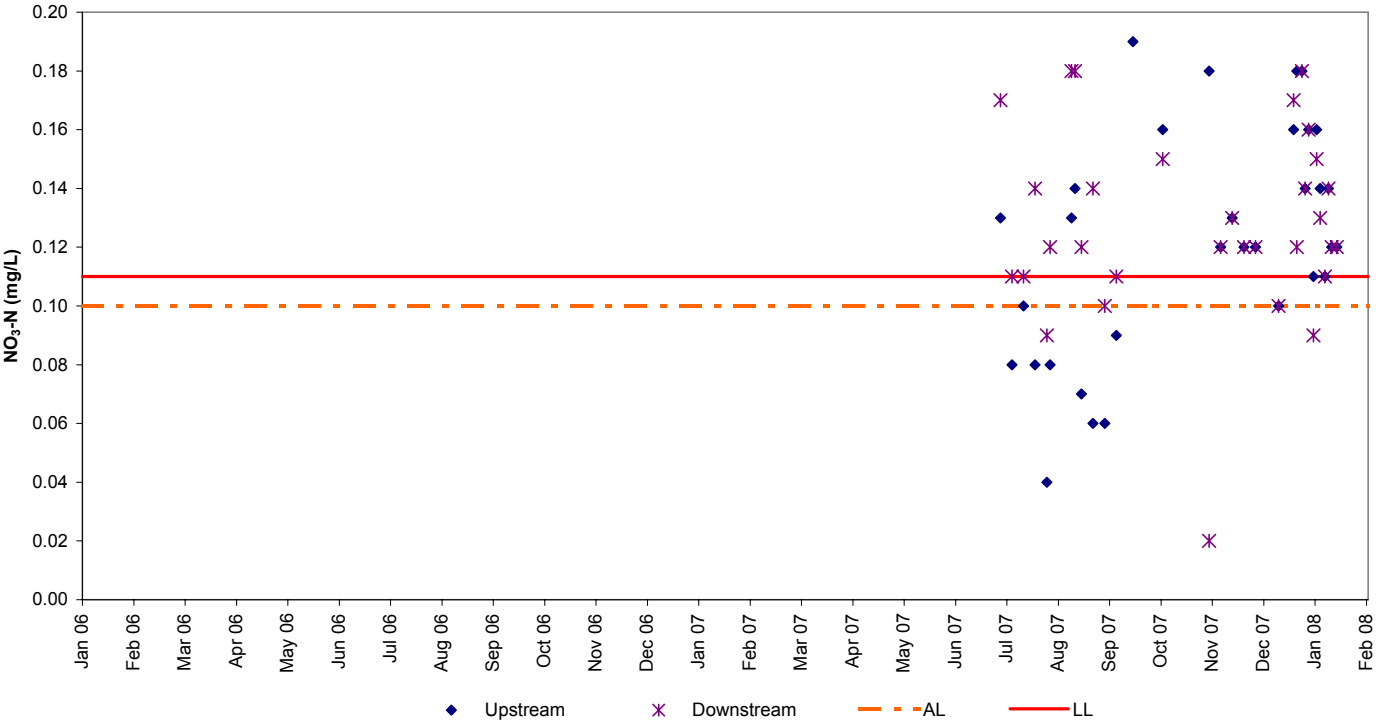
F_B : Ammonia Nitrogen (Normal in Scale)



F_B : Nitrate Nitrogen (Large in Scale)

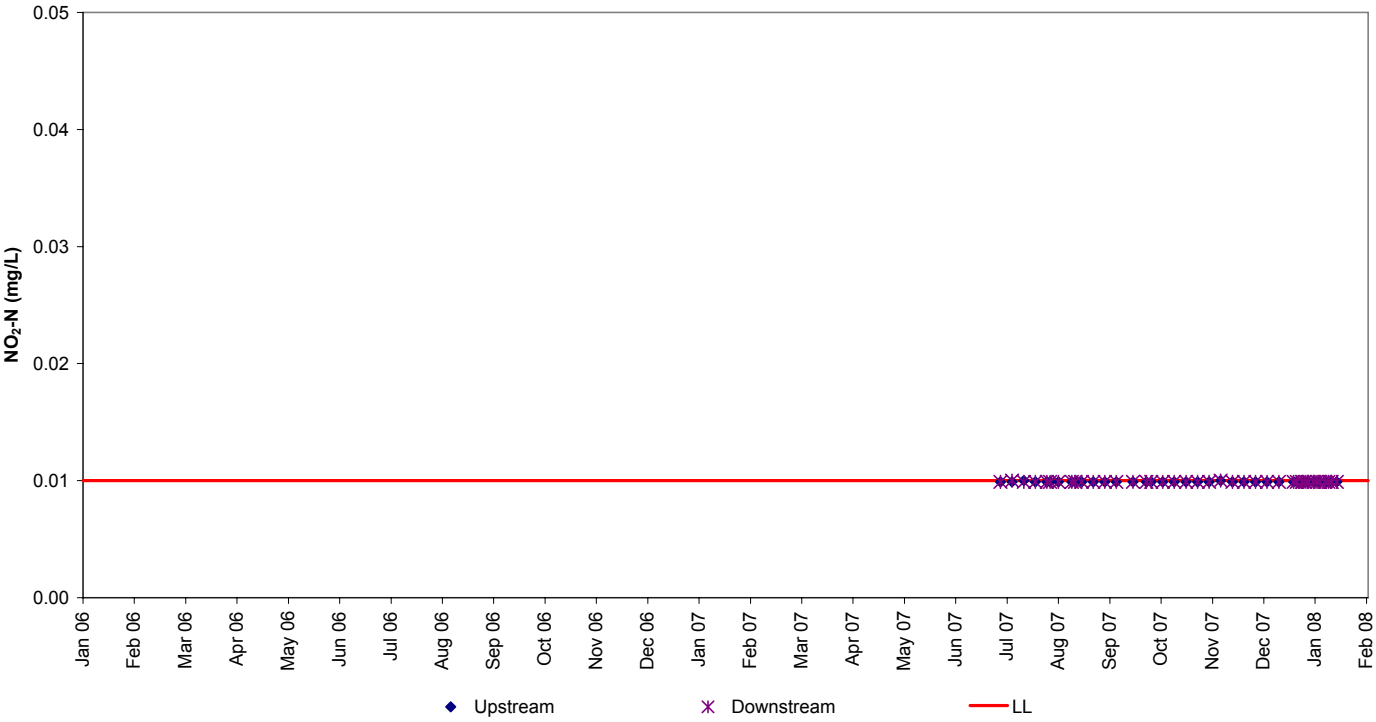


F_B : Nitrate Nitrogen (Normal in Scale)

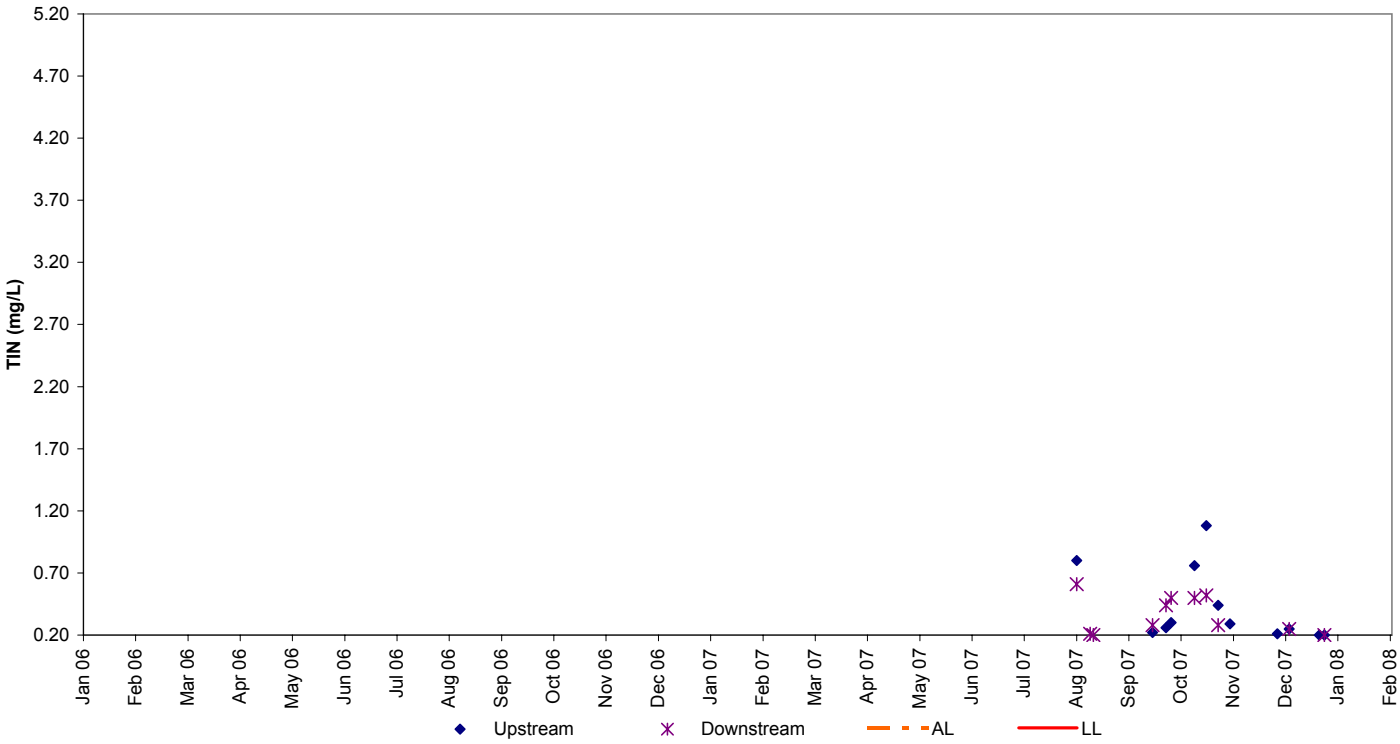


F_B : Nitrite Nitrogen (Large in Scale)

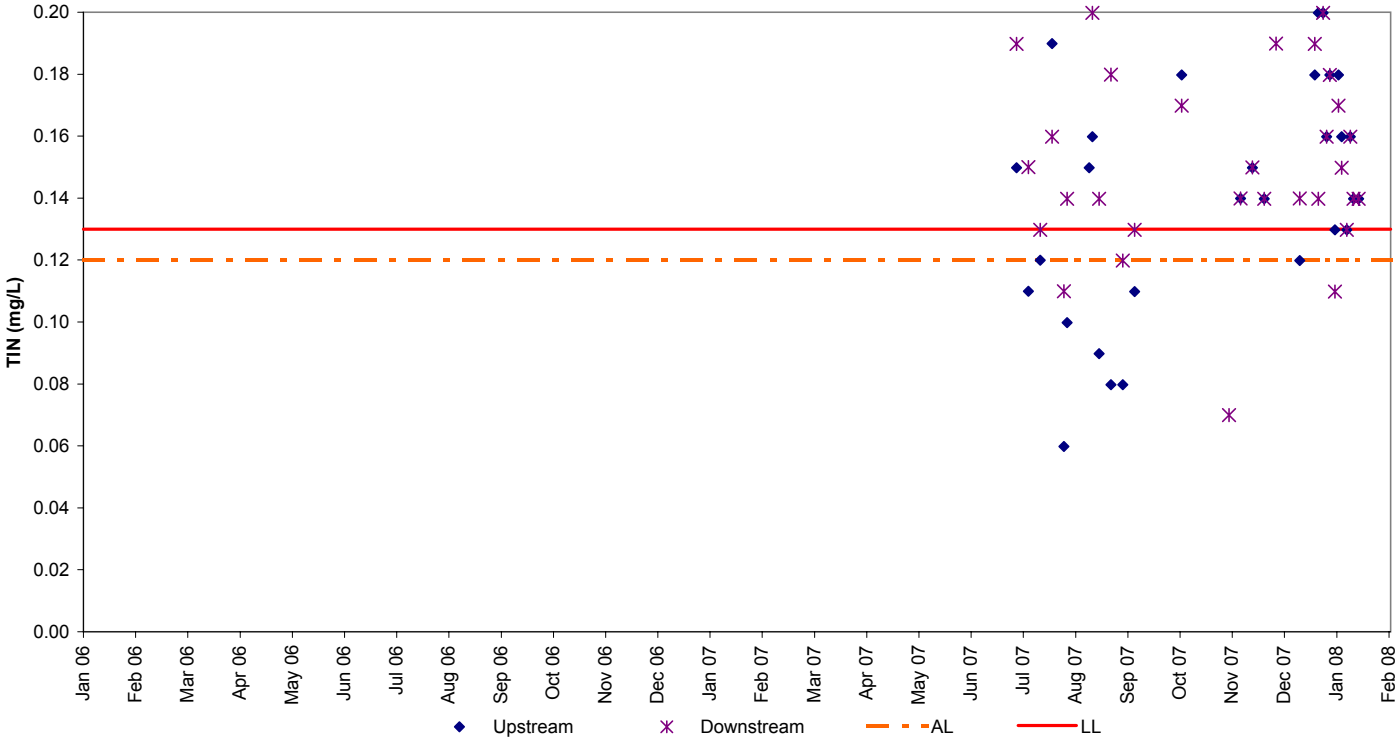
F_B : Nitrite Nitrogen (Normal in Scale)

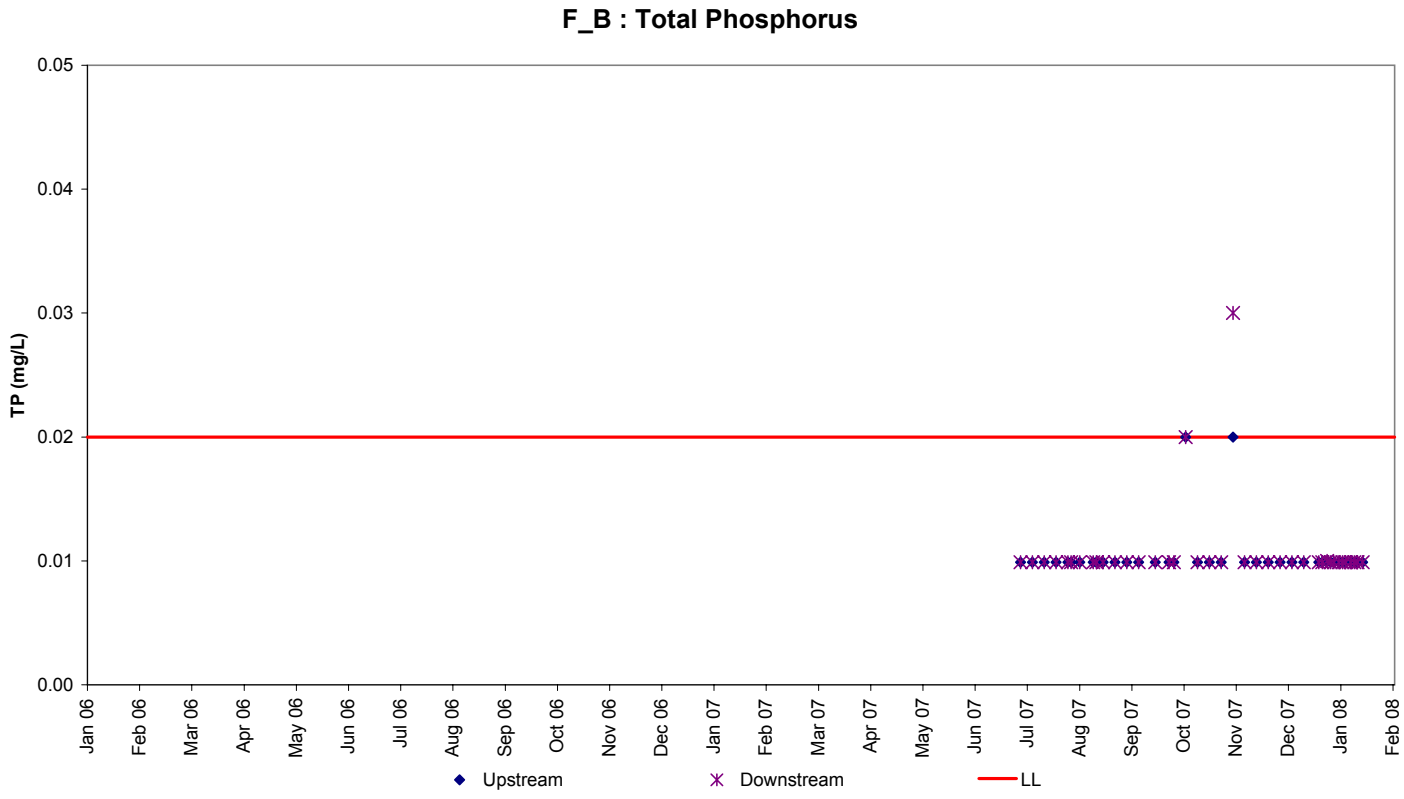


F_B : Total Inorganic Nitrogen (Large in Scale)



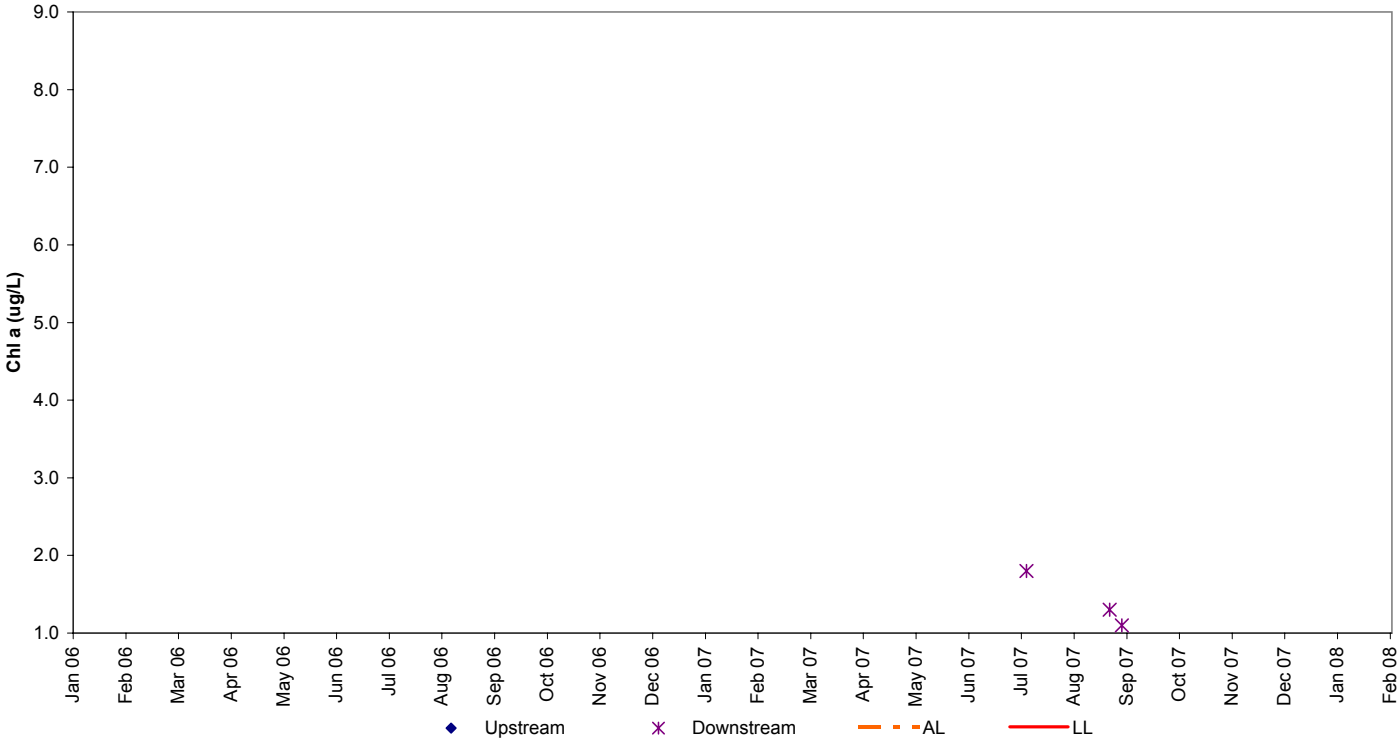
F_B : Total Inorganic Nitrogen (Normal in Scale)



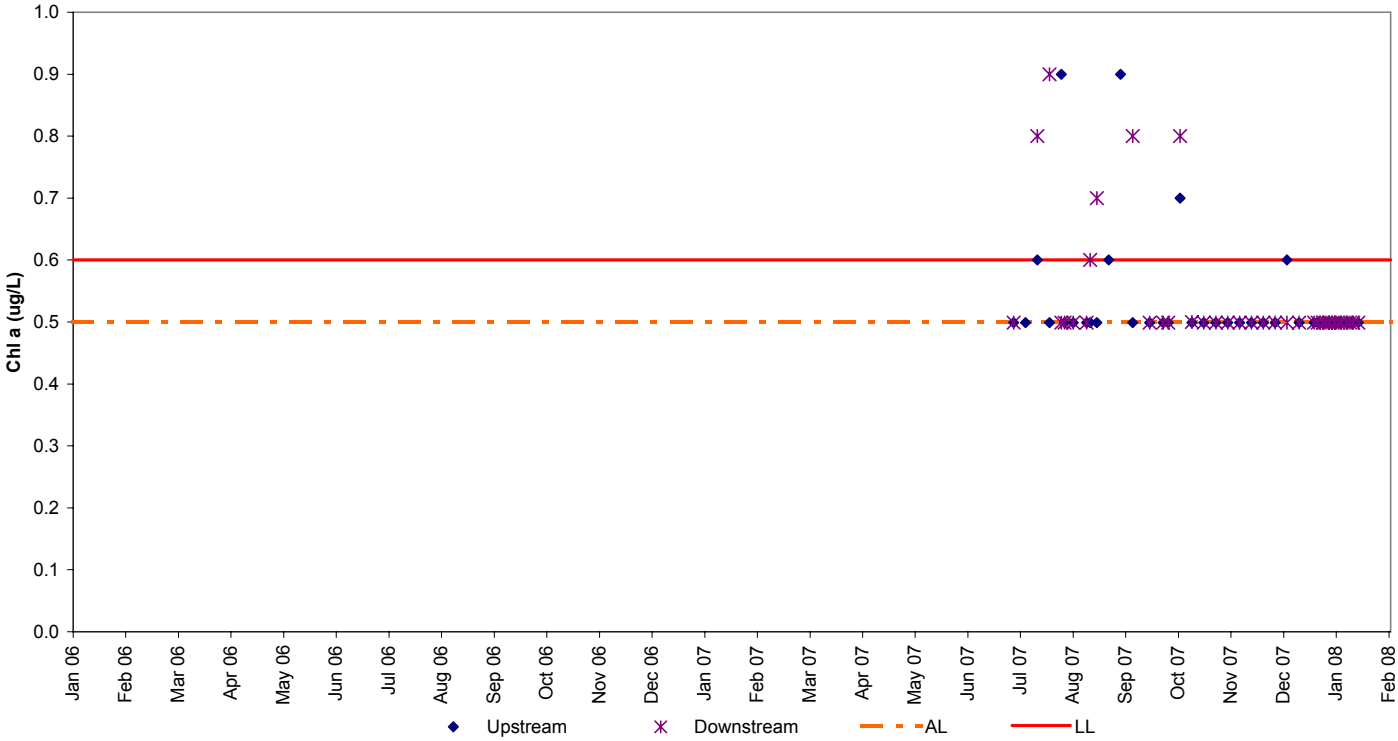


Blank - Not used

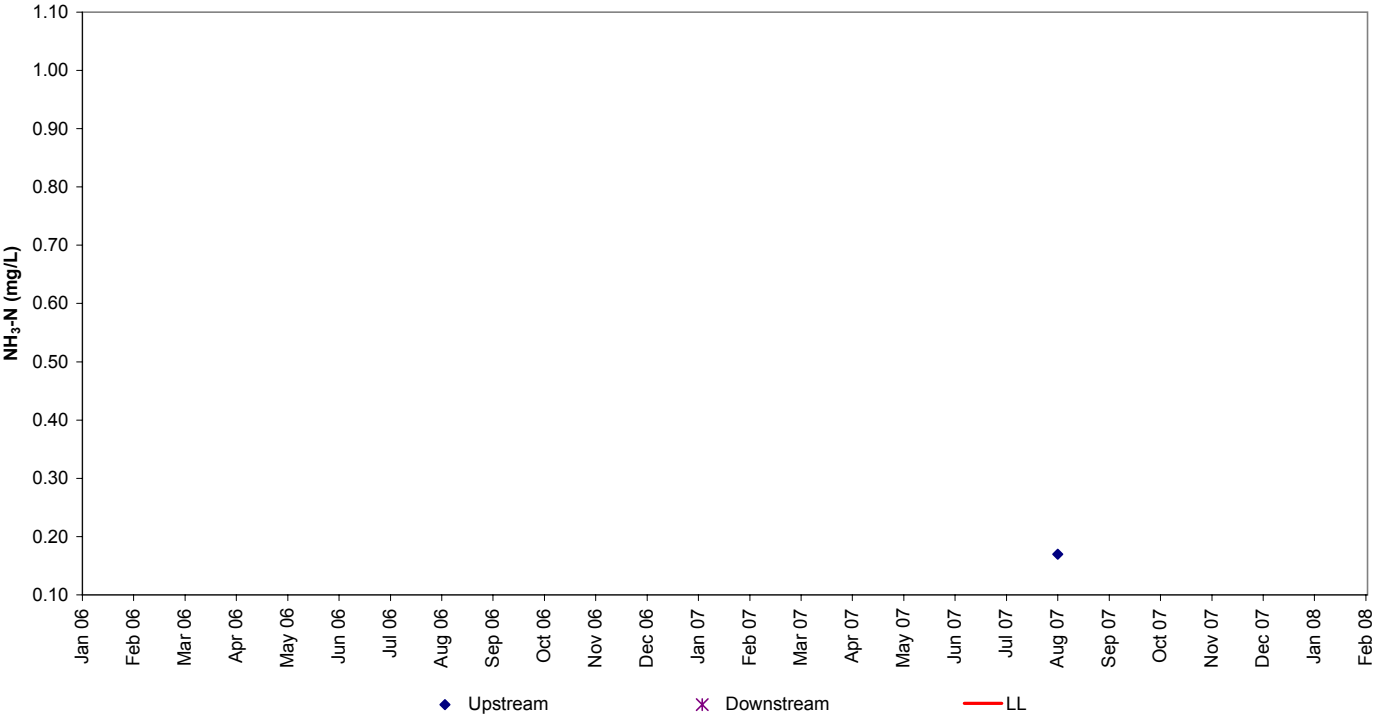
F_B : Chlorophyll a (Large in Scale)



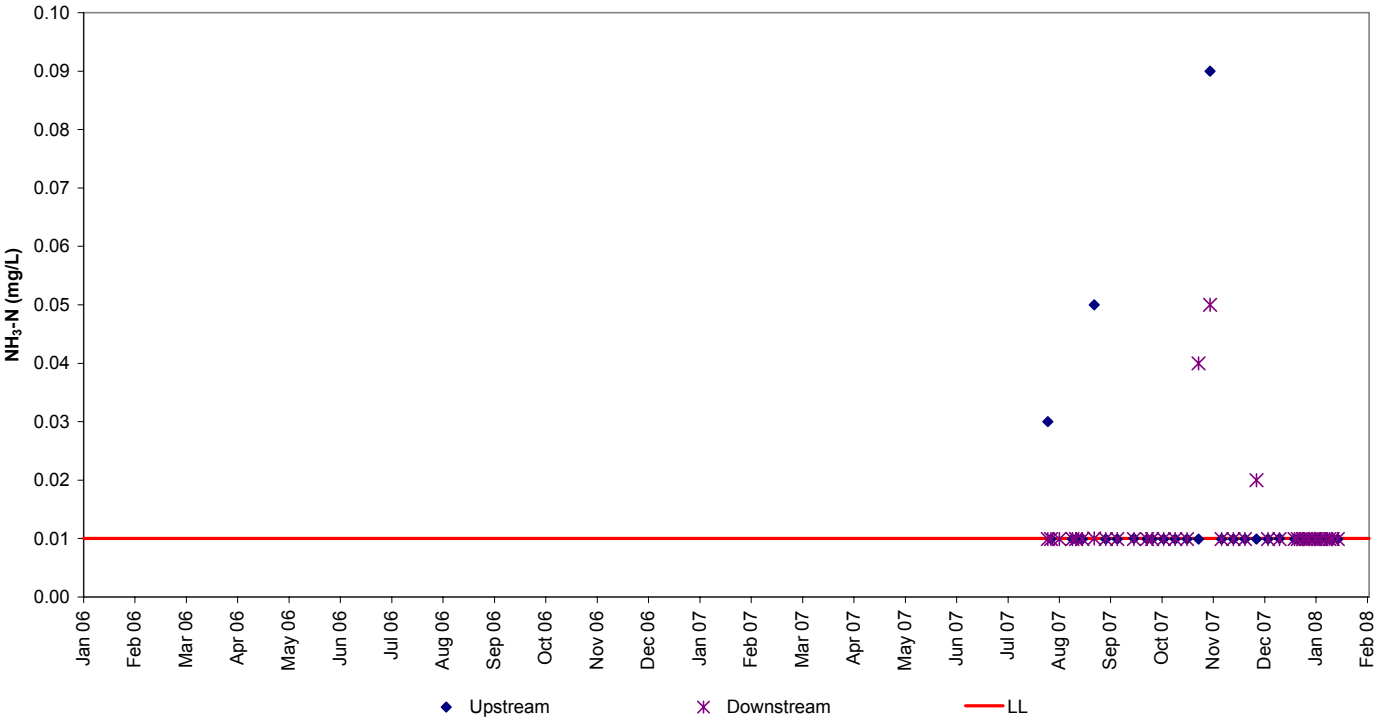
F_B : Chlorophyll a (Normal in Scale)



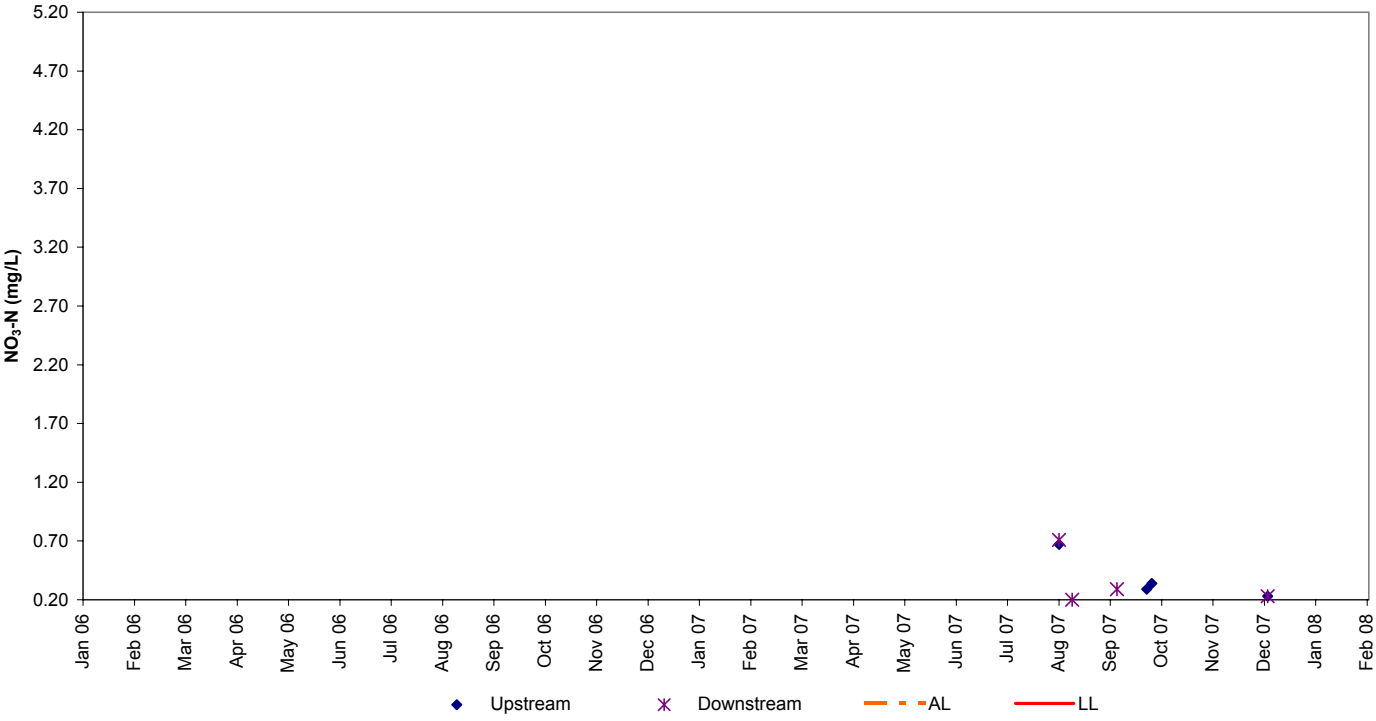
F_C : Ammonia Nitrogen (Large in Scale)



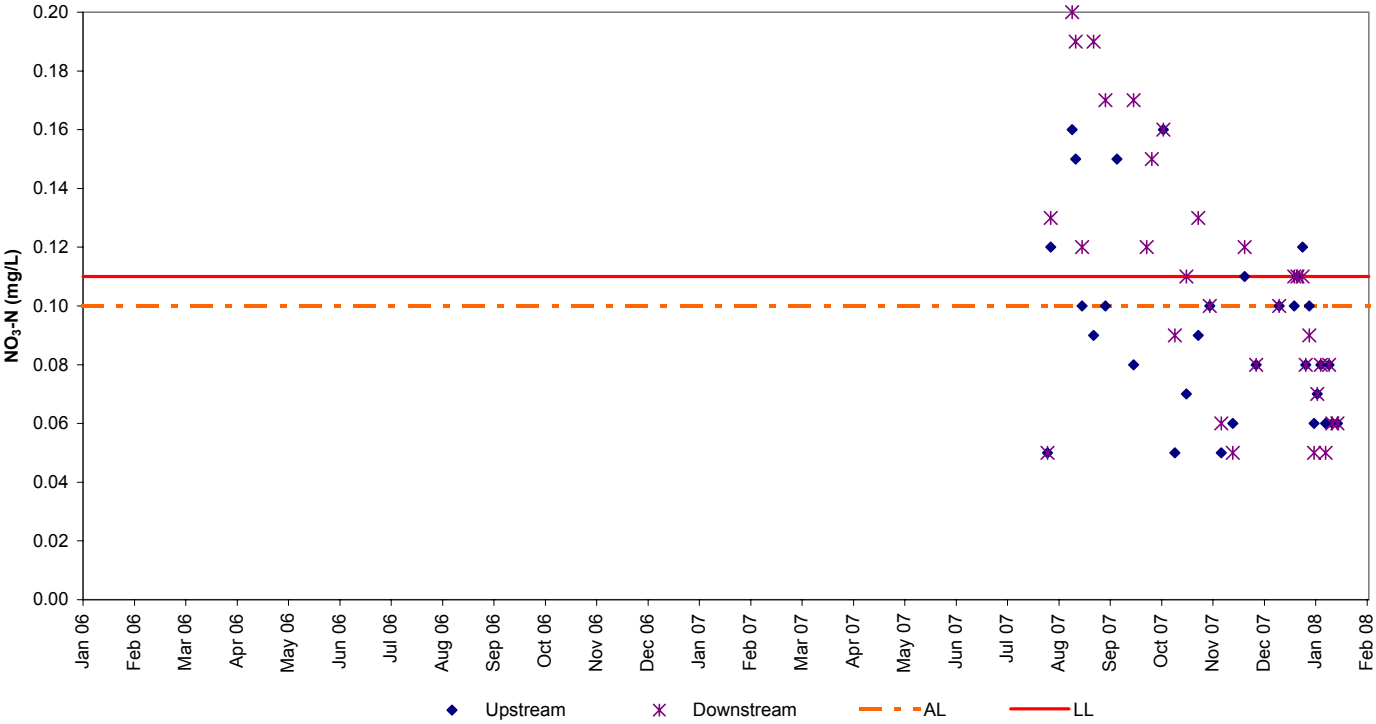
F_C : Ammonia Nitrogen (Normal in Scale)



F_C : Nitrate Nitrogen (Large in Scale)

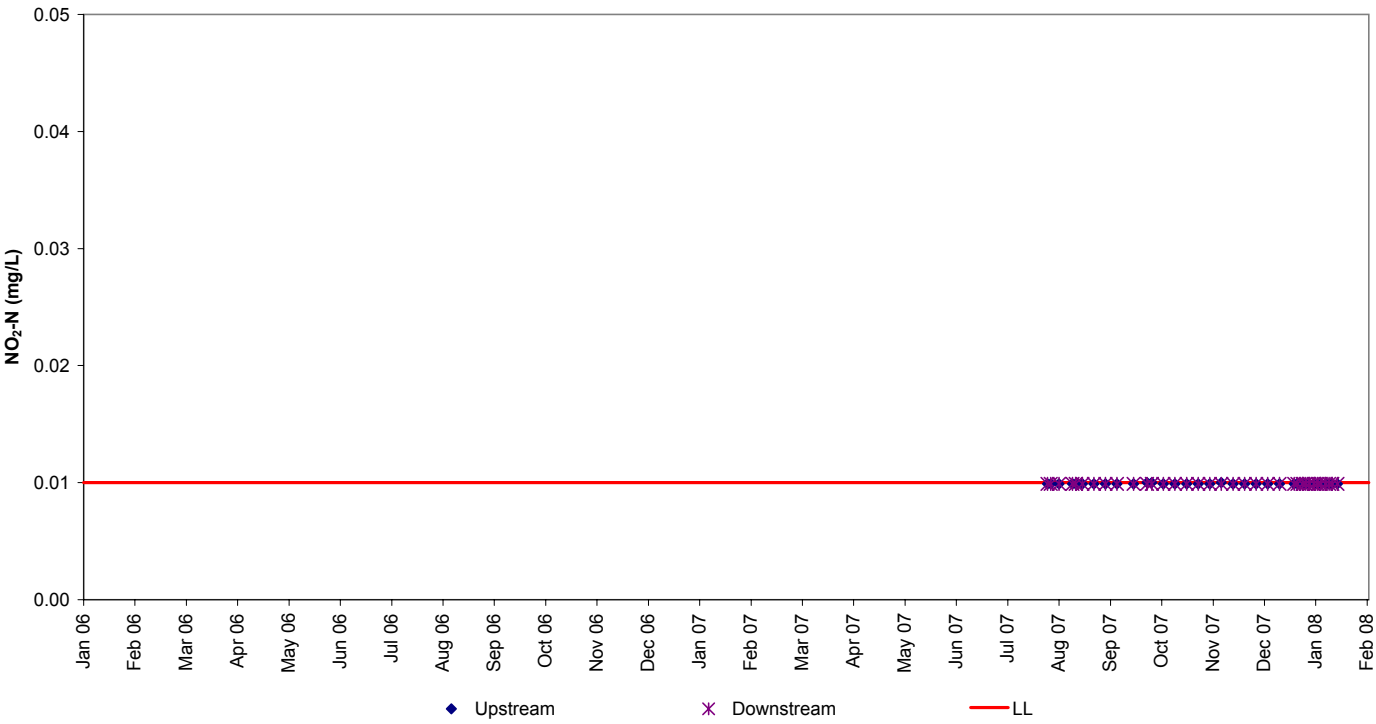


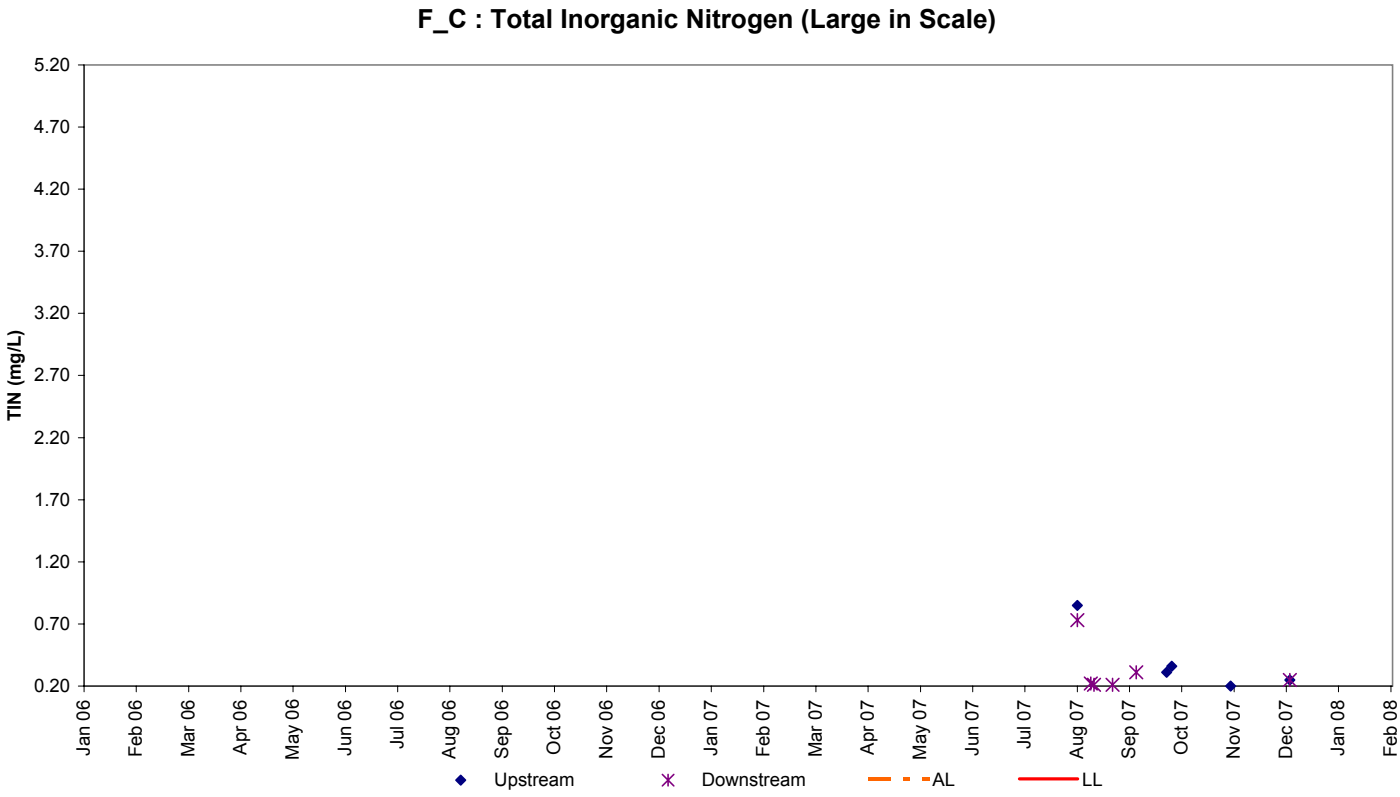
F_C : Nitrate Nitrogen (Normal in Scale)

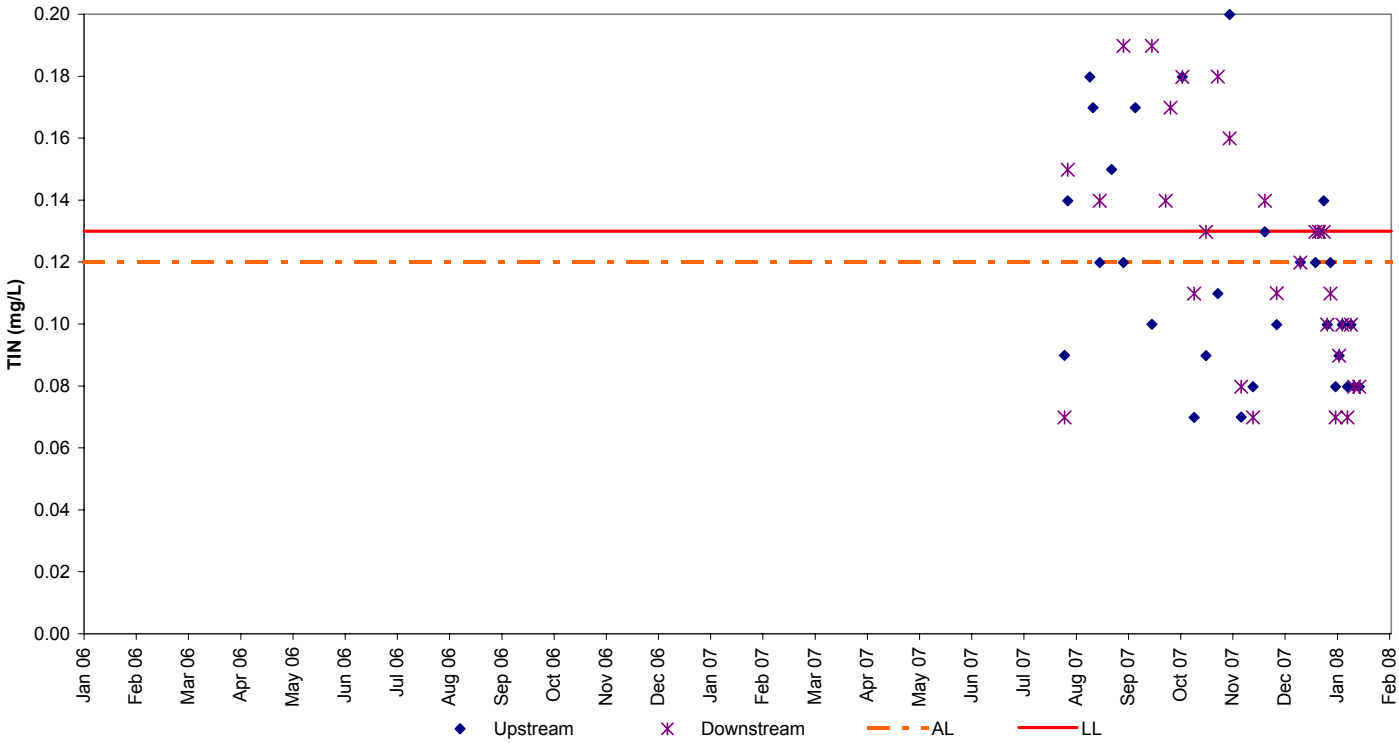


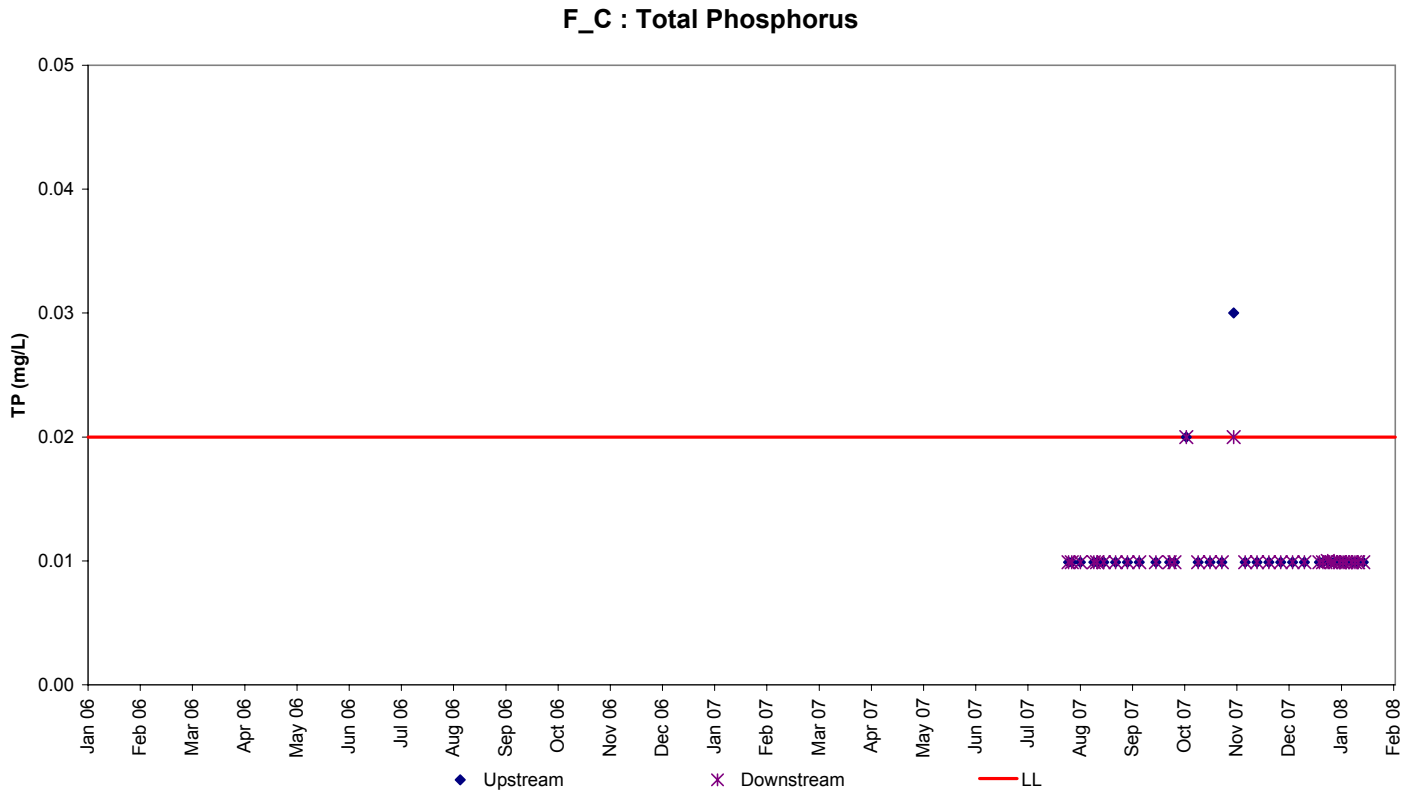
F_C : Nitrite Nitrogen (Large in Scale)

F_C : Nitrite Nitrogen (Normal in Scale)

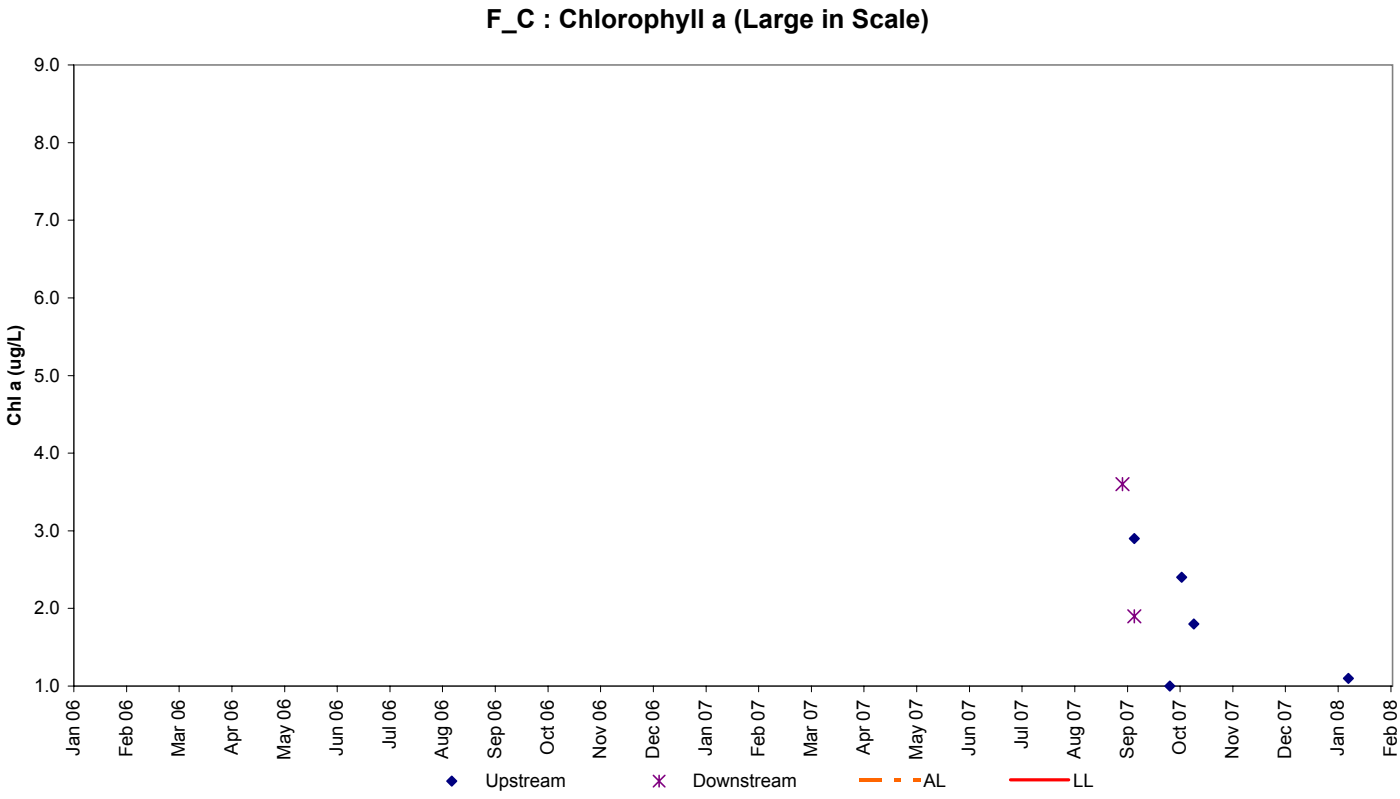


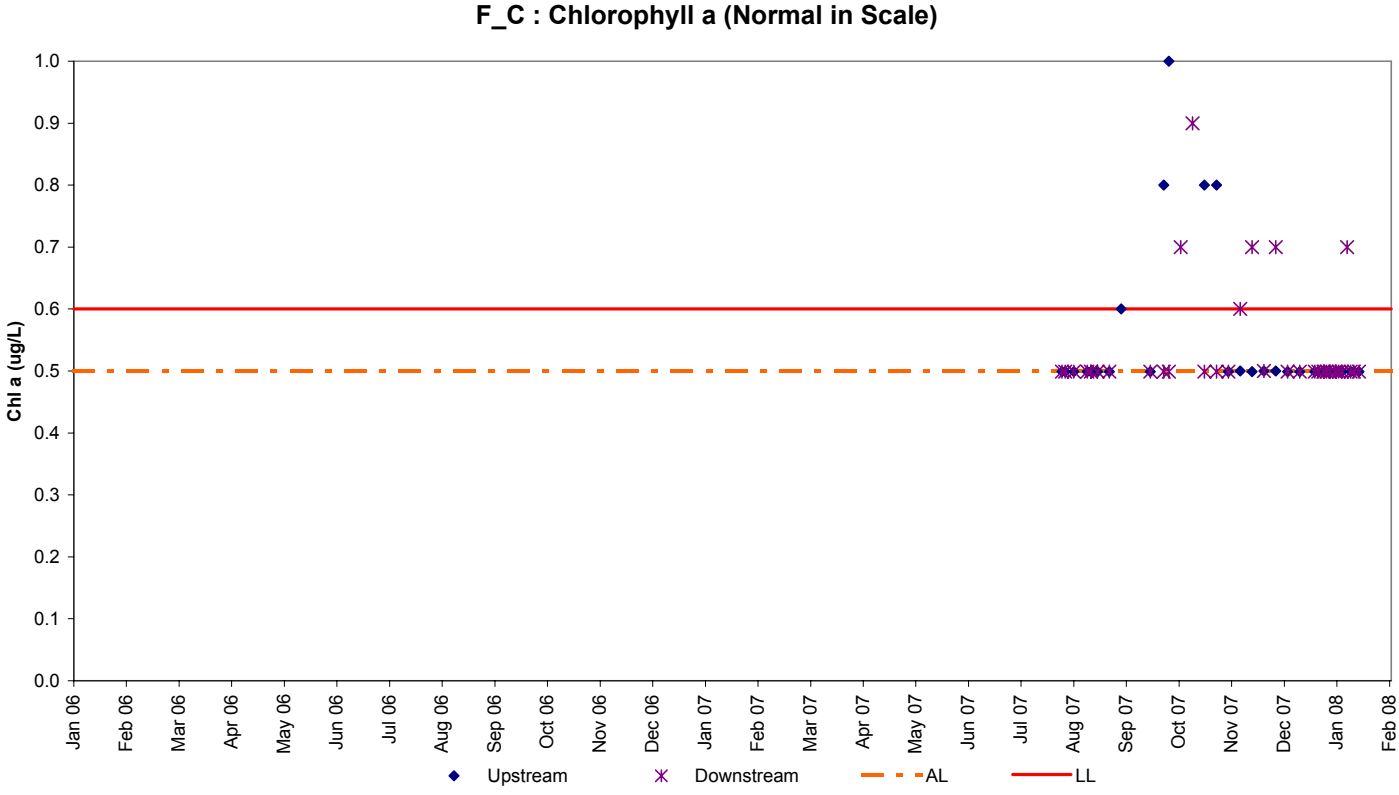

F_C : Total Inorganic Nitrogen (Large in Scale)
TIN (mg/L)
5.20
4.70
4.20
3.70
3.20
2.70
2.20
1.70
1.20
0.70
0.20
Jan 06
Feb 06
Mar 06
Apr 06
May 06
Jun 06
Jul 06
Aug 06
Sep 06
Oct 06
Nov 06
Dec 06
Jan 07
Feb 07
Mar 07
Apr 07
May 07
Jun 07
Jul 07
Aug 07
Sep 07
Oct 07
Nov 07
Dec 07
Jan 08
Feb 08
Upstream
Downstream
AL
LL


F_C : Total Inorganic Nitrogen (Normal in Scale)
TIN (mg/L)
0.20
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Jan 06
Feb 06
Mar 06
Apr 06
May 06
Jun 06
Jul 06
Aug 06
Sep 06
Oct 06
Nov 06
Dec 06
Jan 07
Feb 07
Mar 07
Apr 07
May 07
Jun 07
Jul 07
Aug 07
Sep 07
Oct 07
Nov 07
Dec 07
Jan 08
Feb 08
Upstream
Downstream
AL
LL

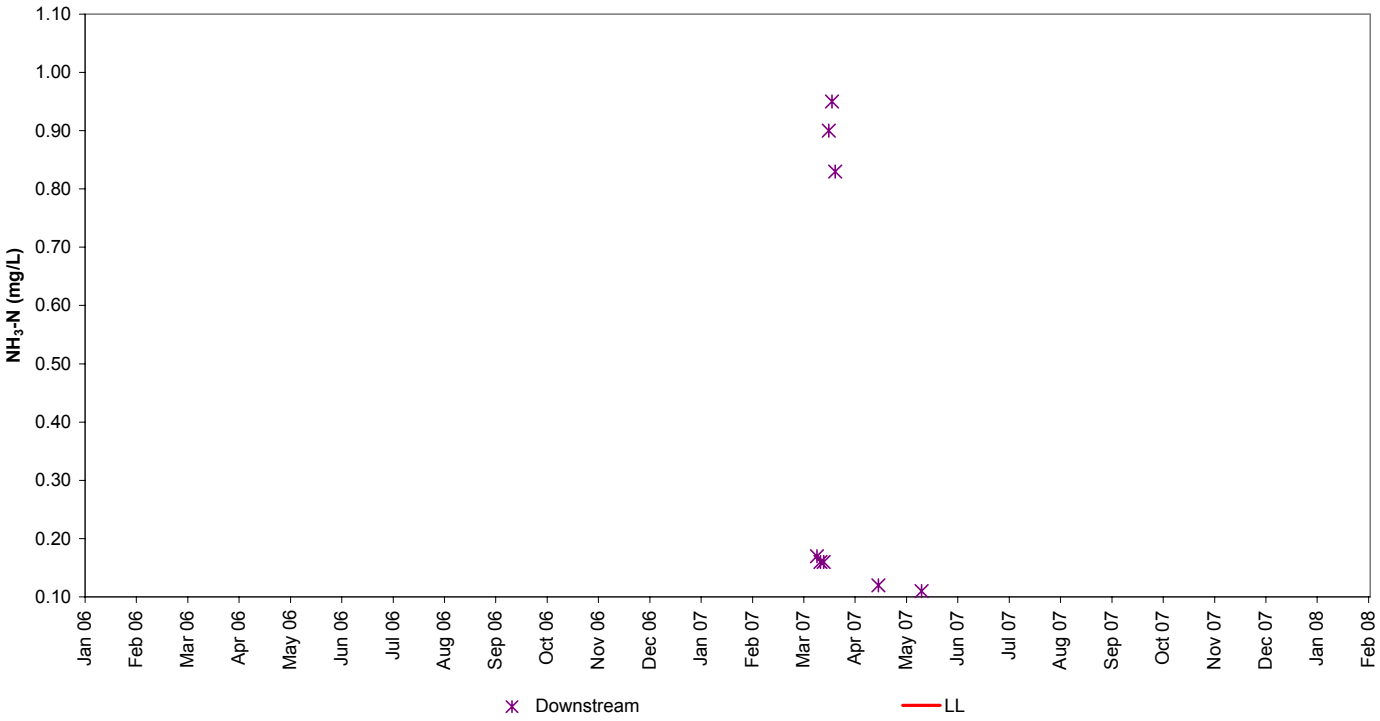


Blank - Not used

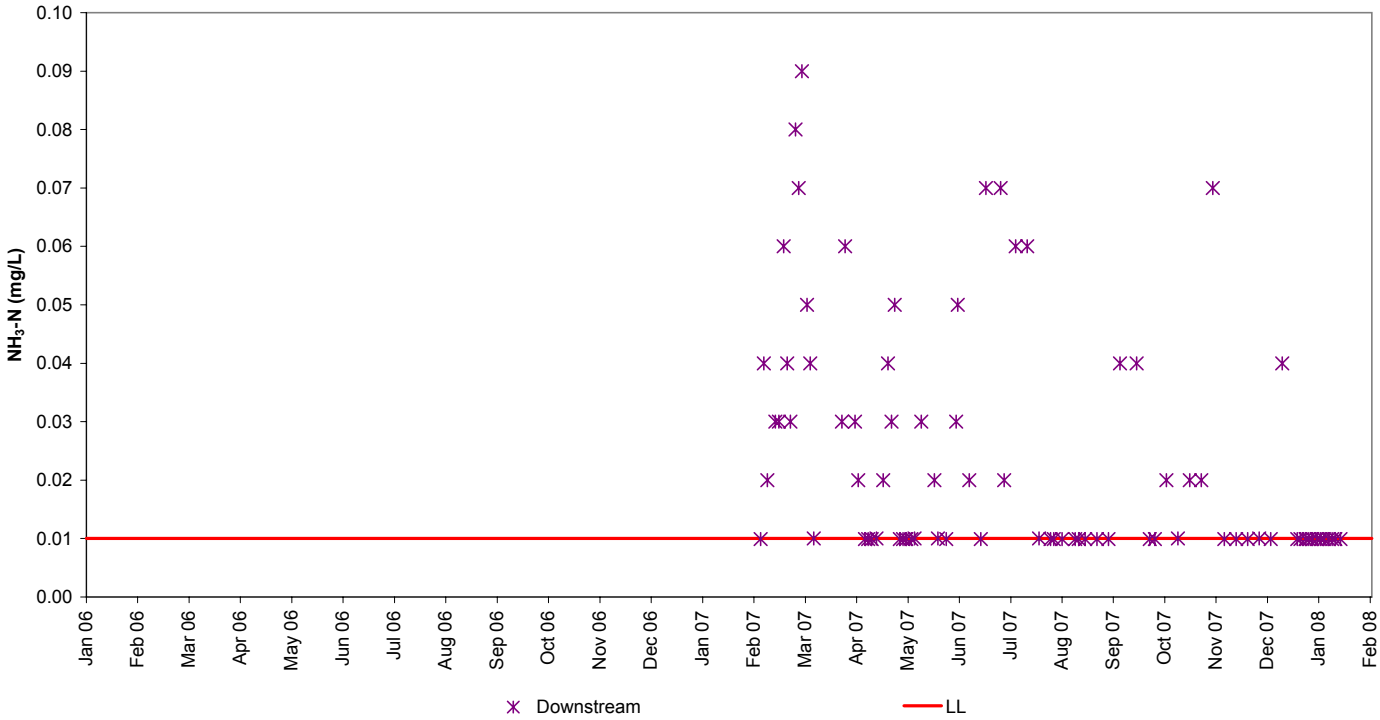

F_C : Chlorophyll a (Large in Scale)
Chl a (ug/L)
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
Jan 06
Feb 06
Mar 06
Apr 06
May 06
Jun 06
Jul 06
Aug 06
Sep 06
Oct 06
Nov 06
Dec 06
Jan 07
Feb 07
Mar 07
Apr 07
May 07
Jun 07
Jul 07
Aug 07
Sep 07
Oct 07
Nov 07
Dec 07
Jan 08
Feb 08
Upstream
Downstream
AL
LL


F_C : Chlorophyll a (Normal in Scale)
Chl a (ug/L)
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Jan 06
Feb 06
Mar 06
Apr 06
May 06
Jun 06
Jul 06
Aug 06
Sep 06
Oct 06
Nov 06
Dec 06
Jan 07
Feb 07
Mar 07
Apr 07
May 07
Jun 07
Jul 07
Aug 07
Sep 07
Oct 07
Nov 07
Dec 07
Jan 08
Feb 08
Upstream
Downstream
AL
LL

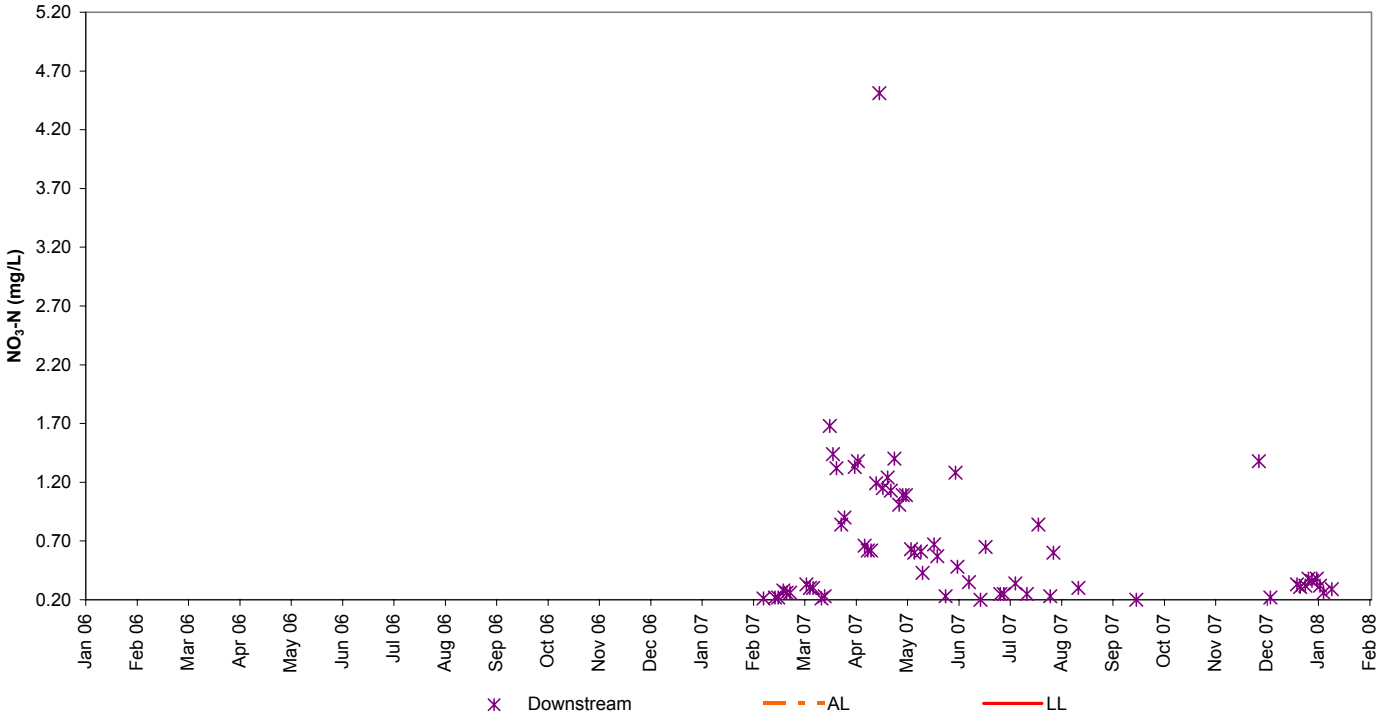
F_Inland M : Ammonia Nitrogen (Large in Scale)



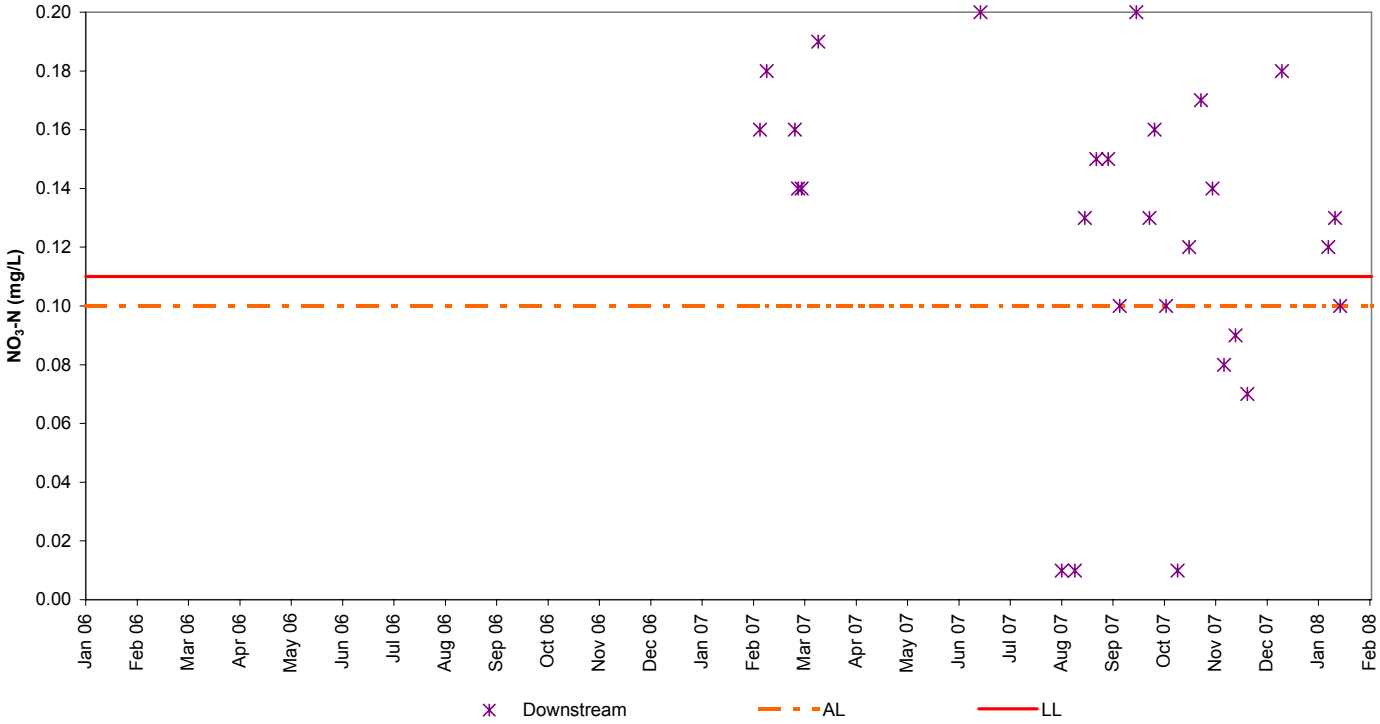
F_Inland M : Ammonia Nitrogen (Normal in Scale)



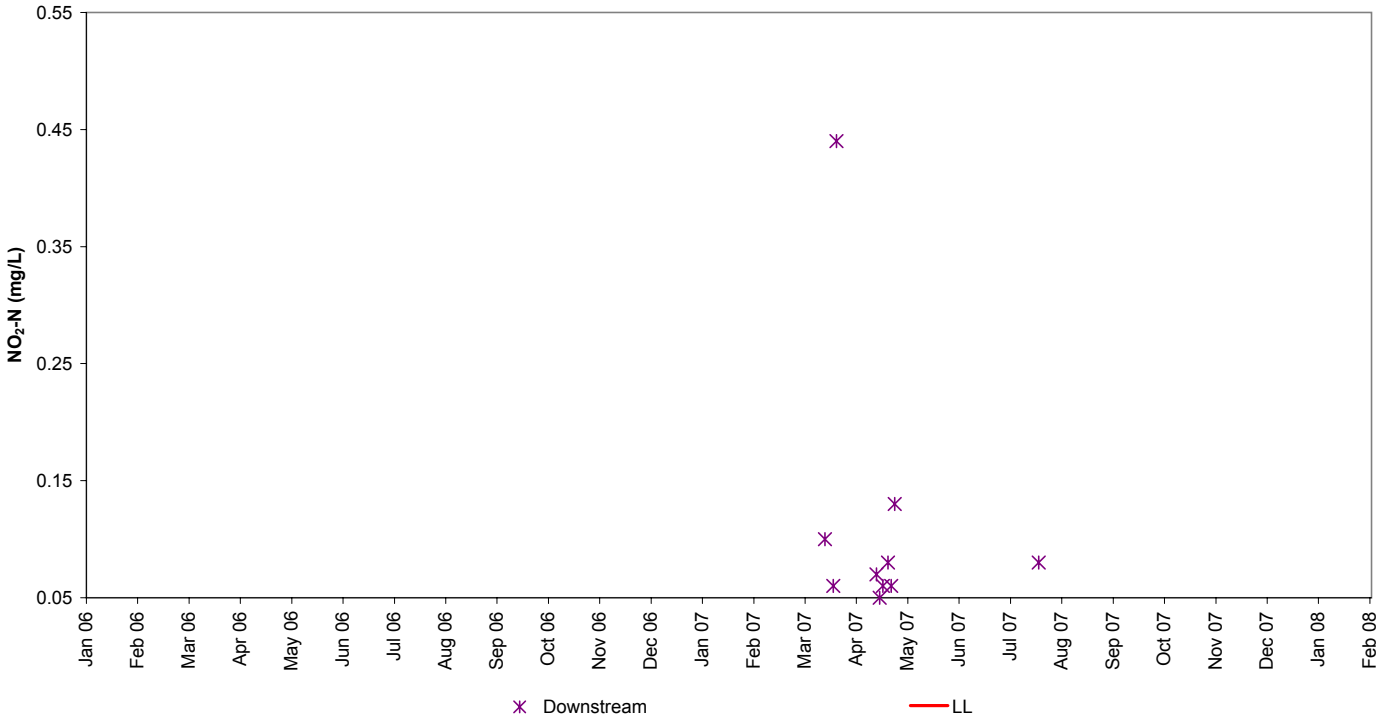
F_Inland M : Nitrate Nitrogen (Large in Scale)



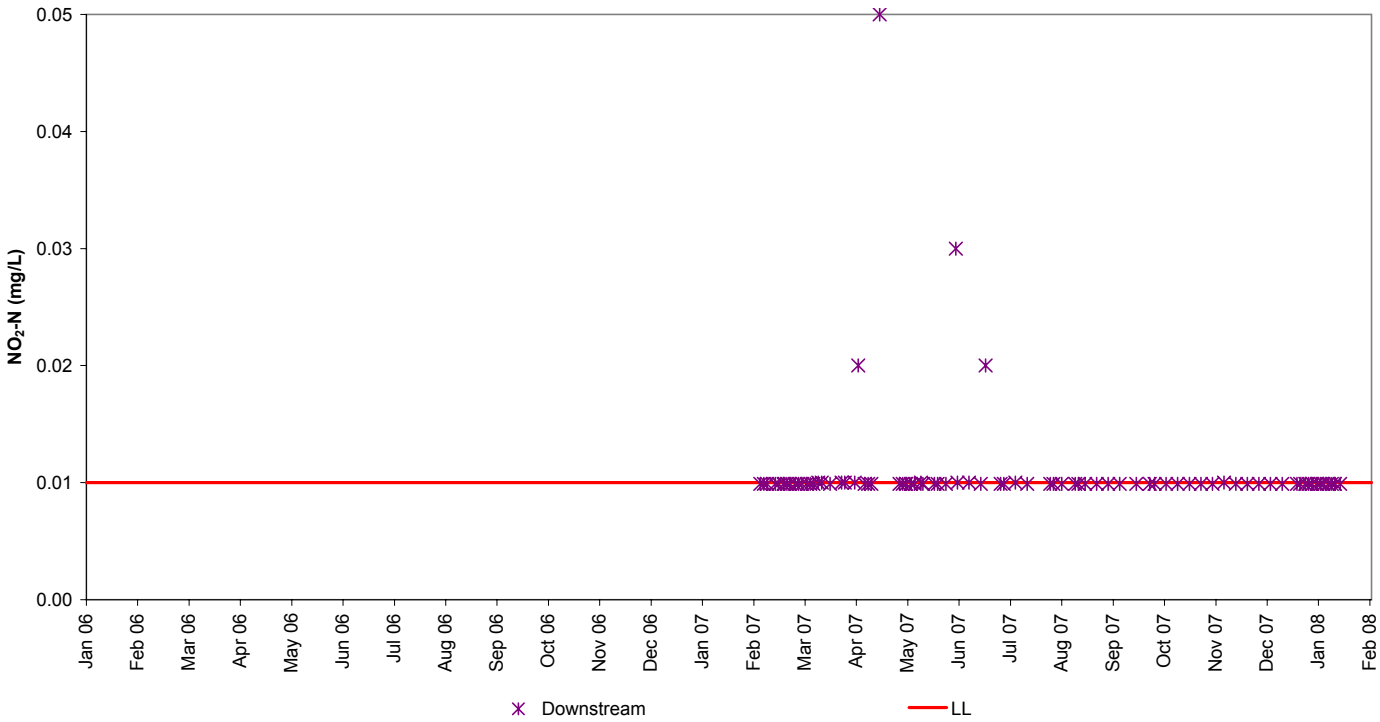
F_Inland M : Nitrate Nitrogen (Normal in Scale)



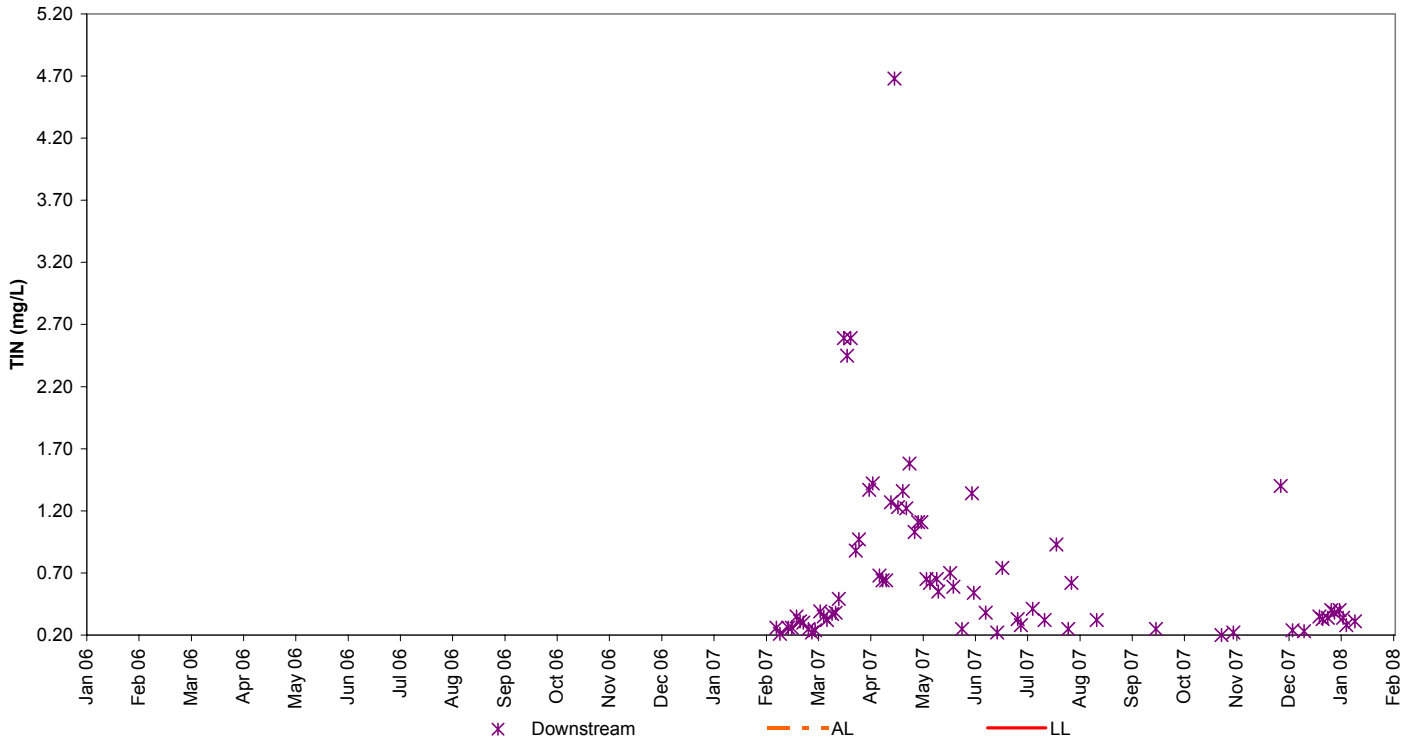
F_Inland M : Nitrite Nitrogen (Large in Scale)



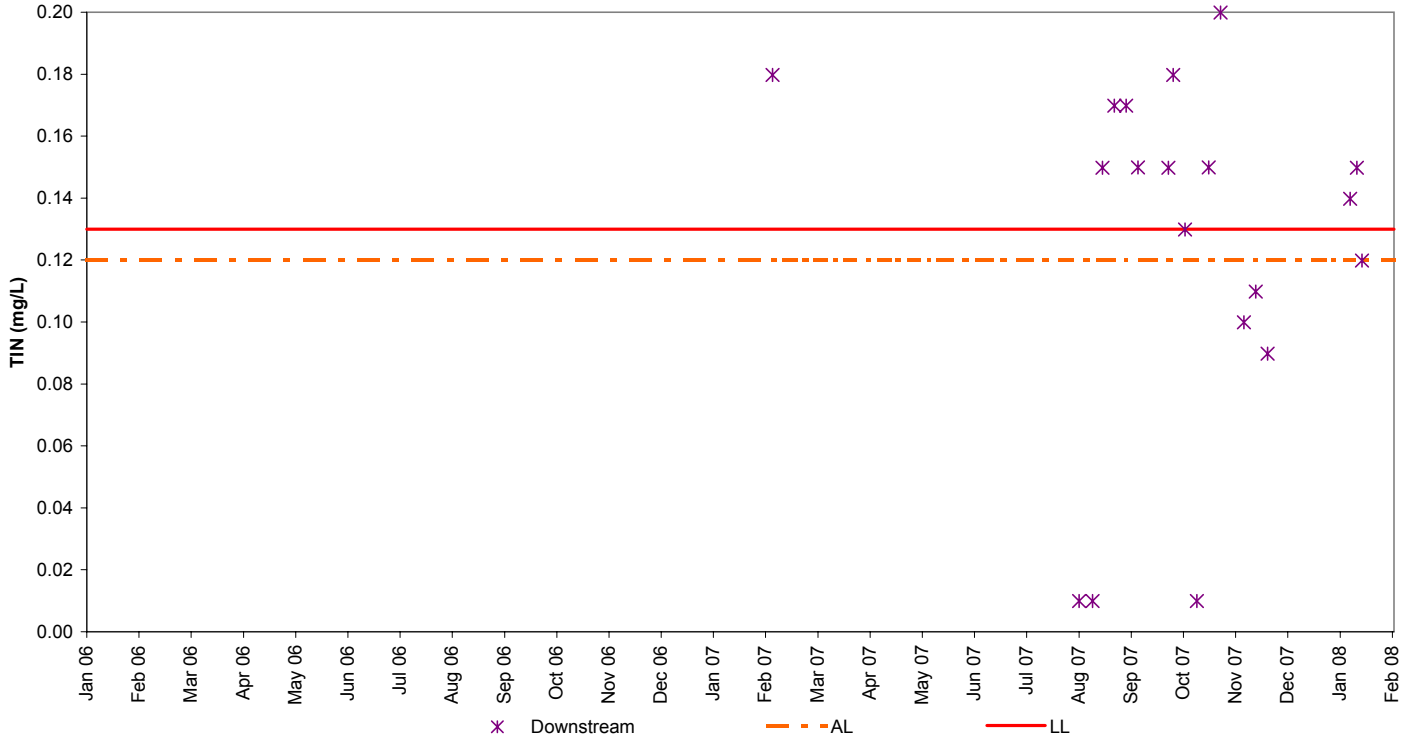
F_Inland M : Nitrite Nitrogen (Normal in Scale)

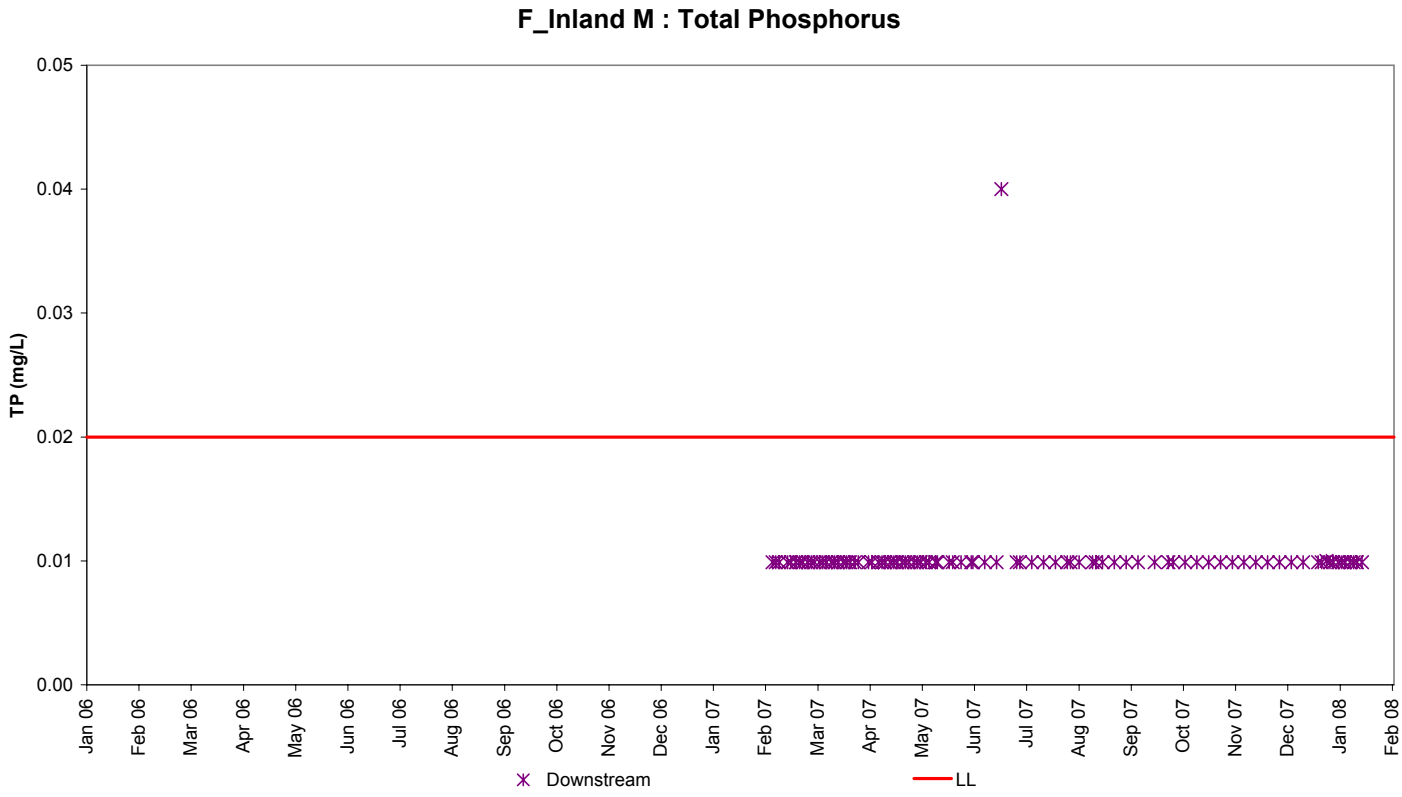


F_Inland M : Total Inorganic Nitrogen (Large in Scale)

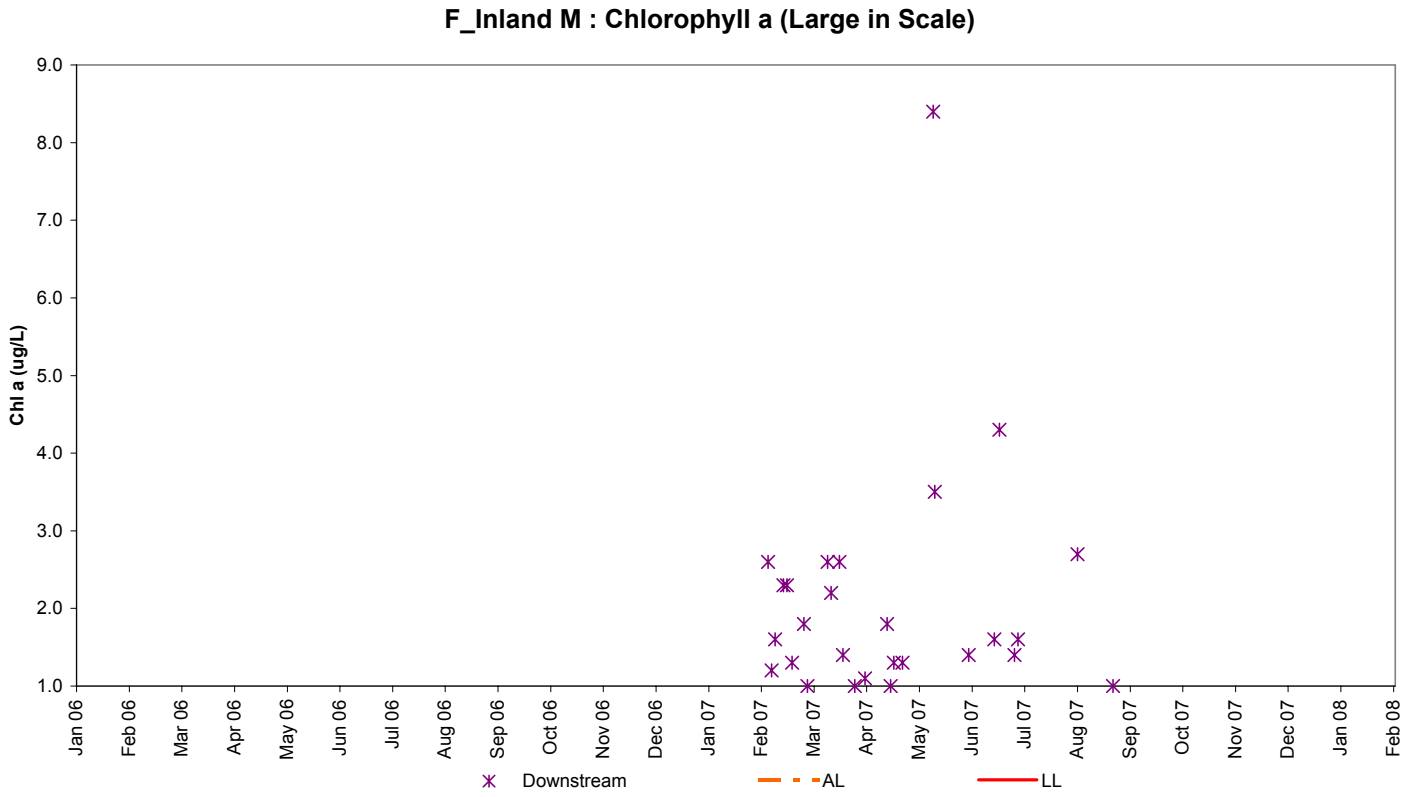


F_Inland M : Total Inorganic Nitrogen (Normal in Scale)





Blank - Not used


F_Inland M : Chlorophyll a (Large in Scale)
Chl a (ug/L)
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
Jan 06
Feb 06
Mar 06
Apr 06
May 06
Jun 06
Jul 06
Aug 06
Sep 06
Oct 06
Nov 06
Dec 06
Jan 07
Feb 07
Mar 07
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May 07
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Jul 07
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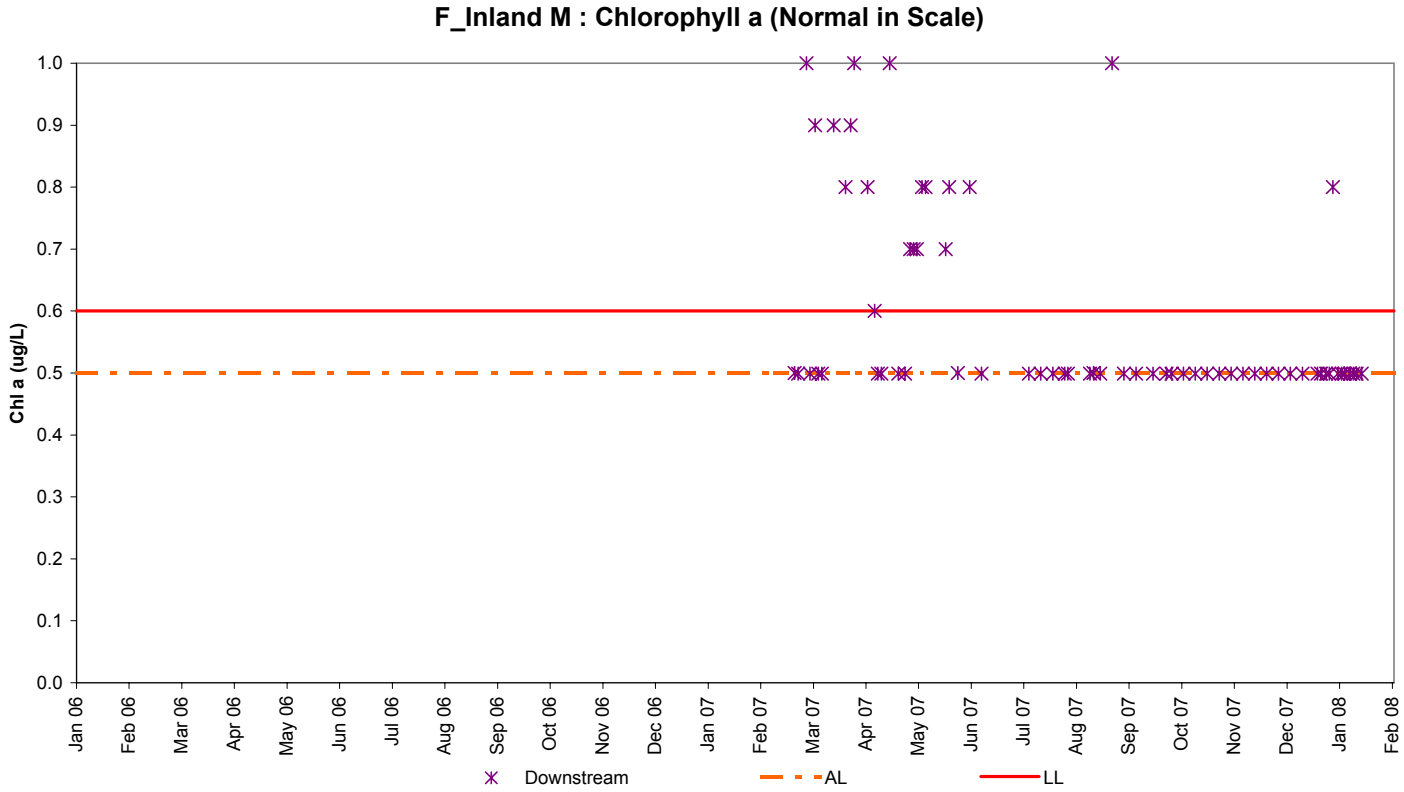
Oct 07
Nov 07
Dec 07
Jan 08
Feb 08
Downstream
AL
LL


F_Inland M : Chlorophyll a (Normal in Scale)
Chl a (ug/L)
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Jan 06
Feb 06
Mar 06
Apr 06
May 06
Jun 06
Jul 06
Aug 06
Sep 06
Oct 06
Nov 06
Dec 06
Jan 07
Feb 07
Mar 07
Apr 07
May 07
Jun 07
Jul 07
Aug 07
Sep 07
Oct 07
Nov 07
Dec 07
Jan 08
Feb 08
Downstream
AL
LL

Water Quality – Monitoring Results for Pesticide Application

Date	Monitoring Station	Parameters	Monitoring Result
2-Jun-07	F_Inland_Marsh, M_Marsh, TTC	Chlorpyrifos	Undetectable
4-Jun-07	F_Inland_Marsh, M_Marsh, TTC	Chlorpyrifos	Undetectable
6-Jun-07	F_Inland_Marsh, M_Marsh, TTC	Chlorpyrifos	Undetectable
8-Jun-07	F_Inland_Marsh, M_Marsh, TTC	Chlorpyrifos	Undetectable
12-Jun-07	M_BP, TTC	Chlorpyrifos	Undetectable
15-Jun-07	F_Inland_Marsh, M_Marsh, TTC	Chlorpyrifos	Undetectable
26-Jun-07	F_Inland_Marsh, M_Marsh, TTC, M_BP	Chlorpyrifos	Undetectable
28-Jun-07	F_Inland_Marsh, M_Marsh, TTC, M_BP	Chlorpyrifos	Undetectable
7-Jul-07	F_Inland M, M_Marsh, TTC, M_BP, M_Coral, F_DB	Chlorpyrifos	Undetectable
13-Jul-07	F_Inland M, M_Marsh, TTC	Chlorpyrifos	Undetectable
13-Jul-07	F_Inland M, M_Marsh, TTC	Ronstar	Undetectable
20-Jul-07	F_Inland_Marsh, M_Marsh, TTC, M_BP	Chlorpyrifos	Undetectable
24-Jul-07	M_BP, TTC	Chlorpyrifos	Undetectable
31-Jul-07	M_BP, M_Coral, TTC, F_DB	Chlorpyrifos	Undetectable
3-Aug-07	M_BP, M_Coral, TTC, F_DB	Chlorpyrifos	Undetectable
3-Aug-07	M_BP, TTC, F_DA	Glyphosate	Undetectable
9-Aug-07	F_Inland M, M_Marsh, TTC, M_BP	Chlorpyrifos	Undetectable
10-Aug-07	M_BP, TTC	Fipronil	Undetectable
15-Aug-07	F_Inland M, M_Marsh, TTC, M_BP	Chlorothalonil	Undetectable
18-Aug-07	M_BP, TTC, F_DA	Chlorpyrifos	Undetectable
20-Aug-07	M_BP, M_Coral, TTC, F_DB	Chlorpyrifos	Undetectable
23-Aug-07	M_BP, TTC, M_Coral, KS, F_DA, F_DC	Chlorpyrifos	Undetectable
28-Aug-07	M_BP, M_Coral, TTC, F_DB	Chlorpyrifos	Undetectable
31-Aug-07	M_BP, TTC	Chlorpyrifos	Undetectable
6-Sep-07	KS, M_BP, M_Coral, TTC, F_DA, F_DC	Chlorpyrifos	Undetectable
8-Sep-07	M_BP, TTC, F_DA	Glyphosate	Undetectable
8-Sep-07	M_BP, TTC, F_Inland_Marsh	Oxadiazon	Undetectable
12-Sep-07	KS, M_Coral, F_DC	Chlorpyrifos	Undetectable
12-Sep-07	M_BP, TTC, F_DA	Glyphosate	Undetectable
12-Sep-07	M_BP, TTC, F_Inland_Marsh	Chlorothalonil	Undetectable
15-Sep-07	KS, M_Coral, F_DC, F_DB	Chlorpyrifos	Undetectable
18-Sep-07	KS, M_Coral, F_DC	Chlorpyrifos	Undetectable
18-Sep-07	M_BP, TTC, F_DB	Glyphosate	Undetectable
19-Sep-07	M_BP, TTC, F_DA	Chlorpyrifos	Undetectable

Date	Monitoring Station	Parameters	Monitoring Result
19-Sep-07	M_BP, TTC, F_Inland_Marsh	Mancozeb	Undetectable
19-Sep-07	M_BP, TTC, F_Inland_Marsh	Fosetyl Aluminum	Undetectable
26-Sep-07	TTC, M_BP,M_Coral, KS, F_DB, F_DC	Chlorpyrifos	Undetectable
28-Sep-07	M_BP, TTC, F_DB	Glyphosate	Undetectable
29-Sep-07	TTC, M_BP,M_Coral, KS, F_DB, F_DC	Chlorpyrifos	Undetectable
29-Sep-07	M_BP, TTC, F_Inland_Marsh	Fipronil	Undetectable
5-Oct-07	F_Inland_Marsh, M_Marsh, TTC	Chlorothalonil	Undetectable
6-Oct-07	F_Inland_Marsh, F_DB, F_DC, M_Marsh, M_BP, M_Coral, TTC, KS	Chlorpyrifos	Undetectable
6-Oct-07	F_Inland_Marsh, F_DB, F_DC, M_Marsh, M_BP, M_Coral, TTC, KS	Chlorothalonil	Undetectable
10-Oct-07	M_BP, TTC	Chlorpyrifos	Undetectable
10-Oct-07	M_BP, TTC	Chlorothalonil	Undetectable
13-Oct-07	M_BP, TTC, F_DB	Chlorpyrifos	Undetectable
16-Oct-07	M_BP, TTC, F_DB	Chlorpyrifos	Undetectable
18-Oct-07	M_BP, TTC, F_DB	Chlorpyrifos	Undetectable
18-Oct-07	M_BP, TTC, F_DA	Glyphosate	Undetectable
27-Oct-07	M_BP, TTC, F_DA	Chlorpyrifos	Undetectable
27-Oct-07	M_Marsh , M_BP, TTC, F_Inland_Marsh	Fipronil	Undetectable
16-Nov-07	F_Inland_Marsh, M_Marsh, TTC, M_BP, M_Coral, KS, F_DB, F_DC	Iprodione	Undetectable
22-Nov-07	M_BP, TTC, F_DA	Fipronil	Undetectable
22-Nov-07	TTC, M_BP, F_DB, KS, M_Coral, F_DC	Chlorothalonil	Undetectable
8-Dec-07	F_Inland_Marsh, M_Marsh, TTC, M_BP, M_Coral, F_DA, F_DB	Iprodione	Undetectable
15-Dec-07	M_BP, TTC, F_Inland_Marsh	Chlorpyrifos	Undetectable
31-Dec-07	TTC, M_BP, F_DB, KS, M_Coral, F_DC	Chlorpyrifos	Undetectable
4-Jan-08	F_Inland_Marsh, M_Marsh, TTC, M_BP, M_Coral, KS, F_DB, F_DC, F_DA	Iprodione	Undetectable
18-Jan-08	F_Inland_Marsh, M_Marsh, TTC, M_BP, M_Coral, KS, F_DB, F_DC, F_DA	Iprodione	Undetectable
18-Jan-08	F_Inland_Marsh, M_Marsh, TTC, M_BP, M_Coral, KS, F_DB, F_DC, F_DA	Chlorpyrifos	Undetectable
29-Jan-08	F_DA, F_Inland_Marsh, M_BP, M_Marsh, TTC	Chlorpyrifos	Undetectable
31-Jan-08	F_DA, M_BP, TTC	Chlorpyrifos	Undetectable
25-Jan-08	F_Inland_Marsh, M_Marsh, TTC, M_BP, M_Coral, KS, F_DB, F_DC, F_DA	Chlorothalonil	Undetectable
31-Jan-08	F_DA, M_BP, TTC	Chlorothalonil	Undetectable

ENOVATIVE
ENVIRONMENTAL TECHNOLOGY

Project: **Proposed Extension of Public Golf Course at Kau Sai Chau Island**

Daily checking and calibration record

Instrument: **YSI 6920 (ENO 003)**

Date	pH checking			DO wet bulb calibration	Turbidity checking		Staff	Remark
	4.0	7.0	10.0		5 NTU	20 NTU		
2/1	4.00	6.99	10.0	100%	4.75	19.8	TK	
4/1	4.10	7.00	9.97	100%	4.87	19.7	TK	
7/1	4.01	6.97	9.93	100%	4.88	20.4	TK	
9/1	4.01	6.89	9.95	100%	5.24	21.0	TK	
11/1	4.01	7.04	9.91	100%	5.16	20.9	TK	
14/1	4.01	7.15	9.90	100%	5.07	20.7	TK	
16/1	3.90	7.11	9.92	100%	5.00	20.7	TK	
18/1	4.01	7.10	9.87	100%	5.20	19.8	TK	
21/1	3.97	7.04	9.94	100%	4.86	19.9	TK	
23/1	4.04	7.06	10.0	100%	4.95	19.6	TK	
25/1	4.00	7.09	10.0	100%	4.99	20.4	TK	
28/1	4.03	7.00	10.1	100%	5.03	21.1	TK	

Ecology

Photos of Stream Habitat (Baseline)

Stream A

Stream A close-up

Stream B

Stream B close-up

Stream C

Stream C close-up

Stream D

Caridina trifasciata in Stream C

Photos of Stream Habitat (December 2007)

Stream A and the buffer zone

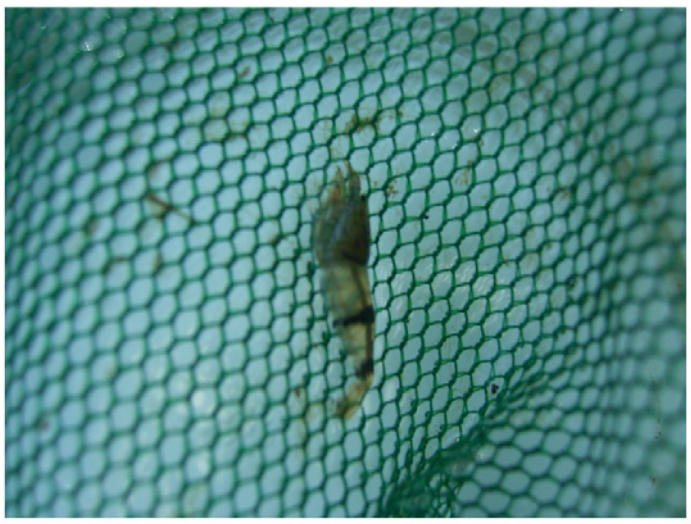
Stream A channel restored by planting & hydroseeding

Buffer zone in Stream B2

Stream B2 course

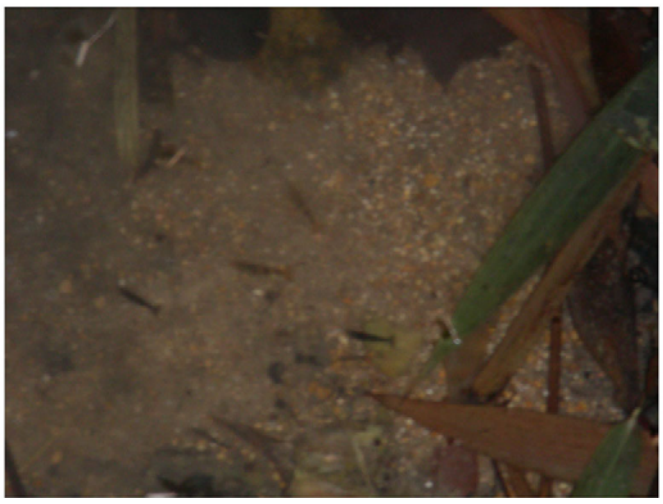
Stream C buffer zone

Stream C course



C. fasciata in Stream C

Area to be reinstated in Stream C



C. fasciata in Stream D

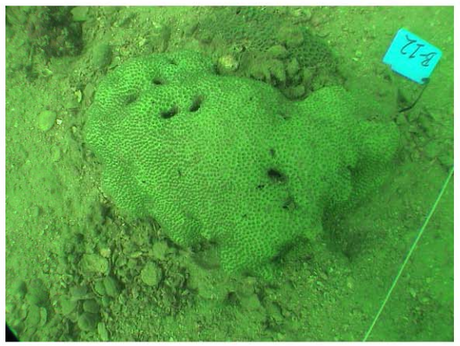
Stream D

Baseline in Dec 05

Month 24 (Dec 07)

B-11

B-12



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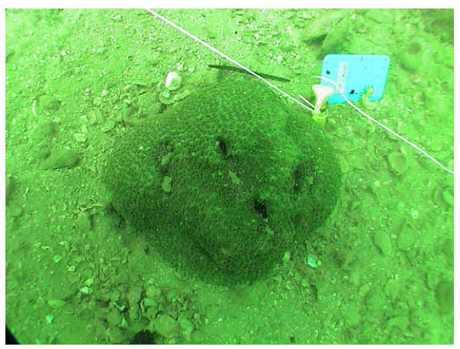

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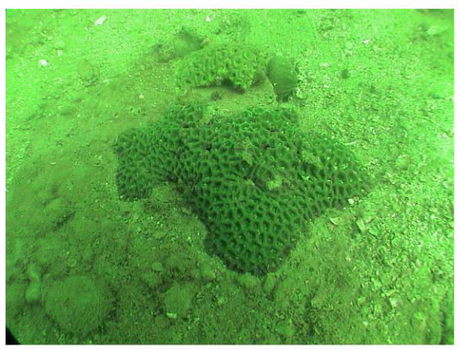
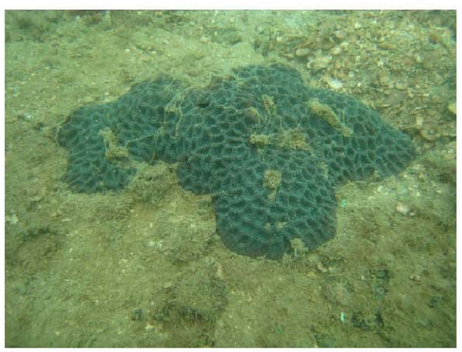




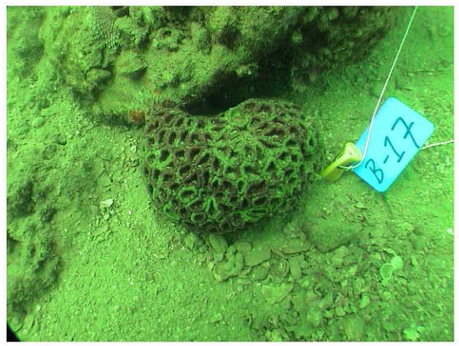
B-15

Baseline in Dec 05

Month 24 (Dec 07)

B-16

B-17



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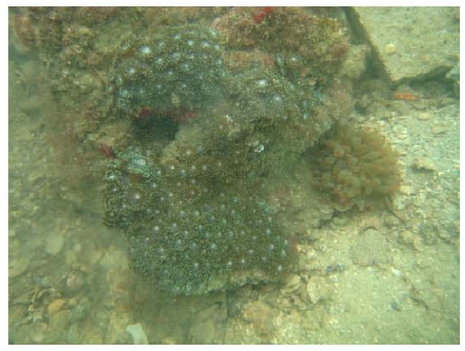

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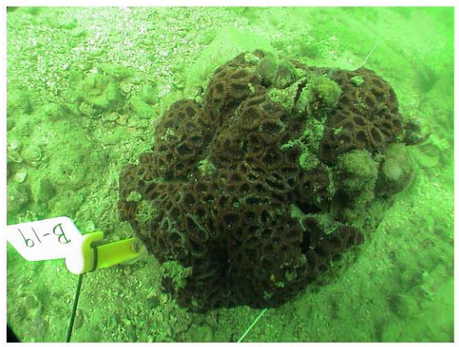

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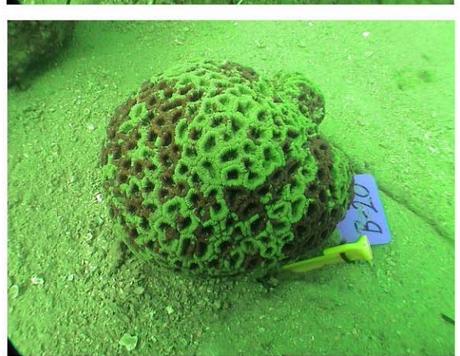


Baseline in April 06

Month 24 (Dec 07)

B-21

B-22

B-23

B-24

B-25

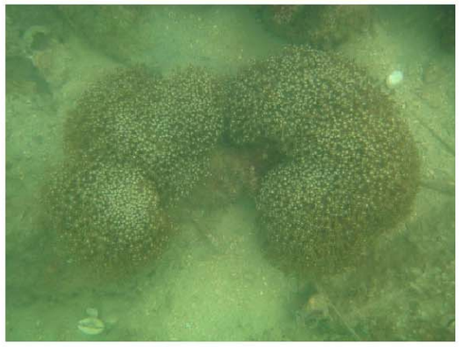
Baseline in April 06

Month 24 (Dec 07)

B-26

B-27

B-28



B-29

B-30

Baseline in April 06

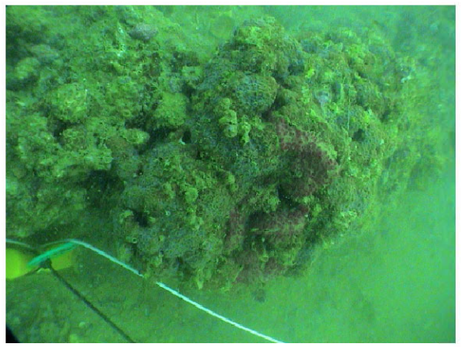
Month 24 (Dec 07)

B-31

B-32

B-33

B-34

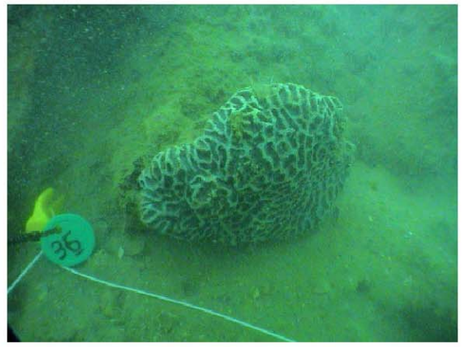


B-35

Baseline in April 06

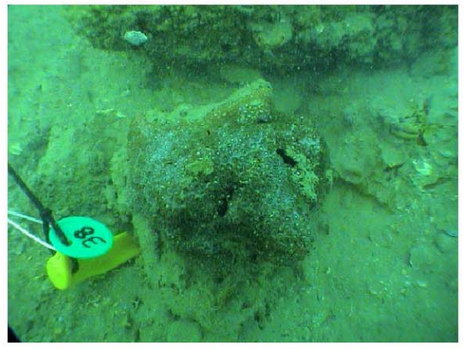
Month 24 (Dec 07)

B-36



B-37

B-38



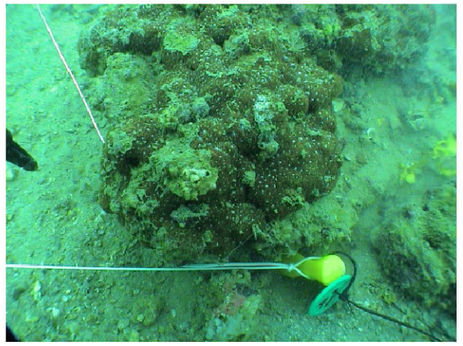
B-39

B-40

Baseline in April 06

Month 24 (Dec 07)

B-41



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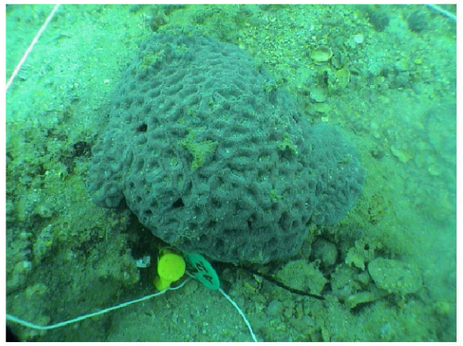
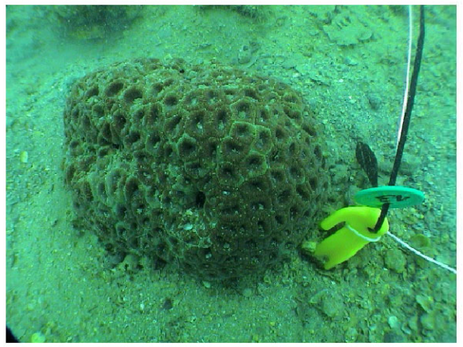
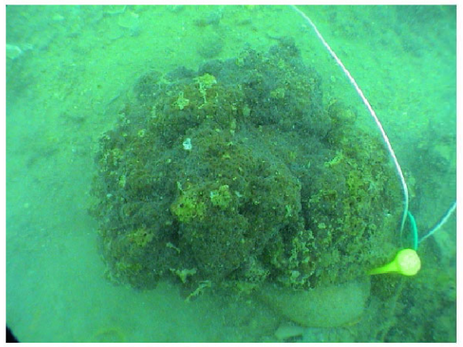


B-43



B-44



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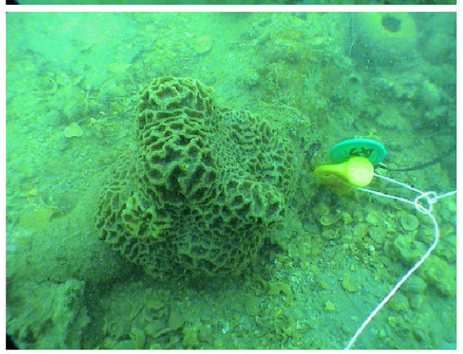


Baseline in April 06

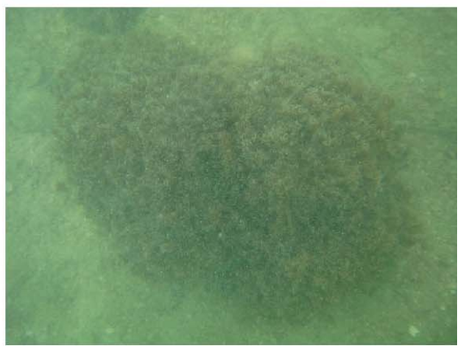
Month 24 (Dec 07)

B-46

B-47

B-48

B-49



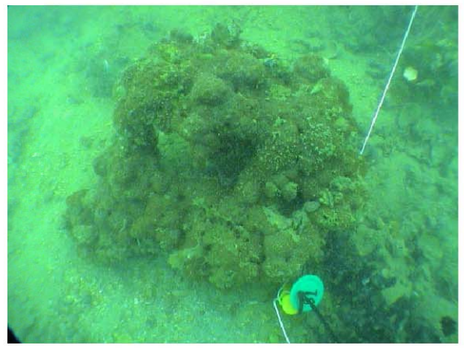
B-50

Missing

Baseline in April 06

Month 24 (Dec 07)

B-51



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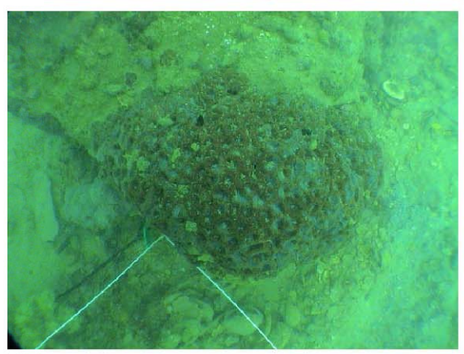
B-53



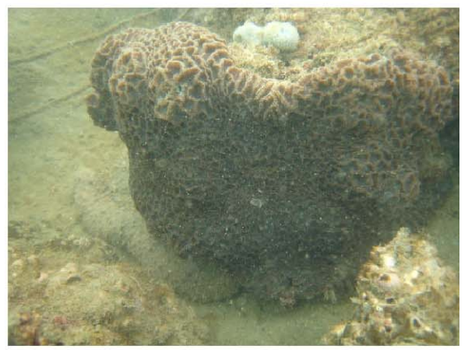
B-54

B-55

Baseline in April 06

Month 24 (Dec 07)

B-56



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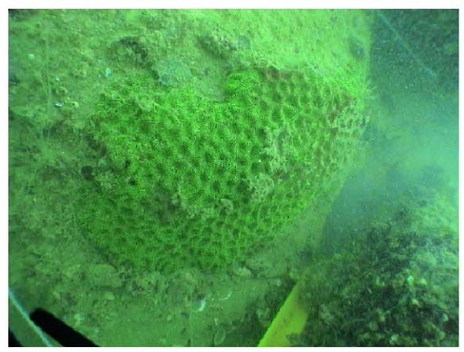


B-58

B-59

Missing

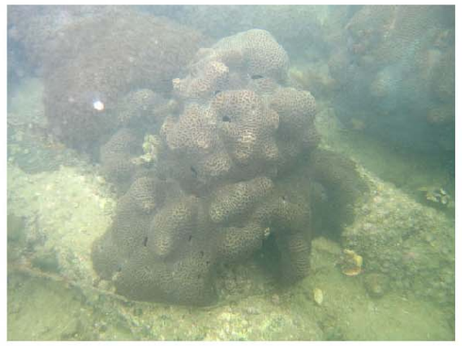
B-60

Missing

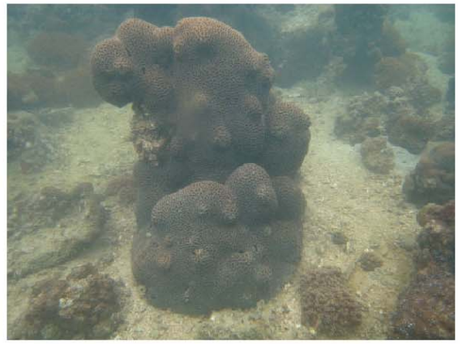
Baseline in Dec 05

Month 24 (Dec 07)

C-01

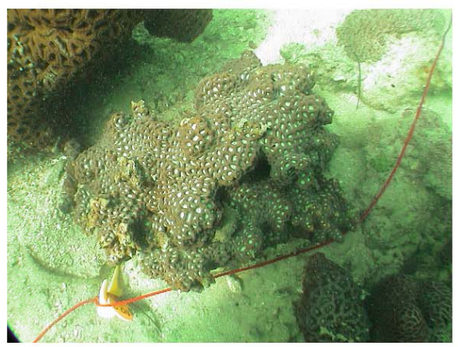


C-02

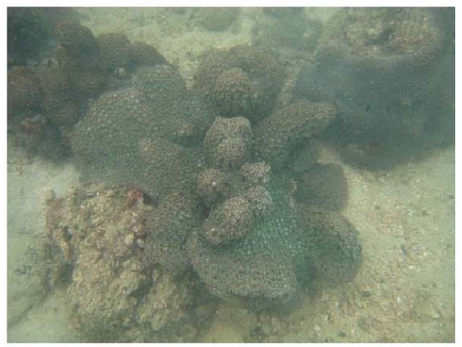


C-03

C-04



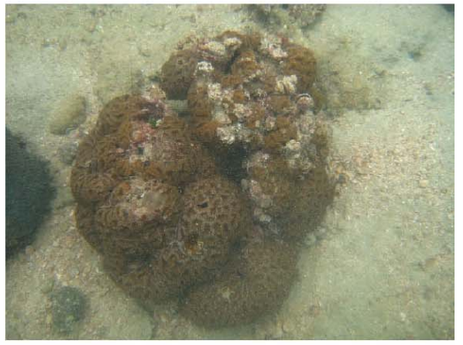
C-05



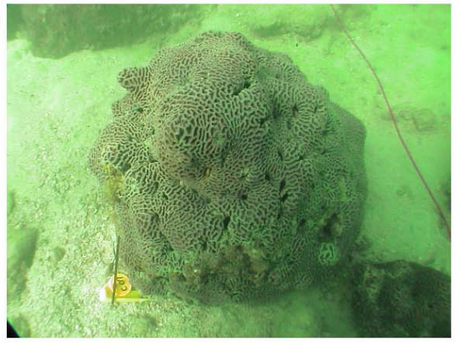
Baseline in Dec 05

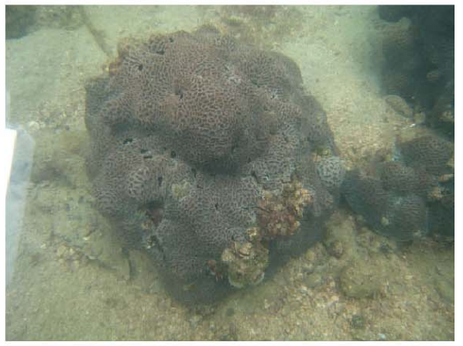
Month 24 (Dec 07)

C-06

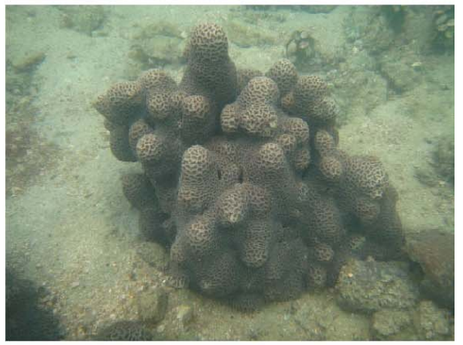


C-07





C-08



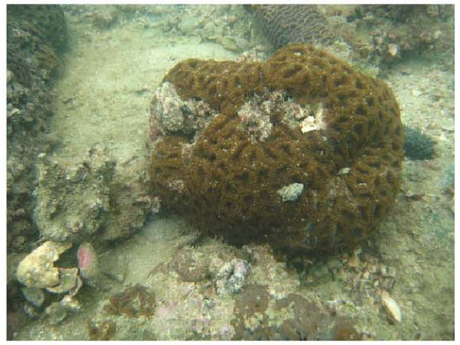
C-09

C-10

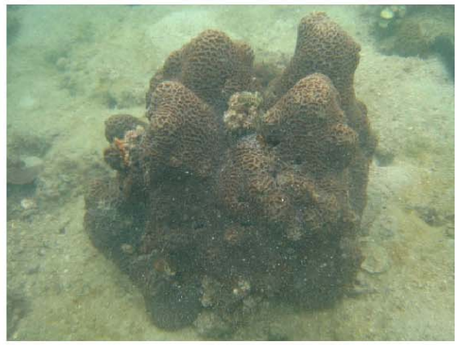
Baseline in Dec 05

Month 24 (Dec 07)

C-11



C-12



C-13

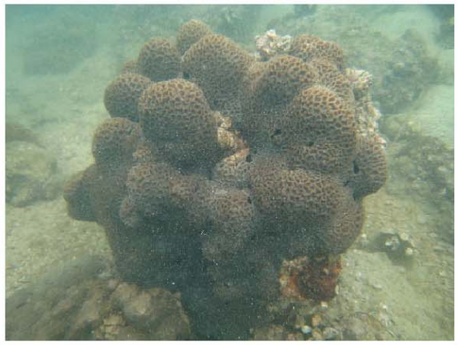
C-14

C-15

Baseline in Dec 05

Month 24 (Dec 07)

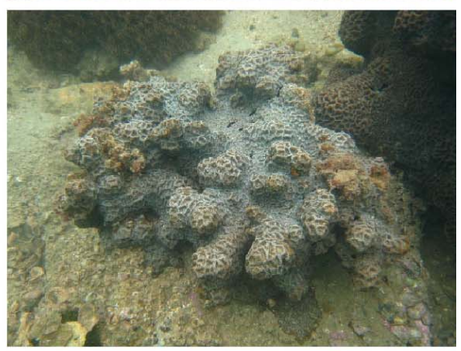
C-16



C-17

C-18

C-19

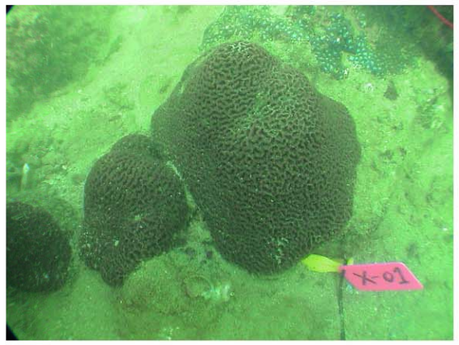


C-20

Baseline in Dec 05

Month 24 (Dec 07)

X-01



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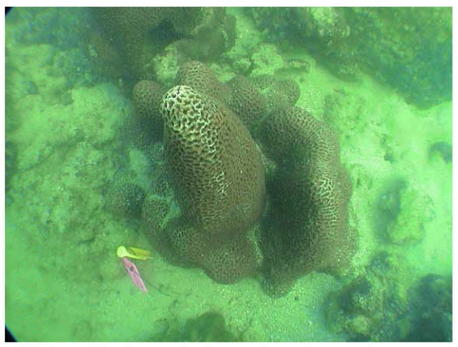

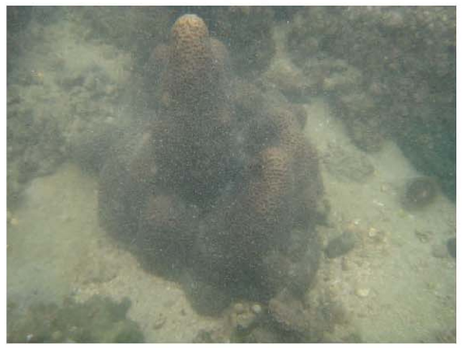

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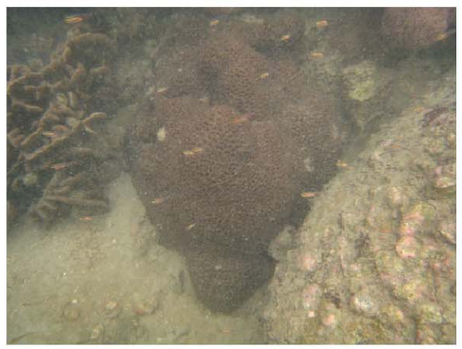

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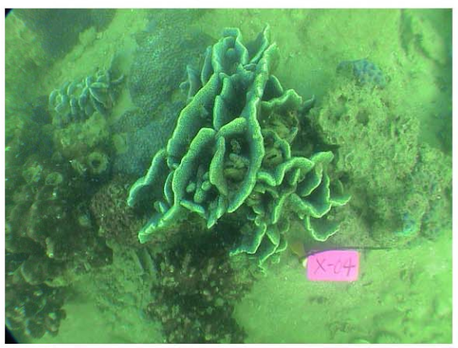

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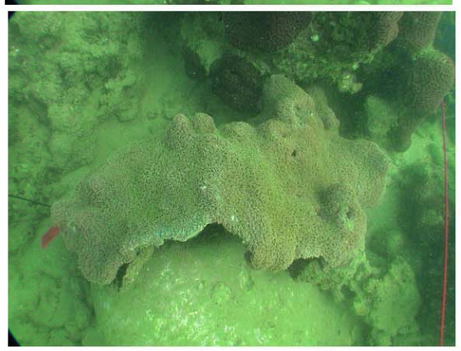

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Month 24 (Dec 07)

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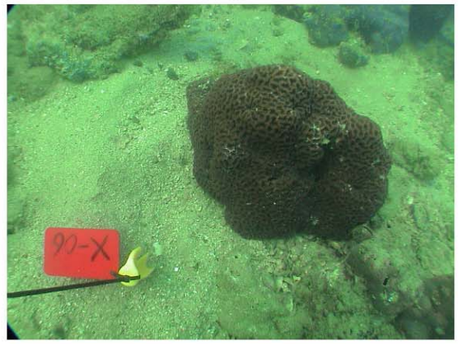

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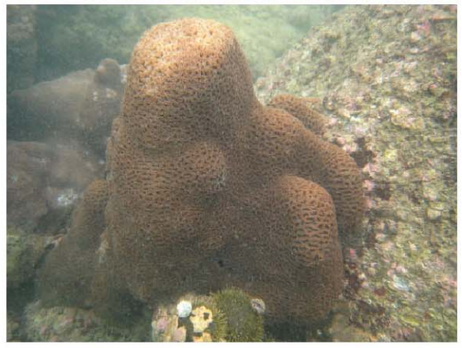

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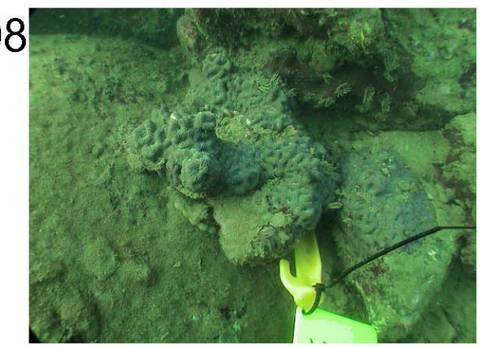

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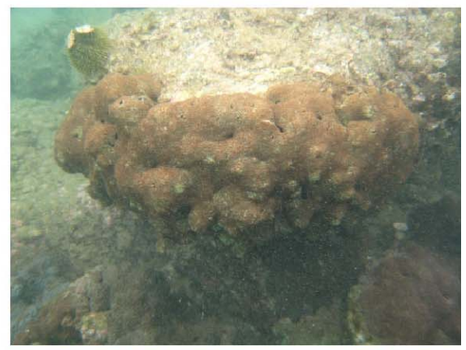

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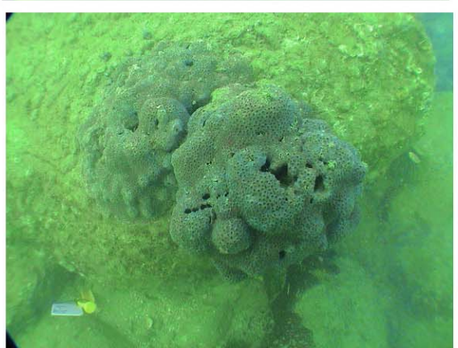

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Month 24 (Dec 07)

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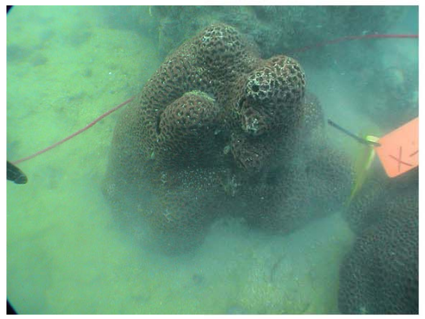

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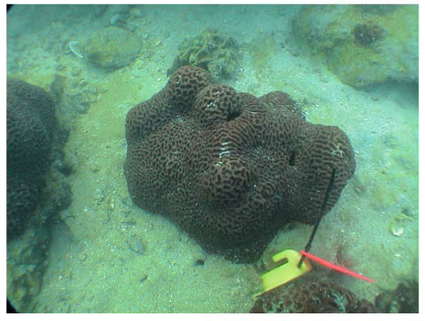

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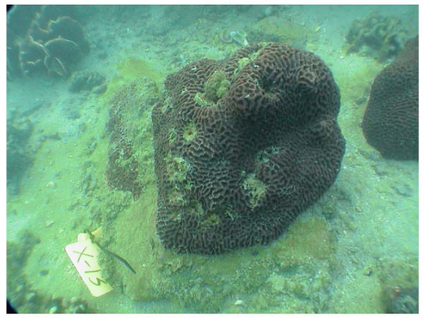

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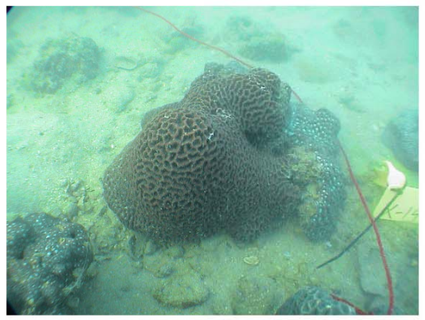

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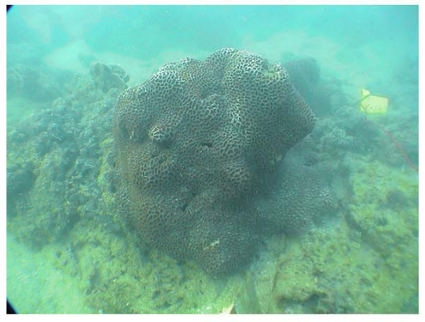

Baseline in Dec 05

Month 24 (Dec 07)

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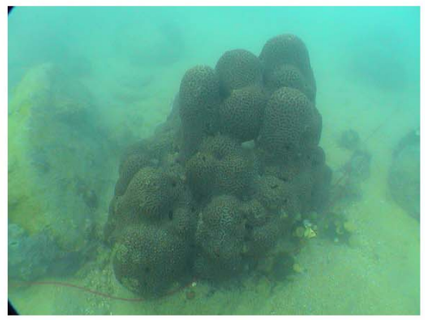

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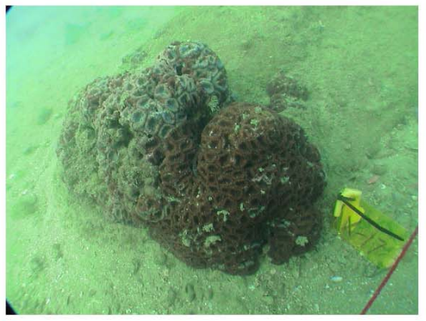

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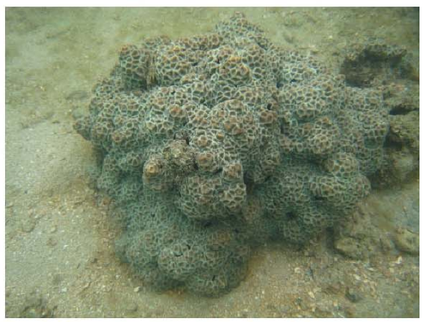

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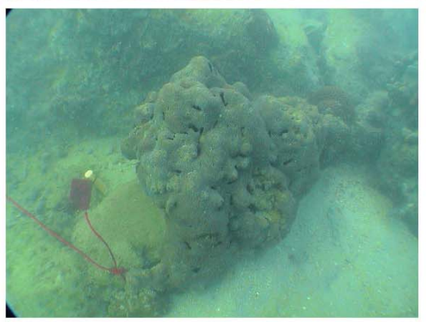
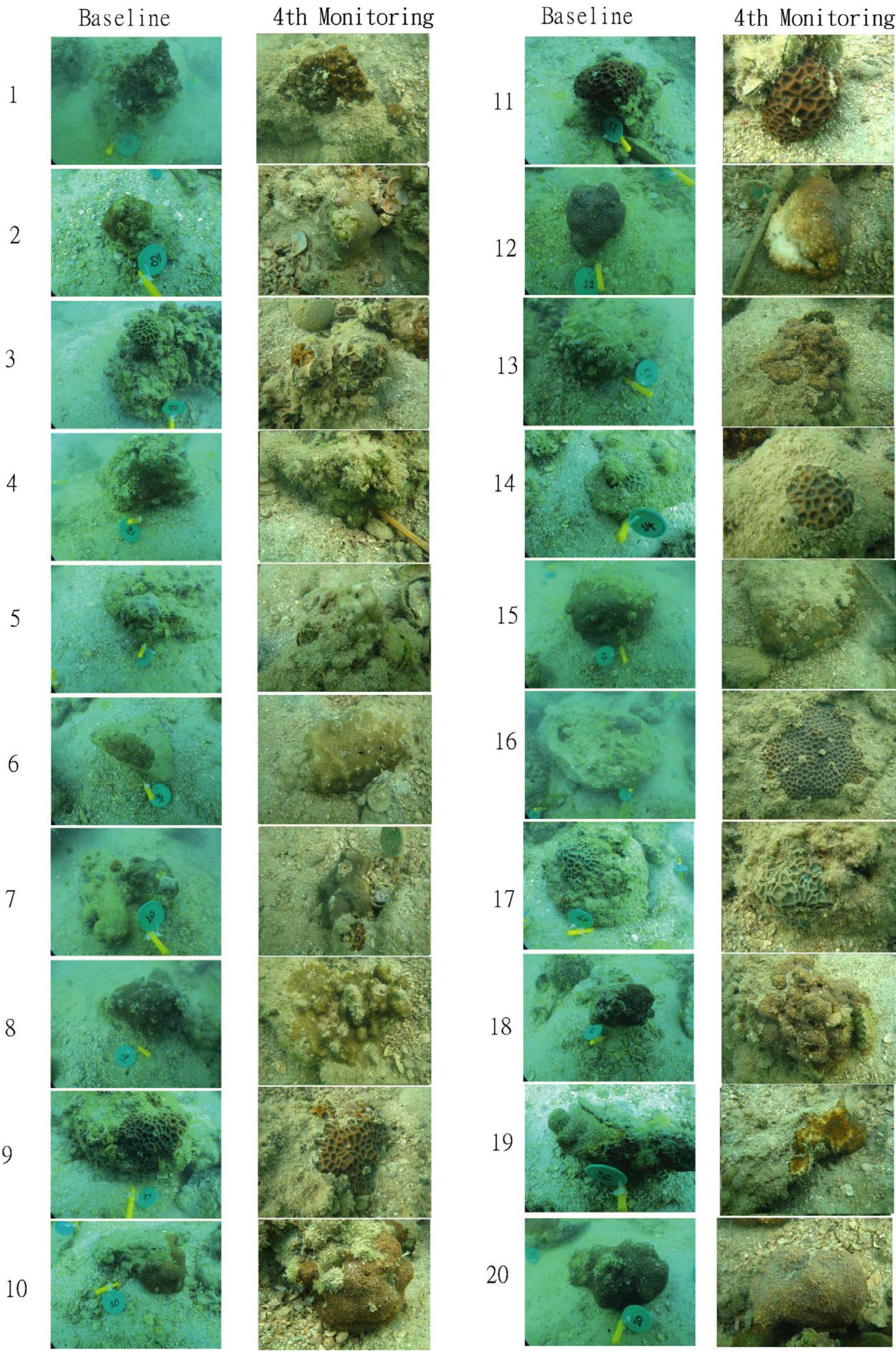


Transplanted Coral



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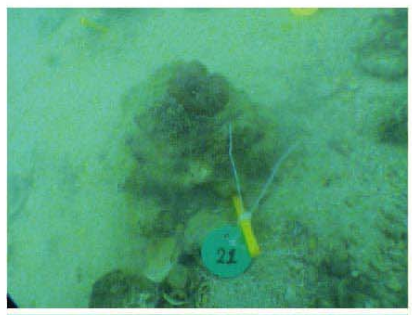
21			31		
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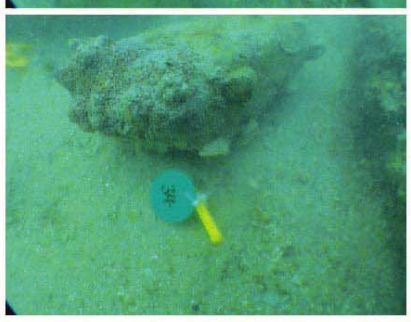
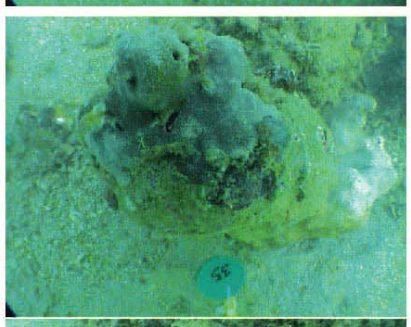
24			34		
25			35		
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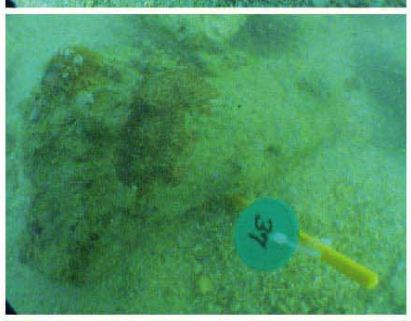
27			37		
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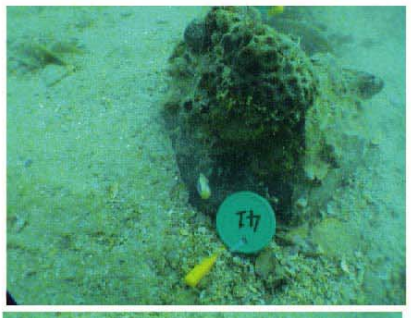
41			51		
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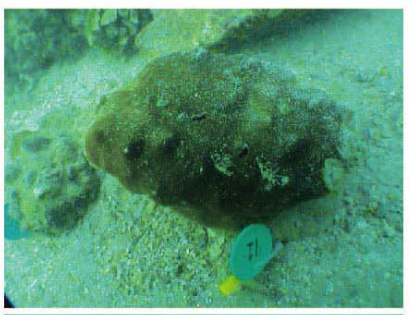
61			71		Missing
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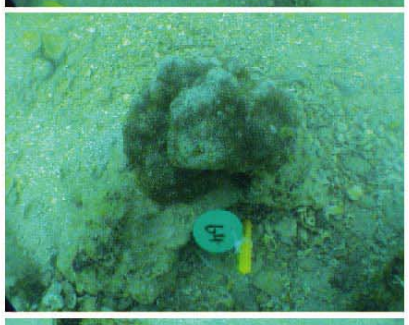
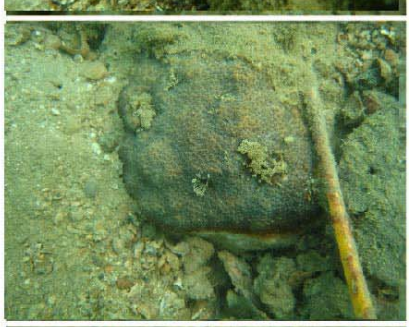
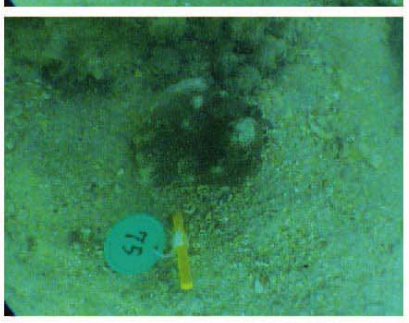
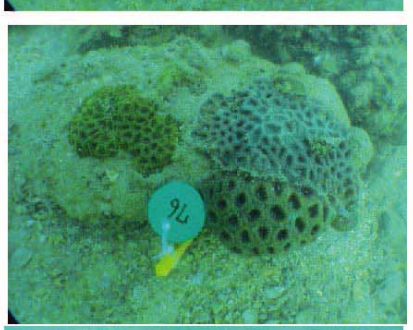
64			74		
65			75		
66			76		
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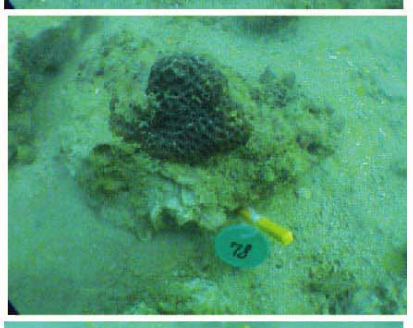
68		Missing	78		
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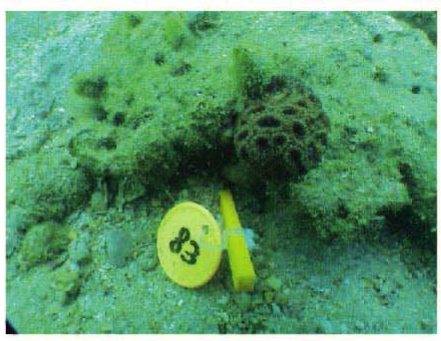
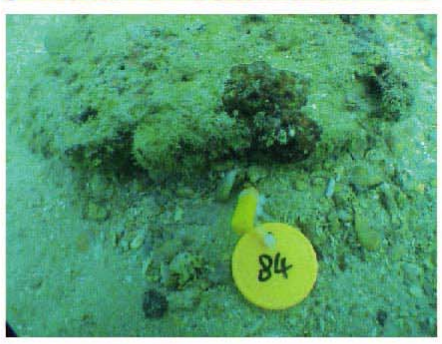
83		
84		
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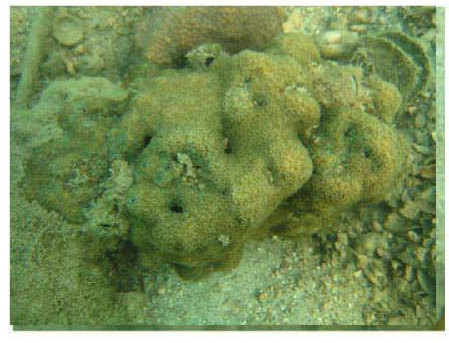
88		
89		

Landscape & Visual

Summary of Site Audit Result

The quality of newly planted standard trees and heavy standard trees are poor. The compensatory trees planting, landscaping trees and shrubs were in progress at December 2007.

No surgery was carried out to the damaged trees next to the administration building after being damaged by the adjacent construction activities. No rectification work had been carried out to the mal-pruning practice of the transplanted trees.

All transplanted trees were in fair condition except for T848. A statement on the cause of death of tree T925 recorded was outstanding.

Construction material was stockpiled within tree protection zones during the administration building extension work and rectified after work completion.

The labels for some of the retained trees were lost and no re-tagging was carried out.

Watering for plants and hydroseeding areas were considered insufficient. More frequent watering for transplanted trees, planted vegetation and hydroseeded areas are required, in particular during dry seasons and newly established plants.

Proposed Tree Planting List at East Course by the Contractor

CODE	BOTANICAL NAME	CHINESE NAME	SIZE	QTY	CODE	SUBSTITUTION	CHINESE NAME	SIZE	COMMENTS FROM RE
AH	*Artocarpus hypargyrea*	白桂木	Standard	28		*Artocarpus nitidus*	紅桂木	Light Standard	
AS	*Aquilarua sinensis*	牙香樹	Light Standard	33	CF	*Castanopsis fissa*	裂斗錐粟		
BT	*Bridelia tomentosa*	逼迫仔	Light Standard	7		Ready in stock			Approved
CB	*Cinnamomum burmannii*	陰香	Heavy Standard	20		Ready in stock			Approved
CC	*Cinnamomum camphora*	樟樹	Heavy Standard	21		Ready in stock			Approved
CL	*Cratoxylum ligustrinum*	黃牛木	Light Standard	4		Ready in stock			Approved
CMI	*Cordia microphylla*	破布木	Light Standard	14	MP	*Mallotus paniculatus*	白楸		No adverse comment
CMY	*Cyclobalanopsis myrsinaefolia*	小葉青岡	Light Standard	38	CF	*Castanopsis fissa*	裂斗錐粟		No adverse comment
CP	*Cinnamomum parthenoxylon*	黃樟	Standard	17		Ready in stock			Approved
CS	*Cassia surattensis*	黃槐	Heavy Standard	4	LF	*Liquidambar formosana*	楓香		
EI	*Erythrina Indica*	花葉刺桐	Standard	17		Ready in stock			Approved
ES	*Erythrina speciosa*	象牙花	Standard	18	EI	*Erythrina Indica*	刺桐		No adverse comment
FB	*Ficus benjamina*	垂葉榕	Heavy Standard	5		Ready in stock			Approved
FSJ	*Ficus superba var. japonica*	筆管榕	Standard	22	CB	*Cinnamomum burmannii*	陰香		No adverse comment
FV	*Ficus variegata*	青果榕	Light Standard	29		*Machilus thunbergii*	紅楠		No adverse comment
GA	*Gordonia axillaris*	大頭茶	700 x 400	30		Ready in stock			Approved
GZ	*Glochidion zeylanicum*	香港算盤子	Light Standard	4	SL	*Sterculia lanceolata*	假蘋婆		No adverse comment
IA	*Ilex asprella*	梅葉冬青	700 x 400	29		Ready in stock			Approved
IV	*Ilex viridis*	亮葉冬青	700 x 400	9	IA	*Ilex asprella*	梅葉冬青		No adverse comment

CODE	BOTANICAL NAME	CHINESE NAME	SIZE	QTY	CODE	SUBSTITUTION	CHINESE NAME	SIZE	COMMENTS FROM RE
LC	*Litsea cubeba*	山蒼樹	Light Standard	28		Ready in stock			Approved
LCL	*Lithocarpus glaber*	柯	Light Standard	5		Ready in stock			Approved
LF	*Liquidambar formosana*	楓香	Heavy Standard	10		Ready in stock			Approved
MA	*Michelia alba*	白蘭	Heavy Standard	5		Ready in stock			Approved
MC	*Machilus chekiangensis*	浙江潤楠	Light Standard	14		*Machilus thunbergii*	紅楠		Approved
MP	*Mallotus paniculatus*	白楸	Light Standard	40		Ready in stock			Approved
MT	*Macaranga tanarius*	血桐	Heavy Standard	21		Ready in stock			Approved
MV	*Machilus velutina*	絨毛潤楠	Standard	24		*Machilus thunbergii*	紅楠		No adverse comment
OE	*Ormosia emarginata*	凹葉紅豆	700 x 400	60	PE	*Phyllanthus emblica*	餘甘子		No adverse comment
PE	*Phyllanthus emblica*	餘甘子	Light Standard	23	PE	*Phyllanthus emblica*	餘甘子	~700 height	No adverse comment
PR	*Plumeria rubra*	雞蛋花	2000 x 800	24		Ready in stock			Approved
RC	*Rhus chinensis*	鹽膚木	Light Standard	25		*Machilus thunbergii*	紅楠		No adverse comment
RCH	*Rhodoleia championii*	吊鐘王	Light Standard	33		Ready in stock			Approved
RI	*Raphiolepis indica*	車輪梅	700 x 400	31		Ready in stock			Approved
RS	*Rhus succedanea*	野漆樹	700 x 400	50	DD	*Dracontomelon duperreanum*		~300 height	No adverse comment
RT	*Reevesia thyrsoidea*	梭羅樹	700 x 400	53	DD	*Dracontomelon duperreanum*		~300 height	No adverse comment
SCU	*Schima superba*	灶地枯骨木	Light Standard	4		Ready in stock			Approved
SD	*Sapium discolor*	山烏桕	Standard	88		Ready in stock			Approved
SO	*Schefflera octophylla*	鴨腳木	Standard	25		Ready in stock			Approved
SS	*Sapium sebiferum*	烏桕	Standard	31	CC	*Cinnamomum camphora*	樟樹		No adverse comment
SSB	*Styrax suberifolius*	紅皮	Light Standard	11	SCU	*Schima superba*	木荷		No adverse comment

CODE	BOTANICAL NAME	CHINESE NAME	SIZE	QTY	CODE	SUBSTITUTION	CHINESE NAME	SIZE	COMMENTS FROM RE
SSU	*Schima superba*	木荷	Standard	11		Ready in stock			Approved
TG	*Ternstroemia gymnanthera*	厚皮香	700 x 400	2	SCU	*Schima superba*	木荷		No adverse comment

Archaeology

Summary of Archaeological Watching Brief

The Archaeological Watching Brief (AWB) consists of 18 days of on-site monitoring of the construction work. An initial site visit was made on 20th January 2006 to inspect preliminary vegetation clearance at Hole 2. The second site visit was undertaken on 3rd February 2006. The first day of the monitoring was agreed on 14th February 2006 after the confirmation with the Contractor that the bulk excavation was being carried out at Hole 2. The site visit at Holes 11, 12, 14, 15 & 16 were started from September 2006 once vegetation clearance commence and completed in January 2007. Four quarterly reports were submitted and approved by AMO.

Watching Brief monitoring results were shown as follows:

Hole 2

Clearance of surface soil was monitored in Areas 1 and 2 (mainly the concrete batching plant and underground water tank location) which is around 60% of the actual bulk earthwork. All monitoring areas were investigated after vegetation clearance and no archaeological material was identified in the first quarterly report. A thirty minute video of the works was recorded. No works have been undertaken outside the Areas 1 and 2 up the reporting period (January to March 2006). No archaeological material was identified. The archaeological watching brief at Hole 2 was completed in February 2007.

Holes 11, 12, 14, 15 & 16

For the excavation at AWB concern areas (Holes 11, 12, 14, 15 & 16), the excavation programme was commended in early September 2006 after the completion of temporary bridges construction at Streams B1 and B2. Vegetation clearance was started in early September 2006 and completed in January 2007 at Holes 11, 12, 14, 15 & 16. Bulk earthwork at concerned watching brief area was concentrated Holes 11, 12, 14 and 16. No archaeological material was identified.

A final report was submitted and approved by AMO in July 2007.

Summary of Cartographic and Photographic Survey at Grave No. G20

According to EIA and EM&A requirement, Grave No.1 should be preserved in-situ with the provision of three meter buffer zone around the grave located at Hole 12 fairway, while Grave No.5 and Grave No.20 should be preserved by record.

During construction phase, Grave No.5 was preserved in-situ located at Hole 12 tee after the golf course design was finalized instead of preservation by record. No cartographic and photographic survey was required.

For Grave No.20 located at Hole 2 fairway, it was preserved by record. The survey was carried out on 23rd October 2006 in compliance with the preservation by record requirements of Antiquities and Monuments Office, LCSD. The Grave was identified during the CHIA during the EIA stage, it was determined that it would not be possible to preserve the grave in-situ. Thus, a survey was conducted, following the AMO requirements for cartographic and photographic survey of historical graves. The report was submitted to AMO in November 2006 for record.

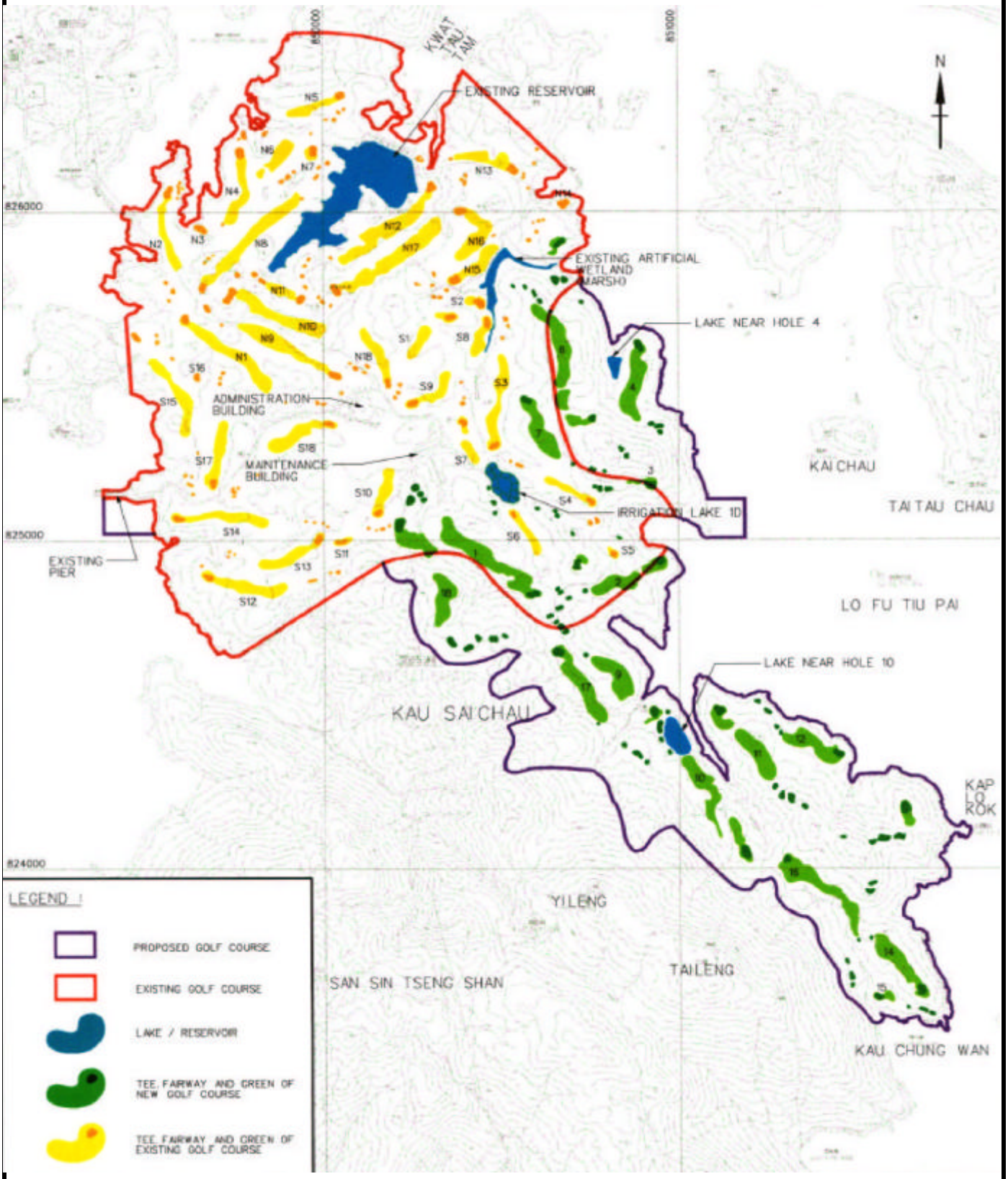
Land Contamination

Summary of Land Contamination

The Contamination Assessment Plan (CAP) was approved by EPD on 17th February 2006. Site investigation was carried out on 14th and 15th February 2006. Site audit was carried out with IEC on 14th February 2006 with the Contractor's representatives. The CAP was approved on 17th February 2006. The Contamination Assessment Report (CAR) and Remediation Action Plan (RAP) were approved on 18th August 2006.

Remedial work for the contaminated soil located at the Hotspot L3 (Hole 18) is required to be implemented properly according to the RAP. A confirmation pilot trial on the ratio of cement and contaminated soil was carried out in September 2006. The contaminated soil was transferred from Hole 18 cutting area to Hole 17 filling area as general fill material and remediate in according to the approved RAP. The full scale remediation work was carried on 4th October 2006. A Final Site Remediation Report (FSRR) was submitted to EPD on December 2006 and approved by EPD on January 2007. No further remediation work was required.

FIGURES



香港賽馬會
The Hong Kong Jockey Club

BLACK & VEATCH HONG KONG LIMITED
博威工程顧問有限公司

Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung

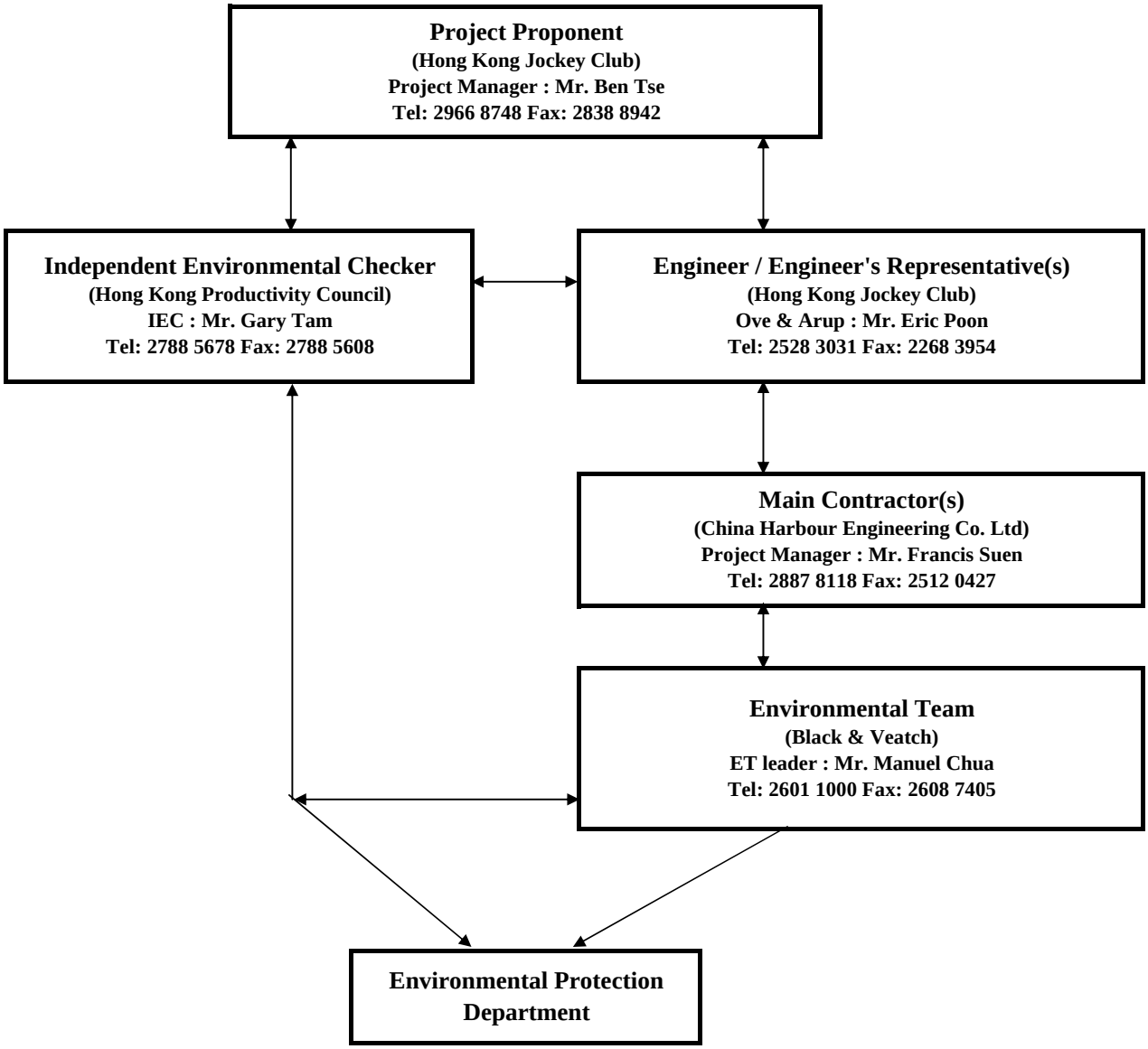
Master Layout Plan of Third Golf Course

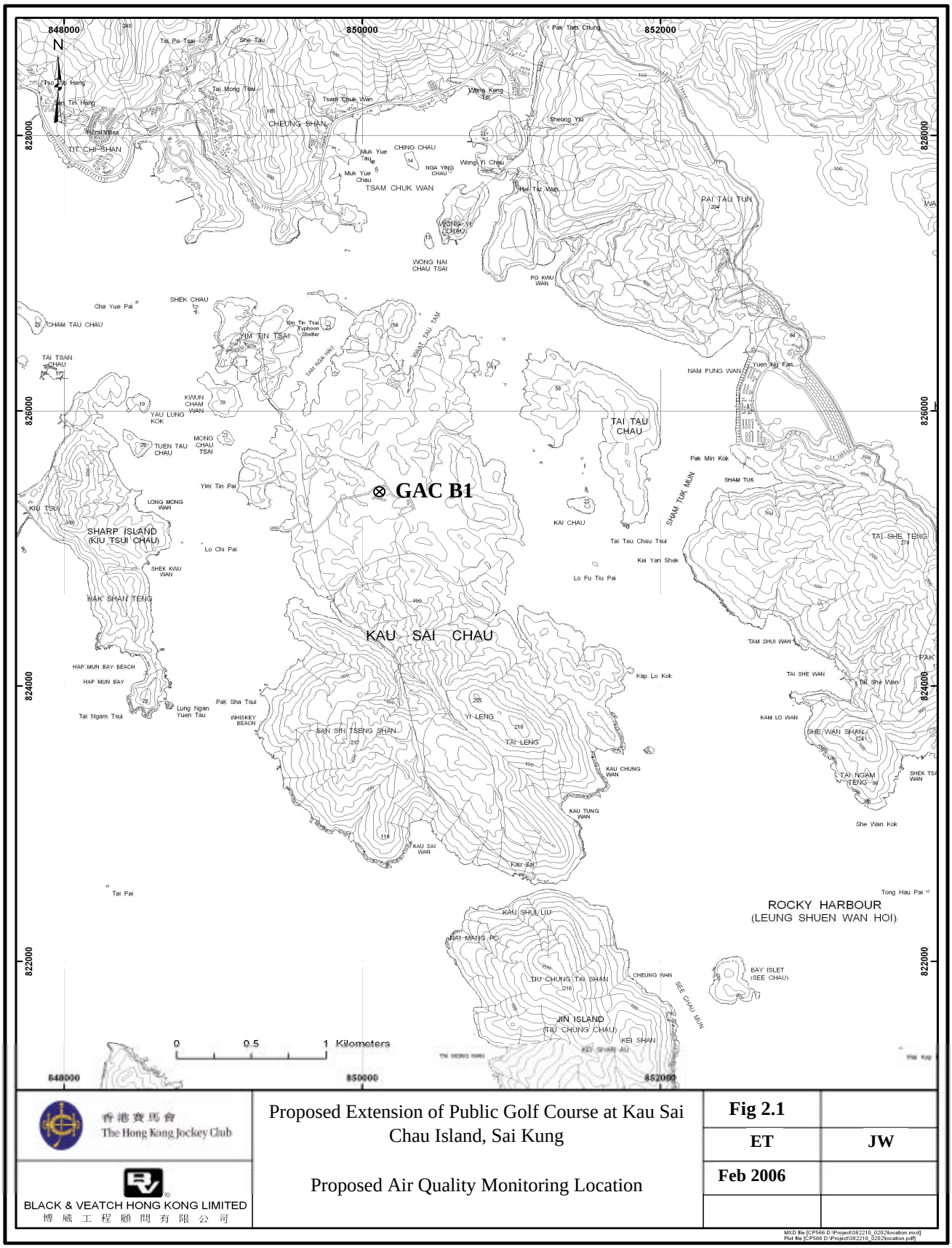
Fig 1.1

Prepared	Checked
ET	JW

Date
Feb-06

Figure 1.2
Project Organisation and Lines of Communication





香港賽馬會 The Hong Kong Jockey Club BLACK & VEATCH HONG KONG LIMITED 博威工程顧問有限公司	Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung Proposed Air Quality Monitoring Location	**Fig 2.1**	
		ET	**JW**
		Feb 2006	

MXD file [CP566 D:\Project\382210_0202\location.mxd]
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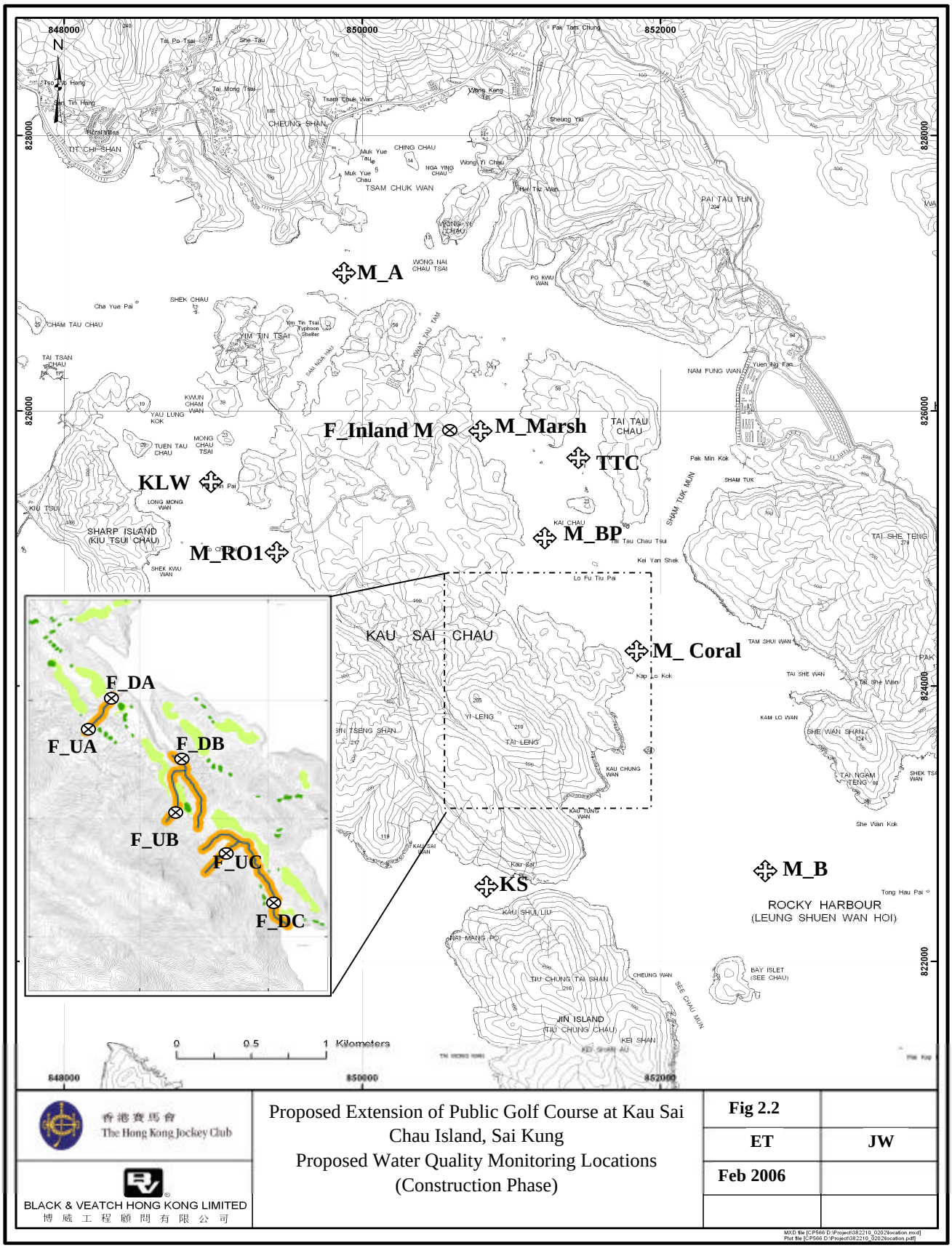

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Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung
Proposed Water Quality Monitoring Locations (Construction Phase)

Fig 2.2	
ET	JW
Feb 2006	

MXD file [CP566 D:\Project\382210_0202\location.mxd]
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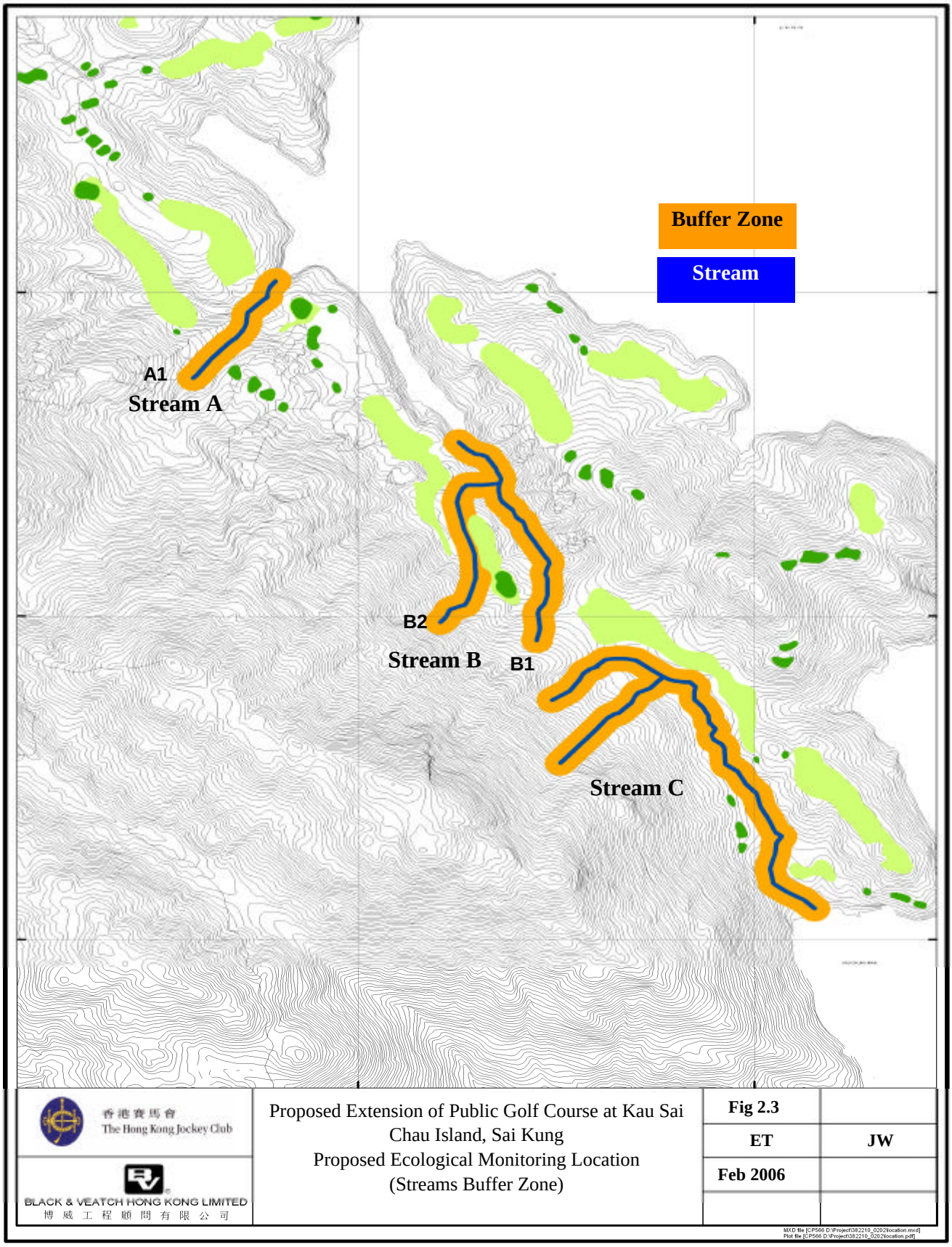

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Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung
Proposed Ecological Monitoring Location
(Streams Buffer Zone)

Fig 2.3	
ET	JW
Feb 2006	

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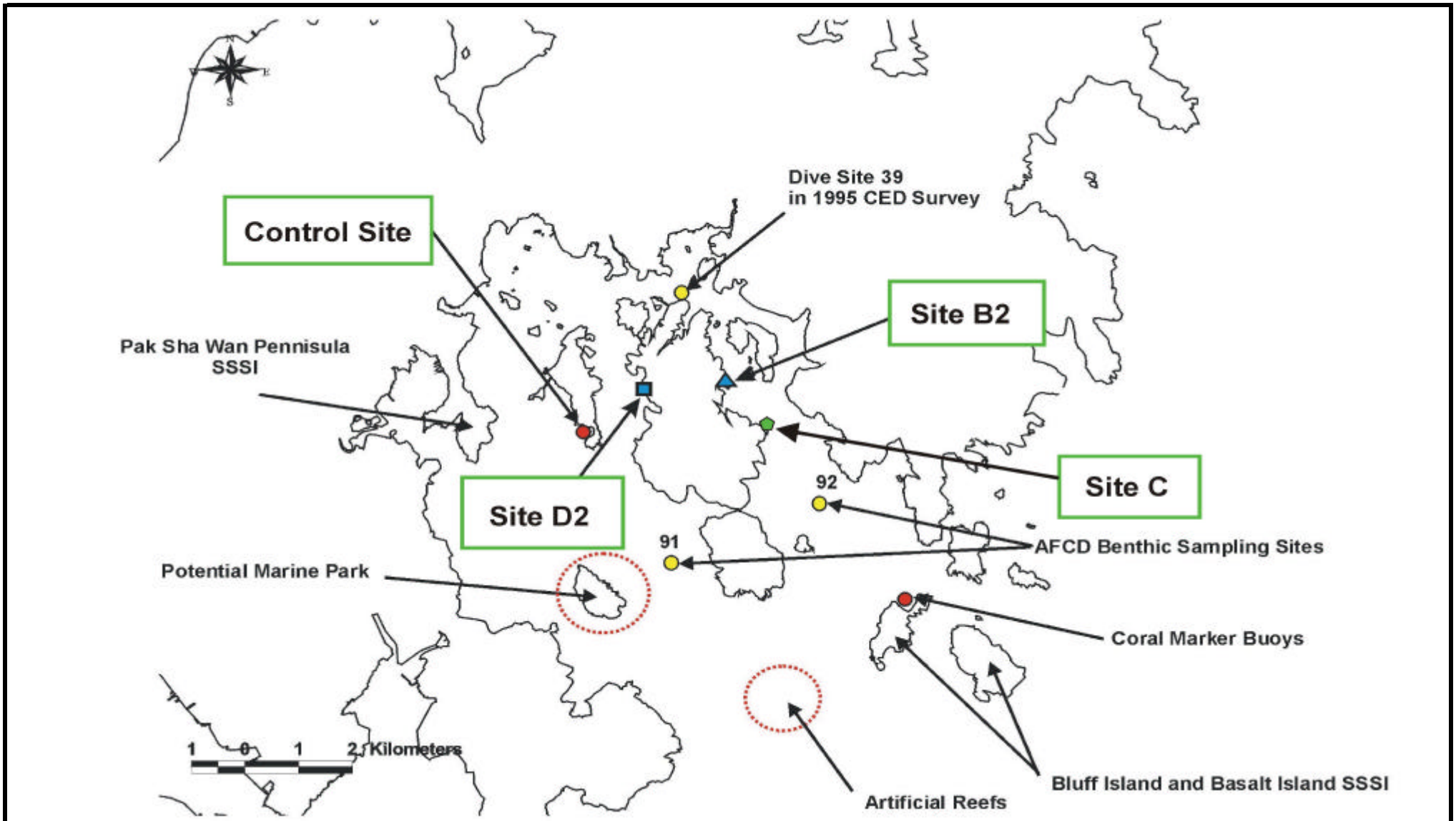

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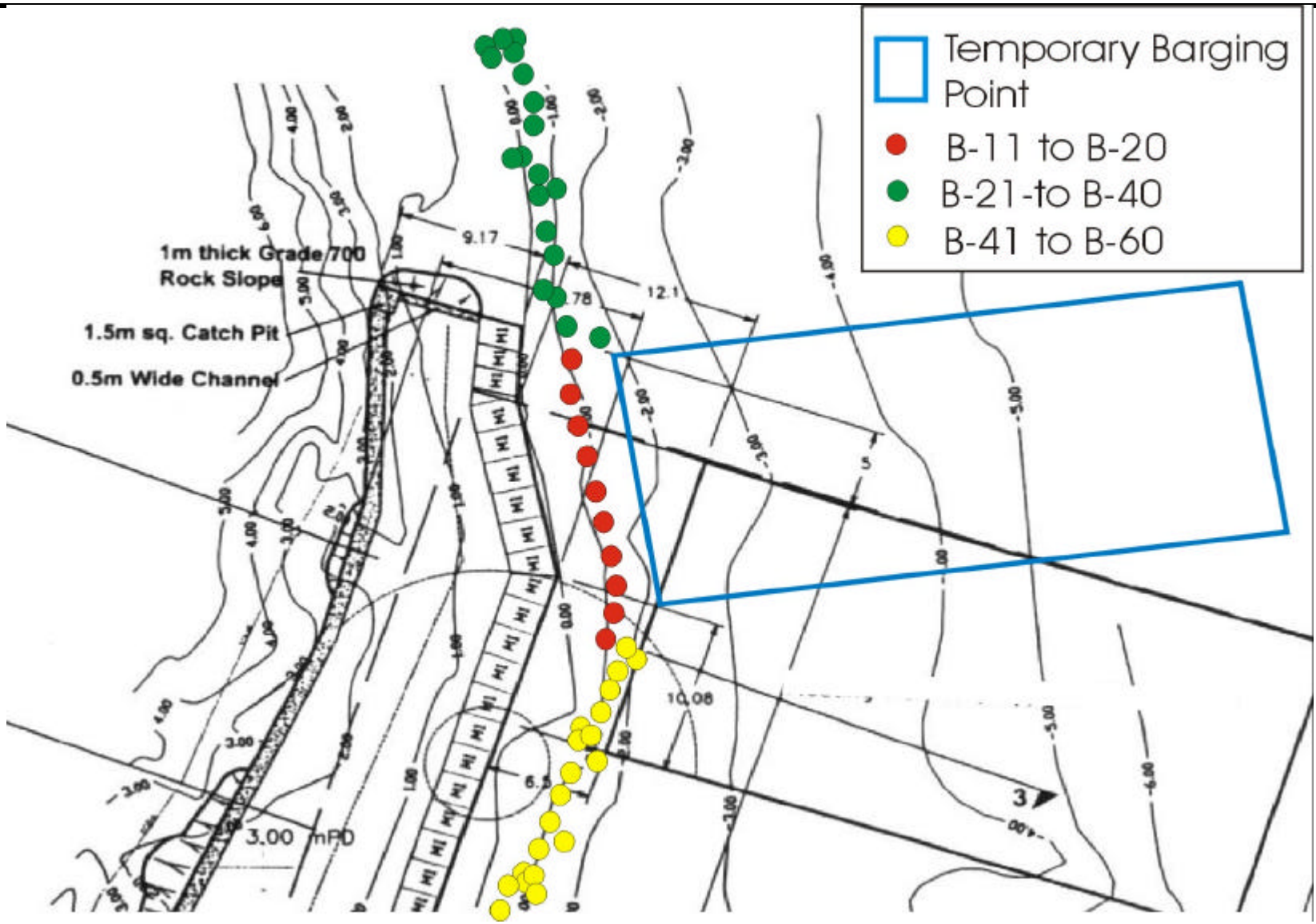
Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung

Location of coral and seagrass monitoring (Sites D2, D3, C and Control)

Fig 2.4a

Prepared	Checked
ET	JW

Date
Feb-06



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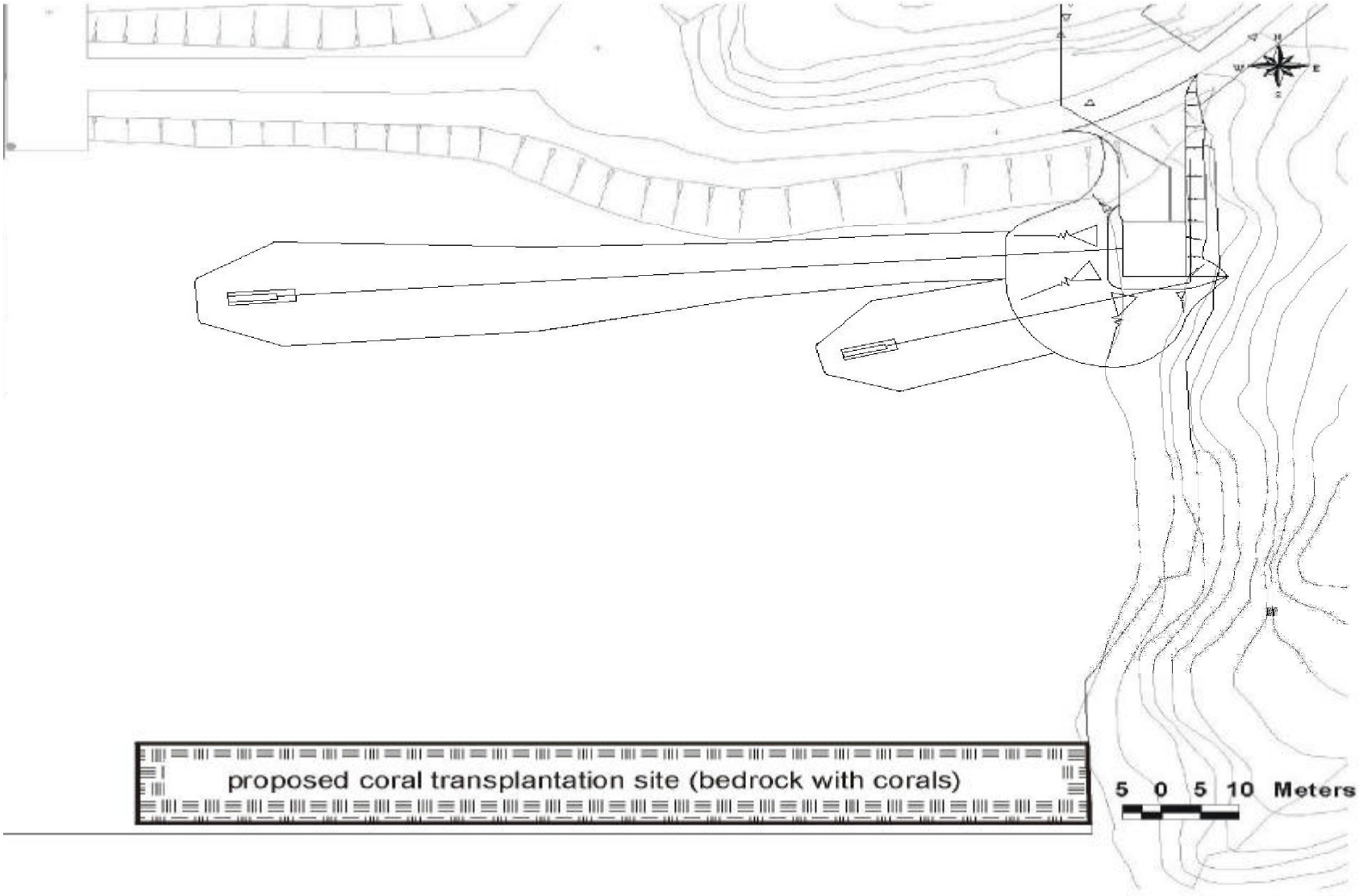
Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung

Indicative Locations of the Tagged Corals at Site B2
under revised monitoring regime

Fig 2.4b

Prepared	Checked
ET	JW

Date Feb-06



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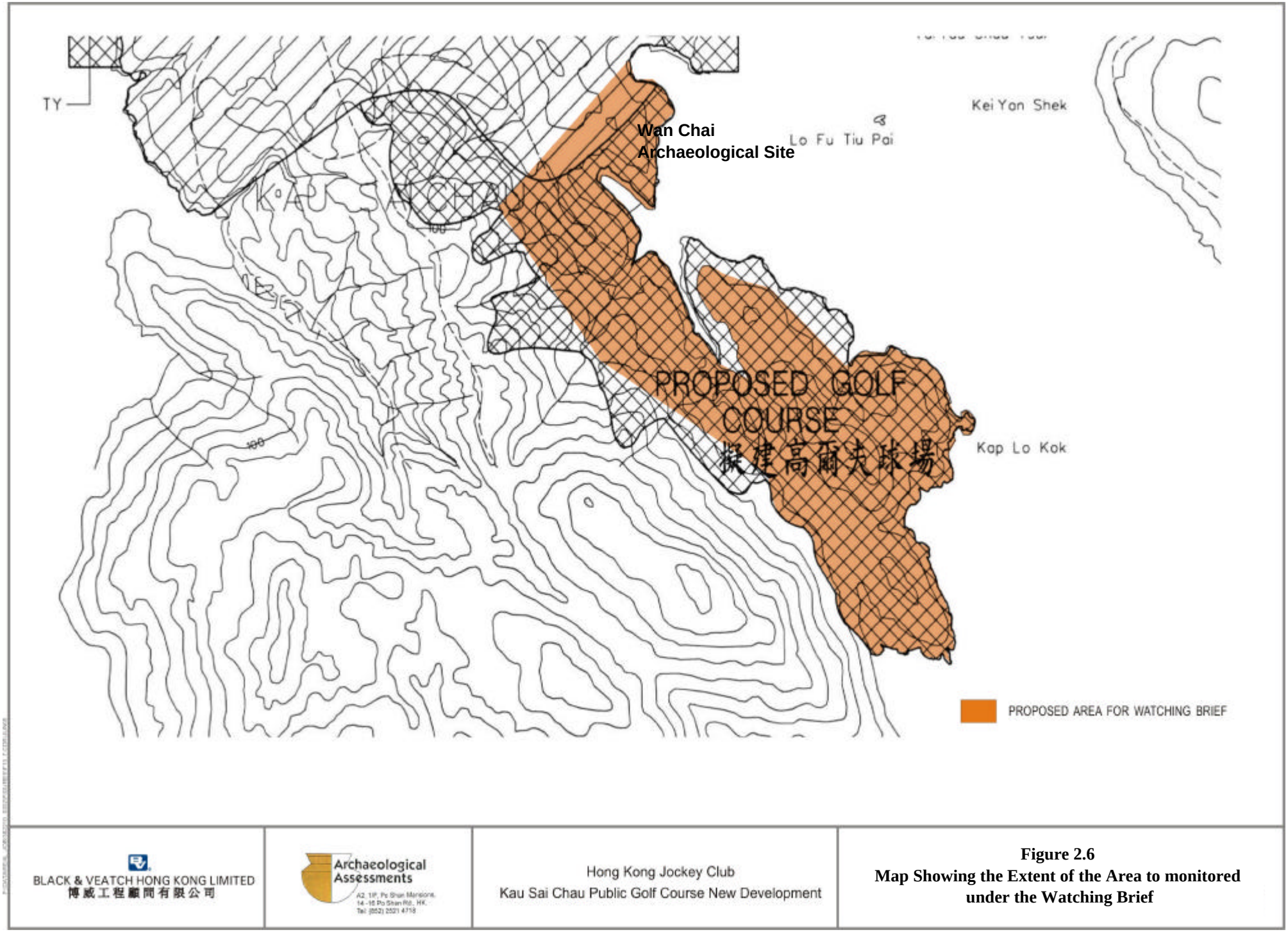
Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung

Location of proposed coral transplantation site (Bedrock with corals)

Fig 2.5

Prepared	Checked
ET	JW

Date Feb-06



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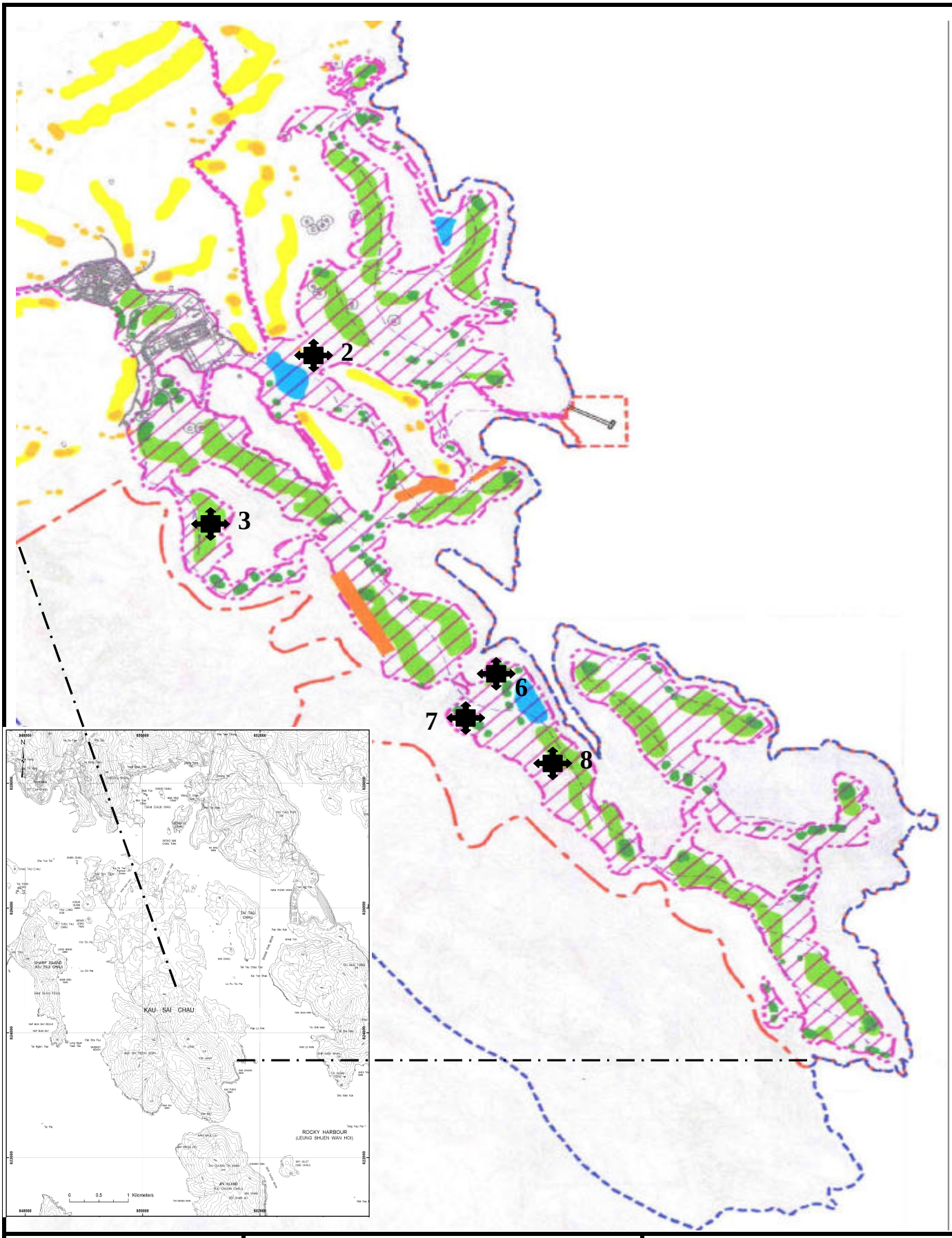
Archaeological Assessments

Hong Kong Jockey Club
Kau Sai Chau Public Golf Course New Development

Figure 2.6
Map Showing the Extent of the Area to monitored under the Watching Brief



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Proposed Extension of Public Golf Course at Kau Sai Chau Island, Sai Kung

Sampling location for land contamination

Fig 2.7

Prepared	Checked
ET	JW

Date
Feb-06