AECOM

China Harbour Engineering Company Limited

Contract No. HY/2010/02

Hong Kong – Zhuhai – Macao Bridge Hong Kong Boundary Crossing Facilities – Reclamation Works

Quarterly EM&A Report for March 2013- May 2013

[09/2013]

	Name	Signature
Prepared & Checked:	Y T Tang	
Reviewed, Approved and Certified:	Echo Leong (ETL)	

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Disclaimer

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ENVIRON

Ref.: HYDHZMBEEM00_0_1233L.13 30 Sept 2013

Engineer's Representative
Ove Arup & Partners
Chief Resident Engineer's Office
5 Ying Hei Road, Tung Chung, Lantau
Hong Kong

By Fax (3698 5999) and By Post

Attention: Mr. Michael Lo

Dear Mr. Lo,

Re: Agreement No. CE 48/2011 (EP)
Environmental Project Office for the
HZMB Hong Kong Link Road, HZMB Hong Kong Boundary Crossing Facilities, and Tuen Mun-Chek Lap Kok Link – Investigation

Contract No. HY/2010/02
Hong Kong – Zhuhai – Macao Bridge
Hong Kong Boundary Crossing Facilities – Reclamation Work
Quarterly Environmental Monitoring & Audit Report for March 2013 to May 2013

Reference is made to the Environmental Team's submission of the Quarterly Environmental Monitoring & Audit Report for March 2013 to May 2013 (letter ref. 60249820/C/RMKY13093001 dated 30 September 2013) copied to us by E-mail on 30 September 2013.

Please be informed that we have no adverse comment on the captioned report. The ET Leader and the relevant specialist(s) of the ET are reminded that our verification to your report does not release any of their obligation in the EM&A Manual under the applicable Environmental Permit(s) for this project, in particular on dolphin monitoring and checking on any change in density and distribution pattern of Chinese White Dolphin and recommending appropriate actions and mitigation measures.

Thank you very much for your kind attention and please do not hesitate to contact the undersigned should you have any queries.

Yours sincerely,

Raymond Dai
Independent Environmental Checker

c.c.	HyD	Mr. Matthew Fung	(By Fax: 3188 6614)
	HyD	Mr. Wai-ping Lee	(By Fax: 3188 6614)
	AECOM	Ms. Echo Leong	(By Fax: 2317 7609)
	CHEC	Mr. C M Wong	(By Fax: 2578 0413)

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ENVIRON Hong Kong Limited 英環香港有限公司
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EXECUTIVE SUMMARY

Contract No. HY/2010/02 – Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Reclamation Work (here below, known as "the Project") mainly comprises reclamation at the northeast of the Hong Kong International Airport of an area of about 130-hectare for the construction of an artificial island for the development of the Hong Kong Boundary Crossing Facilities (HKBCF), and about 19-hectare for the southern landfall of the Tuen Mun - Chek Lap Kok Link (TMCLKL). It is a designated project and is governed by the current permits for the Project, i.e. the amended Environmental Permits (EPs) issued on 24 April 2013 (EP-353/2009/F) and 8 December 2011 (EP-354/2009/A) (for TMCLKL Southern Landfall Reclamation only).

Ove Arup & Partners Hong Kong Limited (Arup) was appointed by Highways Department (HyD) as the consultants for the design and construction assignment for the Project's reclamation works (i.e. the Engineer for the Project).

China Harbour Engineering Company Limited (CHEC) was awarded by HyD as the Contractor to undertake the construction work of the Project.

ENVIRON Hong Kong Ltd. was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO) for the Project.

AECOM Asia Co. Ltd. (AECOM) was appointed by CHEC to undertake the role of Environmental Team for the Project for carrying out the environmental monitoring and audit (EM&A) works.

The construction phase of the Project under the EPs was commenced on 12 March 2012 and will be tentatively completed by early Year 2016. The EM&A programme, including air quality, noise, water quality and dolphin monitoring and environmental site inspections, was commenced on 12 March 2012.

This report documents the findings of EM&A works conducted in the period between 1 March 2013 and 31 May 2013. As informed by the Contractor, major activities in the reporting quarter were:-

Marine-based Works
- Cellular structure installation
- Connecting arc cell installation
- Laying geo-textile
- Sand blanket laying
- Maintenance of silt curtain
- Stone column installation
- Laying stone blanket
- Band drain installation
- Backfill cellular structure
- Instrumentation works
- Construction of temporary seawall
- Ground investigation
- Installation of silt screen at sea water intake of HKIA

Land-based Works
- Maintenance works of Site Office at Works Area WA2
- Maintenance works of Public Works Regional Laboratory at Works Area WA3
- Geo-textile fabrication at Works Area WA2
- Silt curtain fabrication at Works Area WA4
- Erection of site office for CHEC(GD) at Works Area WA2
- Green roof construction at Works Area WA2
- Construction of Temporary Marine Access at Works Area WA2

A summary of monitoring and audit activities conducted in the reporting quarter is listed below:

24-hour Total Suspended Particulates (TSP) monitoring	16 sessions
1-hour TSP monitoring	16 sessions
Noise monitoring	12 sessions

Impact water quality monitoring	39 sessions
Impact dolphin monitoring	6 surveys
Joint Environmental site inspection	13 sessions

Breaches of Action and Limit Levels for Air Quality

One (1) 24-hour TSP results exceeded the Action Level at monitoring station AMS7, three (3) 24-hour TSP results exceeded the Action Level at monitoring station AMS3A and two (2) 24-hour TSP result exceeded the Limit Level at monitoring station AMS3A. The investigation results showed that the action and limit level exceedances were non-project related. All 1-hour TSP results were below the Action and Limit Level at all monitoring locations in the reporting quarter.

Breaches of Action and Limit Levels for Noise

Due to one documented complaint is received; one (1) Action Level Exceedance of construction noise was recorded in the reporting quarter. The investigation results show that the action level exceedance was non-project related. No Limit Level Exceedance of construction noise was recorded in the reporting quarter.

Breaches of Action and Limit Levels for Water Quality

Ten (10) Action Level exceedances were recorded at measured suspended solids (SS) values (in mg/L) in the reporting quarter, one (1) Limit Level exceedance was recorded at measured suspended solids (SS) values (in mg/L) in the reporting quarter and 1 Action Level exceedance was recorded at turbidity (NTU) in the reporting quarter. Investigation result show that the exceedances were not due to the Project works.

Breaches of Action and Limit Levels for Impact Dolphin Monitoring

One (1) Limit level exceedance was recorded in the reporting quarter. The investigation results showed that there is no evidence that exceedances are related to Project works are annexed in Appendix L.

Triggering of Event and Action Plan for Impact Dolphin Monitoring

No Triggering of Event and Action Plan for Impact Dolphin Monitoring.

Implementation Status and Review of Environmental Mitigation Measures

Most of the recommended mitigation measures, as included in the EM&A programme, were implemented properly in the reporting quarter. Reference is made to ET's proposal of the omission of air monitoring station (AMS 6) dated on 1 November 2012 and EPD's letter dated on 19 November 2012 regarding the conditional approval of the proposed omission of air monitoring station (AMS 6) for Contract No. HY/2010/02. The aforesaid omission of Monitoring Station AMS6 was effective since 19 November 2012.

The recommended environmental mitigation measures effectively minimize the potential environmental impacts from the Project. The EM&A programme effectively monitored the environmental impacts from the construction activities and ensure the proper implementation of mitigation measures. No particular recommendation was advised for the improvement of the programme.

Moreover, regular review and checking on the construction methodologies, working processes and plants were carried out to ensure the environmental impacts were kept minimal and recommended environmental mitigation measures were implemented effectively.

Complaint, Notification of Summons and Successful Prosecution

Four (4) environmental complaints and one (1) summons was received were received in the reporting quarter.

No successful prosecution was received were received in the reporting quarter.

1 INTRODUCTION

1.1 Background

1.1.1 Contract No. HY/2010/02 – Hong Kong-Zhuhai-Macao Bridge Hong Kog Boundary Crossing Facilities – Reclamation Work (here below, known as "the Project") mainly comprises seawall construction and reclamation at the northeast of the Hong Kong International Airport of an area of about 130-hectare for the construction of an artificial island for the development of the Hong Kong Boundary Crossing Facilities (HKBCF), and about 19-hectare for the southern landfall of the Tuen Mun - Chek Lap Kok Link (TMCLKL).

1.1.2 The environmental impact assessment (EIA) reports (Hong Kong – Zhuhai – Macao Bridge Hong Kong Boundary Crossing Facilities – EIA Report (Register No. AEIAR-145/2009) (HKBCFEIA) and Tuen Mun – Chek Lap Kok Link – EIA Report (Register No. AEIAR-146/2009) (TMCLKLEIA), and their environmental monitoring and audit (EM&A) Manuals (original EM&A Manuals), for the Project were approved by Environmental Protection Department (EPD) in October 2009.

1.1.3 EPD subsequently issued the Environmental Permit (EP) for HKBCF in November 2009 (EP-353/2009) and the Variation of Environmental Permit (VEP) in June 2010 (EP-353/2009/A), November 2010 (EP-353/2009/B), November 2011 (EP-353/2009/C), March 2012 (EP-353/2009/D), October 2012 (EP-353/2009/E) and April 2013 (EP-353/2009/F). Similarly, EPD issued the Environmental Permit (EP) for TMCLKL in November 2009 (EP-354/2009) and the Variation of Environmental Permit (VEP) in December 2010 (EP-354/2009/A).

1.1.4 The Project is a designated project and is governed by the current permits for the Project, i.e. the amended EPs issued on 24 April 2013 (EP-353/2009/F) and 8 December 2011 (EP-354/2009/A) (for TMCLKL Southern Landfall Reclamation only).

1.1.5 A Project Specific EM&A Manual, which included all project-relation contents from the original EM&A Manuals for the Project, was issued in May 2012.

1.1.6 Ove Arup & Partners Hong Kong Limited (Arup) was appointed by Highways Department (HyD) as the consultants for the design and construction assignment for the Project's reclamation works (i.e. the Engineer for the Project).

1.1.7 China Harbour Engineering Company Limited (CHEC) was awarded by HyD as the Contractor to undertake the construction work of the Project.

1.1.8 ENVIRON Hong Kong Ltd. was employed by HyD as the Independent Environmental Checker (IEC) and Environmental Project Office (ENPO) for the Project.

1.1.9 AECOM Asia Co. Ltd. (AECOM) was appointed by CHEC to undertake the role of Environmental Team for the Project for carrying out the EM&A works.

1.1.10 The construction phase of the Project under the EPs was commenced on 12 March 2012 and will be tentatively completed by early Year 2016.

1.1.11 According to the Project Specific EM&A Manual, there is a need of an EM&A programme including air quality, noise, water quality and dolphin monitoring and environmental site inspections. The EM&A programme of the Project commenced on 12 March 2012.

1.2 Scope of Report

1.2.1 This is the fifth quarterly EM&A Report under the Contract No. HY/2010/02 Hong Kong-Zhuhai-Macao Bridge Hong Kong Boundary Crossing Facilities – Reclamation Works. This report presents a summary of the environmental monitoring and audit works, list of activities and mitigation measures proposed by the ET for the Project from 1 March 2013 and 31 May 2013.

1.3 Project Organization

1.3.1 The project organization structure is shown in Appendix A. The key personnel contact names and numbers are summarized in Table 1.1.

Table 1.1 Contact Information of Key Personnel

Party	Position	Name	Telephone	Fax
Engineer's Representative (ER) (Ove Arup & Partners Hong Kong Limited)	Chief Resident Engineer	Roger Marechal	2528 3031	2668 3970
IEC / ENPO (ENVIRON Hong Kong Limited)	Independent Environmental Checker	Raymond Dai	3743 0788	3548 6988
	Environmental Project Office Leader	Y.H. Hui	3743 0788	3548 6988
Contractor (China Harbour Engineering Company Limited)	General Manager (S&E)	Daniel Leung	3157 1086	2578 0413
	Environmental Officer	C. M. Wong	3157 1086	2578 0413
	24-hour Hotline	Alan C.C. Yeung	9448 0325	--
ET (AECOM Asia Company Limited)	ET Leader	Echo Leong	3922 9280	2317 7609

1.4 Summary of Construction Works

1.4.1 The construction phase of the Project under the EP commenced on 12 March 2012.

1.4.2 As informed by the Contractor, details of the major works carried out in the reporting quarter are listed below:-

Marine-based Works
- Cellular structure installation
- Connecting arc cell installation
- Laying geo-textile
- Sand blanket laying
- Maintenance of silt curtain
- Stone column installation
- Laying stone blanket
- Band drain installation
- Backfill cellular structure
- Instrumentation works
- Construction of temporary seawall
- Ground investigation
- Installation of silt screen at sea water intake of HKIA

Land-based Works

- Maintenance works of Site Office at Works Area WA2
- Maintenance works of Public Works Regional Laboratory at Works Area WA3
- Geo-textile fabrication at Works Area WA2
- Silt curtain fabrication at Works Area WA4
- Erection of site office for CHEC(GD) at Works Area WA2
- Green roof construction at Works Area WA2
- Construction of Temporary Marine Access at Works Area WA2

1.4.3 The 3-month rolling construction programme of the Project is shown in Appendix B.

1.4.4 The general layout plan of the Project site showing the detailed works areas is shown in Figure 1.

1.4.5 The environmental mitigation measures implementation schedule are presented in Appendix C.

2 SUMMARY OF EM&A PROGRAMME REQUIREMENTS

2.1 Monitoring Parameters

2.1.1 The Project Specific EM&A Manual designated 4 air quality monitoring stations, 2 noise monitoring stations, 21 water monitoring stations (9 Impact Stations, 7 Sensitive Receiver Stations and 5 Control/Far Field Stations) to monitor environmental impacts on air quality, noise and water quality respectively. Pre-set and fixed transect line vessel based dolphin survey was required in two AFCD designated areas (Northeast and Northwest Lantau survey areas). The impact dolphin monitoring at each survey area should be conducted twice per month.

2.1.2 For impact air quality monitoring, monitoring locations AMS2 (Tung Chung Development Pier) and AMS7 (Hong Kong SkyCity Marriott Hotel) were set up at the proposed locations in accordance with Project Specific EM&A Manual. The conditional omission of Monitoring Station AMS6 was effective since 19 November 2012. For monitoring location AMS3 (Ho Yu College), as proposed in the Project Specific EM&A Manual, approval for carrying out impact monitoring could not be obtained from the principal of the school. Permission on setting up and carrying out impact monitoring works at nearby sensitive receivers, like Caribbean Coast and Coastal Skyline, was also sought. However, approvals for carrying out impact monitoring works within their premises were not obtained. Impact air quality monitoring was conducted at site boundary of the site office area in Works Area WA2 (AMS3A) respectively. Same baseline and Action Level for air quality, as derived from the baseline monitoring data recorded at Ho Yu College, was adopted for this alternative air quality location.

2.1.3 For impact noise monitoring, monitoring locations NMS2 (Seaview Crescent Tower 1) was set up at the proposed locations in accordance with Project Specific EM&A Manual. However, for monitoring location NMS3 (Ho Yu College), as proposed in the Project Specific EM&A Manual, approval for carrying out impact monitoring could not be obtained from the principal of the school. Permission on setting up and carrying out impact monitoring works at nearby sensitive receivers, like Caribbean Coast and Coastal Skyline, was also sought. However, approvals for carrying out impact monitoring works within their premises were not obtained. Impact noise monitoring was conducted at site boundary of the site office area in Works Area WA2 (NMS3A) respectively. Same baseline noise level, as derived from the baseline monitoring data recorded at Ho Yu College was adopted for this alternative noise monitoring location.

2.1.4 In accordance with the Project Specific EM&A Manual, twenty-one stations were designated for impact water quality monitoring. The nine Impact Stations (IS) were chosen on the basis of their proximity to the reclamation and thus the greatest potential for water quality impacts, the seven Sensitive Receiver Stations (SR) were chosen as they are close to the key sensitive receives and the five Control/ Far Field Stations (CS) were chosen to facilitate comparison of the water quality of the IS stations with less influence by the Project/ ambient water quality conditions.

2.1.5 Due to safety concern and topographical condition of the original locations of SR4 and SR10B, alternative impact water quality monitoring stations, naming as SR4(N) and SR10B(N), were adopted, which are situated in vicinity of the original impact water quality monitoring stations (SR4 and SR10B) and could be reachable. Same baseline and Action Level for water quality, as derived from the baseline monitoring data recorded, were adopted for these alternative impact water quality monitoring stations.

2.1.6 The monitoring locations used during the reporting quarter are depicted in Figures 2, 3 and 4 respectively.

2.1.7 The Project Specific EM&A Manual also required environmental site inspections for air quality, noise, water quality, chemical, waste management, marine ecology and landscape and visual impact.

2.2 Environmental Quality Performance (Action/Limit Levels)

2.2.1 The environmental quality performance limits (i.e. Action and/or Limit Levels) of air and water quality monitoring were derived from the baseline air and water quality monitoring results at the respective

monitoring stations, while the environmental quality performance limits of noise monitoring were defined in the EM&A Manual.

2.2.2 The environmental quality performance limits of air quality, noise and water monitoring are given in Appendix D.

2.3 Environmental Mitigation Measures

2.3.1 Relevant environmental mitigation measures were stipulated in the Particular Specification and EPs (EP-353/2009/F and EP-354/2009/A) (for TMCLKL Southern Landfall Reclamation only) for the Contractor to adopt. A list of environmental mitigation measures and their implementation statuses are given in Appendix C.

3 MONITORING RESULTS

3.1 Air Quality Monitoring

3.1.1 In accordance with the Project Specific EM&A Manual, impact 1-hour Total Suspended Particulates (TSP) monitoring was conducted for at least three times every 6 days, while impact 24-hour TSP monitoring was carried out for at least once every 6 days at the 4 monitoring stations (AMS2, AMS3A, AMS6 and AMS7).

3.1.2 The monitoring locations for impact air quality monitoring are depicted in Figure 2. However, for AMS6 (Dragonair/CNAC (Group) Building), permission on setting up and carrying out impact monitoring works was sought, however, access to the premise has not been granted yet on this report issuing date.

3.1.3 The weather was mostly sunny, with occasional cloudy and occasional rainy in the reporting quarter. The major dust source in the reporting quarter included construction activities from the Project, as well as nearby traffic emissions.

3.1.4 The number of monitoring events and exceedances recorded in each month of the reporting quarter are presented in Table 3.1 and Table 3.2 respectively.

Table 3.1 Summary of Number of Monitoring Events for 1-hr & 24-hr TSP Concentration

Monitoring Parameter	Location	No. of monitoring events		
		March 13	April 13	May 13
1-hr TSP	AMS2	15	18	15
	AMS3A	15	18	15
	AMS7	15	18	15
24-hr TSP	AMS2	5	6	5
	AMS3A	5	6	5
	AMS7	5	6	5

Table 3.2 Summary of Number of Exceedances for 1-hr & 24-hr TSP Monitoring

Monitoring Parameter	Location	Level of Exceedance	Level of Exceedance		
			March 13	April 13	May 13
1-hr TSP	AMS2	Action	0	0	0
		Limit	0	0	0
	AMS3A	Action	0	0	0
		Limit	0	0	0
	AMS7	Action	0	0	0
		Limit	0	0	0
		Total	***0***	***0***	***0***
24-hr TSP	AMS2	Action	0	0	0
		Limit	0	0	0
	AMS3A	Action	2	1	0
		Limit	1	1	0
	AMS7	Action	0	1	0
		Limit	0	0	0
		Total	***3***	***3***	***0***

3.1.5 All impact 1-hour TSP monitoring results at all monitoring locations were below the Action and Limit Levels in the reporting quarter.

3.1.6 One (1) 24-hour TSP results exceeded the Action Level at monitoring station AMS7, three (3) 24-hour TSP results exceeded the Action Level at monitoring station AMS3A and two (2) 24-hour TSP result exceeded the Limit Level at monitoring station AMS3A. The investigation results showed that the action and limit level exceedances were non-project related. All 1-hour TSP results were below the

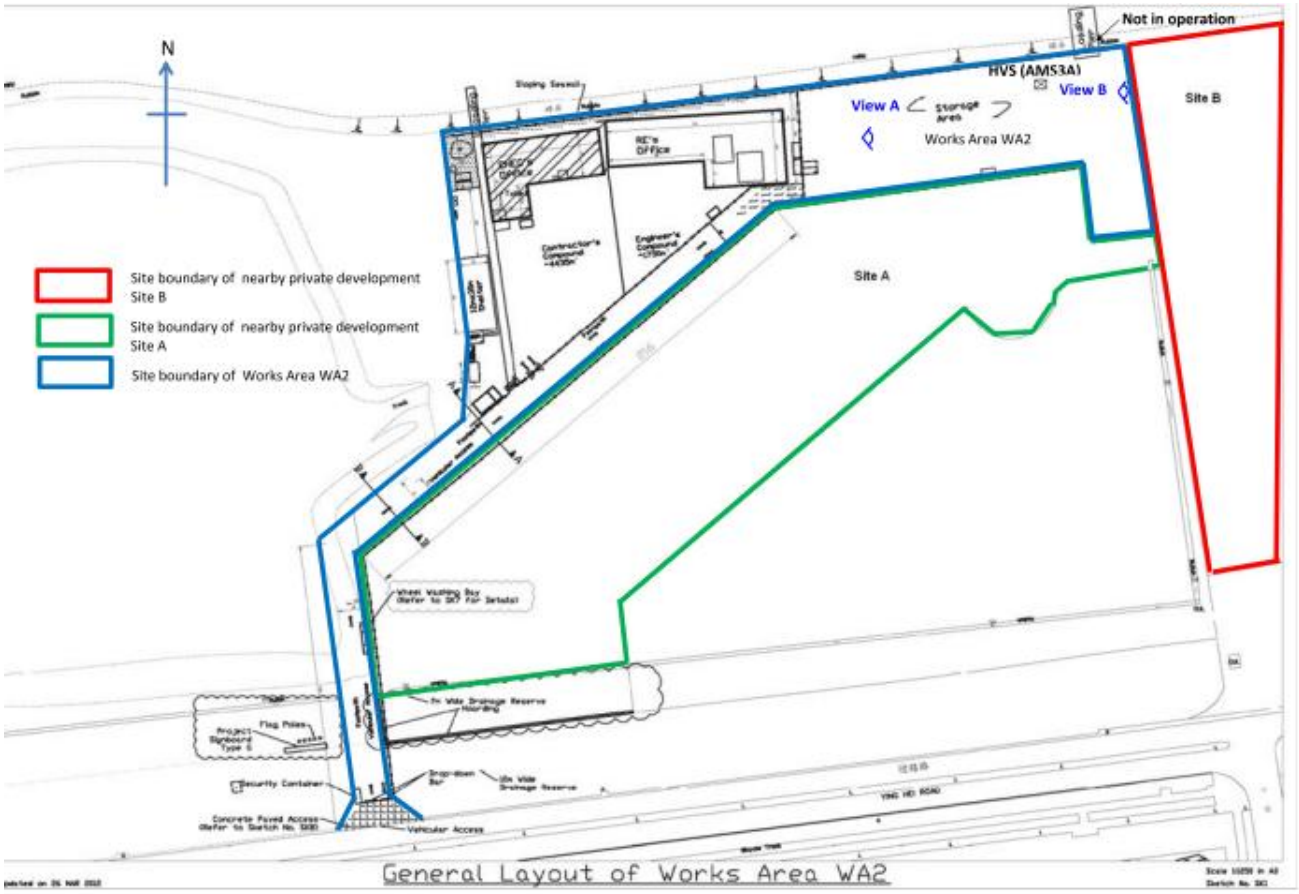
Action and Limit Level at all monitoring locations in the reporting month. Investigation results show that both the Action and Limit Level exceedance of 24-hour TSP results were not project-related.

3.1.7 For the one (1) 24-hour TSP result exceeded the Limit Level on 04 March 13 at monitoring station AMS3A, according to information provided by the Contractor, land-based construction activity such as transloading and delivery of geotextile and installing sand bags were undertaken at Works Area WA2 during the monitoring period which is unlikely to cause fugitive dust emission.

3.1.7.1 Functional checking on HVS at AMS3A was done. Air flow of the HVS was checked and the flow was steady during the 24-hr TSP sampling at AMS3A. The filter paper was re-weighted by the assigned HOKLAS laboratory and the result was reconfirmed.

3.1.7.2 Construction activities, like sheet piling and percussive piling, were carrying out by nearby private development project during the course of monitoring, which are close to the monitoring station AMS3A but beyond the site boundary of Works Area WA2. Trucks were observed passing exposed soil surfaces at those construction sites of nearby private development project.

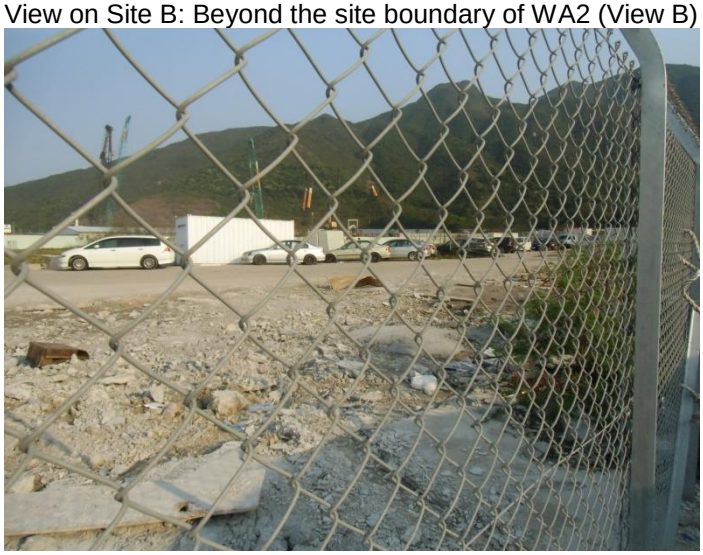
3.1.7.3 Please see layout map attached for reference of site conditions



3.1.7.4 Please see photos attached for reference of site conditions:

View of Works Area WA2 : Hard paved ground next to monitoring station AMS3A (View A)

View on Site B: Beyond the site boundary of WA2 (View B)



3.1.7.5 As refer to the wind data collected at wind station at Works Area WA2 during the monitoring period on 4 and 5 March 13 (please see attached) south-southeast wind was prevailing during the monitoring period. Construction works carried out at construction sites of nearby private development project may contribute to the measured dust levels at the monitoring station AMS3A.

3.1.7.6 The 1-hr TSP values recorded at AMS3A on 4 March 2013, which are within the monitoring period of the 24-hr TSP, were 85 g/m^3, 83 g/m^3 and 84 g/m^3 respectively. All measured values are well below the Action and Limit Levels.

3.1.7.7 The measured 24-hr TSP values recorded at AMS2 and AMS7 (which are closer to the marine-based works areas) on the same monitoring date were 99 g/m^3 and 124 g/m^3 respectively, which are below the Action and Limit Levels.

3.1.7.8 The following dust mitigation measures have been implemented at Works Area WA2:

- Works Area WA2's surface was hard-paved, compacted or hydro-seeded
- Vehicle washing facility was provided at vehicle exit points,
- Measures for preventing fugitive dust emission are provided, e.g. tarpaulin covers.

3.1.7.9 The dust exceedance was therefore considered not to be due to the Project works.

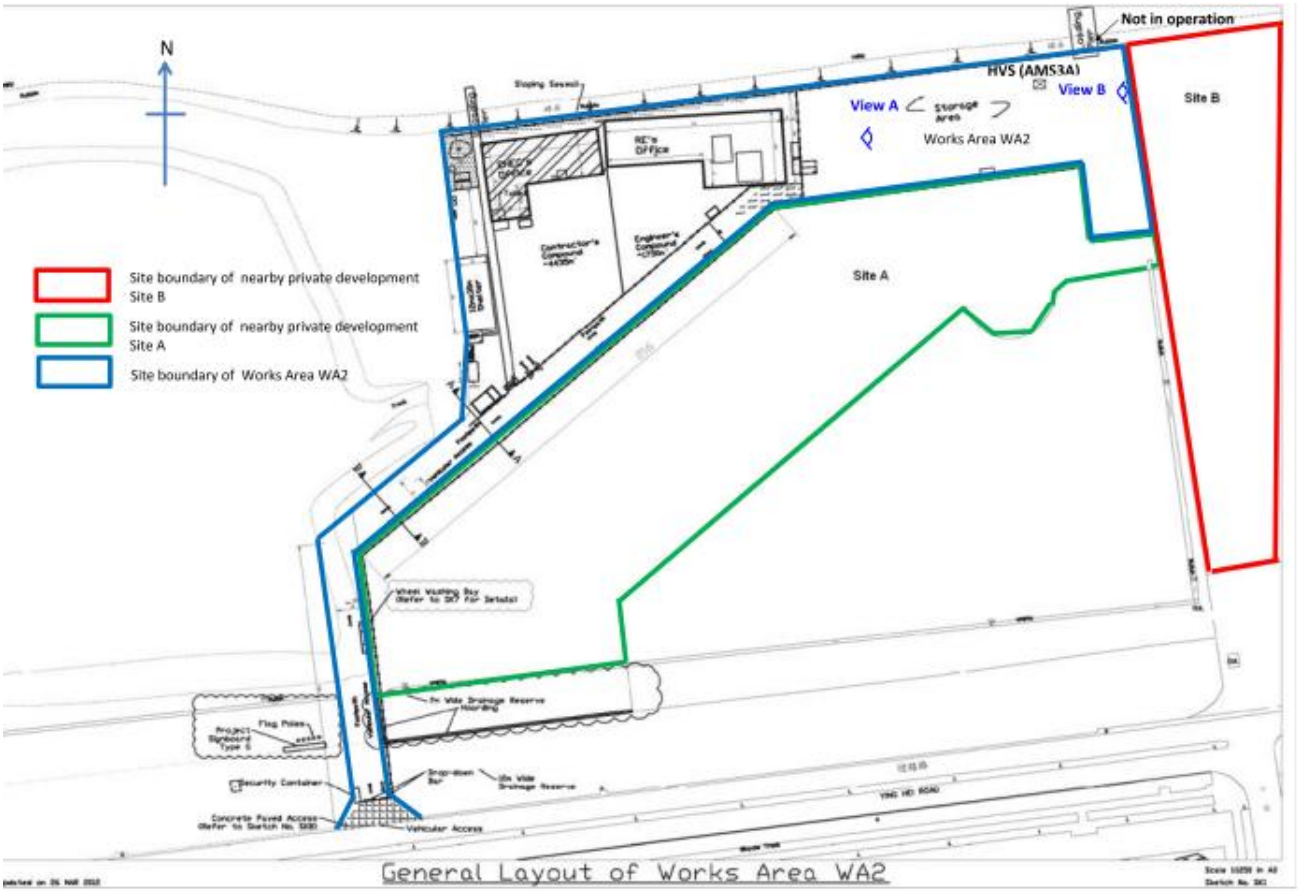
3.1.7.10 The Contractor was recommended to continue implementing existing dust mitigation measures.

3.1.8 For the one (1) 24-hour TSP result exceeded the action Level on 09 March 13 at monitoring station AMS3A, according to information provided by the Contractor, land-based construction activity such as transloading and delivery of geotextile and installing sand bags to vessels was being undertaken at Works Area WA2 during the monitoring period.

3.1.8.1 Functional checking on HVS at AMS3A was done. Air flow of the HVS was checked and the flow was steady during the 24-hr TSP sampling at AMS3A. The filter paper was re-weighted by the assigned HOKLAS laboratory and the result was reconfirmed.

3.1.8.2 As informed by the Contractor, construction activities like sheet piling and percussive piling, were carrying out by nearby private development project during the course of monitoring, which are close to the monitoring station AMS3A but beyond the site boundary of Works Area WA2. Traffics were observed passing exposed soil surfaces at those construction sites of nearby private development project.

3.1.8.3 Please see layout map attached for reference of site conditions



3.1.8.4 Please see photos attached for reference of site conditions:

View of Works Area WA2 : the hard paved ground next to monitoring station AMS3A (View A)

View on Site B: Beyond the site boundary of WA2 (View B)

3.1.8.5 As refer to the wind data collected at wind station at Works Area WA2 during the monitoring period on 8 and 9 March 13 (as attached) south wind was prevailing during the monitoring period. Construction works carried out at construction sites of nearby private development project may contribute to the measured dust levels at the monitoring station AMS3A.

3.1.8.6 The 1-hr TSP values recorded at AMS3A on 09 March 2013, which are within the monitoring period of the 24-hr TSP, were 96 g/m^3, 97 g/m^3 and 98 g/m^3 respectively. All measured values are well below the Action and Limit Levels.

3.1.8.7 The measured 24-hr TSP values recorded at AMS2 and AMS7 (which are closer to the marine-based works areas) on the same monitoring date were 89 g/m^3 and 124 g/m^3 respectively, which are below the Action and Limit Levels.

3.1.8.8 The following dust mitigation measures have been implemented at Works Area WA2:

- Works Area WA2's surface was hard-paved, compacted or hydro-seeded
- Vehicle washing facility was provided at vehicle exit points,
- Measures for preventing fugitive dust emission are provided, e.g. tarpaulin covers.

3.1.8.9 The dust exceedance was therefore considered not to be due to the Project works.

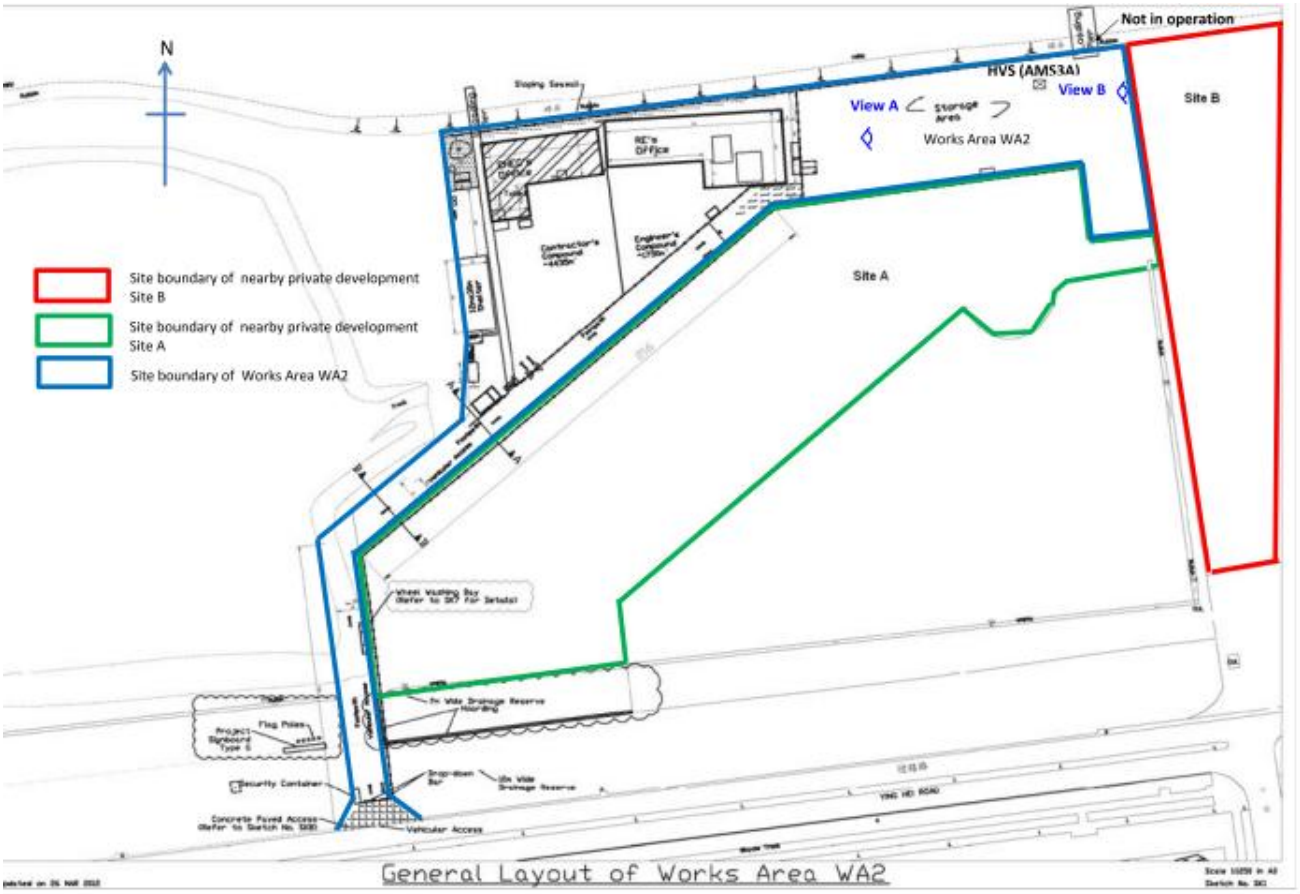
3.1.8.10 The Contractor was recommended to continue implementing existing dust mitigation measures.

3.1.9 For the one (1) 24-hour TSP result exceeded the Limit Level on 15 March 13 at monitoring station AMS3A, according to information provided by the Contractor, land-based construction activity such as using canvas to cover sand material and stitching geotextile were being undertaken at Works Area WA2 during the monitoring period.

3.1.9.1 Functional checking on HVS at AMS3A was done. Air flow of the HVS was checked and the flow was steady during the 24-hr TSP sampling at AMS3A. The filter paper was re-weighted by the assigned HOKLAS laboratory and the result was reconfirmed.

3.1.9.2 As informed by the Contractor, construction activities like sheet piling and percussive piling, were carrying out by nearby private development project during the course of monitoring, which are close to the monitoring station AMS3A but beyond the site boundary of Works Area WA2. Traffics were observed passing exposed soil surfaces at those construction sites of nearby private development project.

3.1.9.3 Please see layout map attached for reference of site conditions:



3.1.9.4 Please see photos attached for reference of site conditions:

View of Works Area WA2 : the hard paved ground next to monitoring station AMS3A (View A)

View on Site B: Beyond the site boundary of WA2 (View B)

3.1.9.5 As refer to the wind data collected at wind station at Works Area WA2 during the monitoring period on 14 and 15 March 13 (as attached) southeast winds was prevailing during the monitoring period. Construction works carried out at construction sites of nearby private development project may contribute to the measured dust levels at the monitoring station AMS3A.

3.1.9.6 The 1-hr TSP values recorded at AMS3A on 15 March 2013, which are within the monitoring period of the 24-hr TSP, were 85 g/m^3, 85 g/m^3 and 83 g/m^3 respectively. All measured values are well below the Action and Limit Levels.

3.1.9.7 The measured 24-hr TSP values recorded at AMS2 and AMS7 (which are closer to the marine-based works areas) on the same monitoring date were 99 g/m^3 and 127 g/m^3 respectively, which are below the Action and Limit Levels.

3.1.9.8 The following dust mitigation measures have been implemented at Works Area WA2:

- Works Area WA2's surface was hard-paved, compacted or hydro-seeded
- Vehicle washing facility was provided at vehicle exit points,
- Measures for preventing fugitive dust emission are provided, e.g. tarpaulin covers.

3.1.9.9 The dust exceedance was therefore considered not to be due to the Project works.

3.1.9.10 The Contractor was recommended to continue implementing existing dust mitigation measures.

3.1.10 For the one (1) 24-hour TSP result exceeded the Limit Level on 8 April 13 at monitoring station AMS3A, according to information provided by the Contractor, land-based construction activity such as using canvas to cover sand material and stitching geotextile were being undertaken at Works Area WA2 during the monitoring period.

3.1.10.1 Functional checking on HVS at AMS3A was done. Air flow of the HVS was checked and the flow was steady during the 24-hr TSP sampling at AMS3A. The filter paper was re-weighted by the assigned HOKLAS laboratory and the result was reconfirmed.

3.1.10.2 As informed by the Contractor, construction activities like sheet piling and percussive piling, were carrying out by nearby private development project during the course of monitoring, which are close to the monitoring station AMS3A but beyond the site boundary of Works Area WA2. Traffics were observed passing exposed soil surfaces at those construction sites of nearby private development project. Please also see photo and layout map attached for reference of site conditions.

3.1.10.3 As refer to the wind data collected at wind station at Works Area WA2 during the monitoring period on 08 and 09 April 13 (as attached) East winds was prevailing during the monitoring period. Construction works carried out at construction sites of nearby private development project may contribute to the measured dust levels at the monitoring station AMS3A.

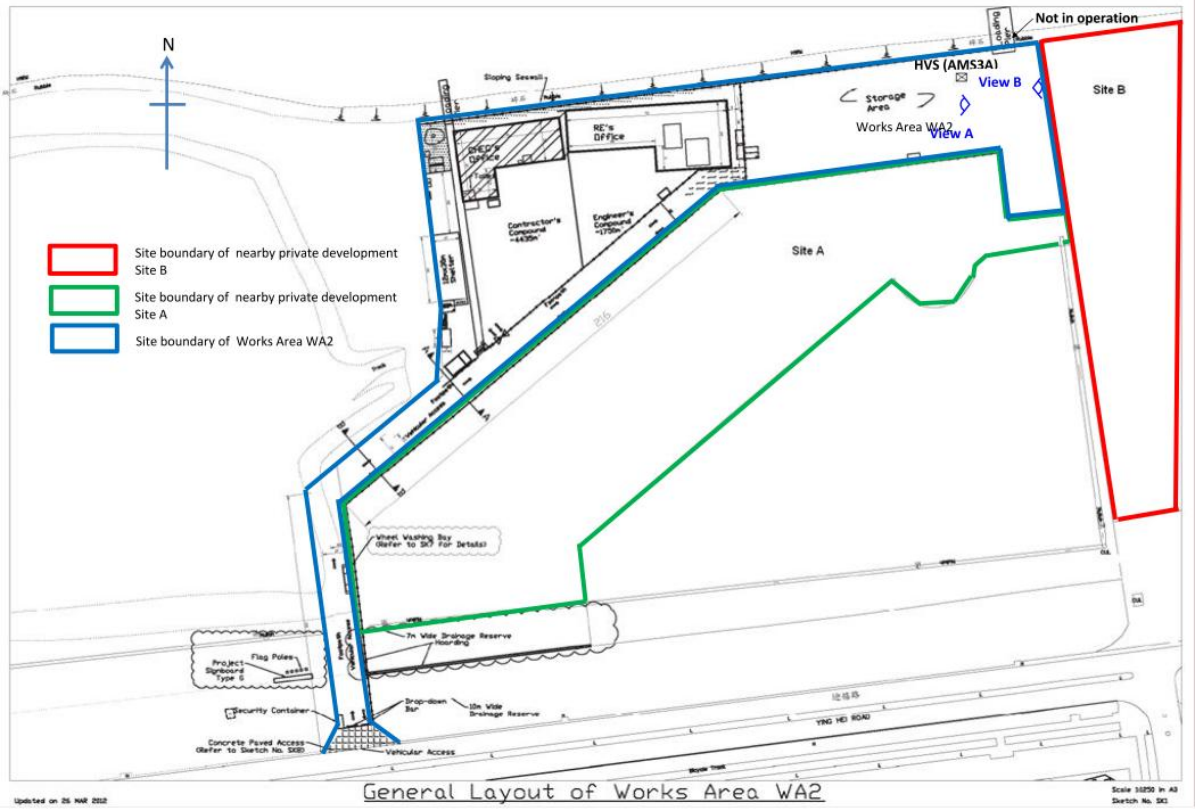
3.1.10.4 The 1-hr TSP values recorded at AMS3A on 08 April 13, which are within the monitoring period of the 24-hr TSP, were 84 g/m^3, 87 g/m3 and 81g/m^3 respectively. All measured values are well below the Action and Limit Levels.

3.1.10.5 The measured 24-hr TSP values recorded at AMS2 and AMS7 (which are closer to the marine-based works areas) on the same monitoring date were 104 g/m^3 and 127 g/m^3 respectively, which are below the Action and Limit Levels.

3.1.10.6 The following dust mitigation measures have been implemented at Works Area WA2:

- Works Area WA2's surface was hard-paved, compacted or hydro-seeded
- Vehicle washing facility was provided at vehicle exit points,
- Measures for preventing fugitive dust emission are provided, e.g. tarpaulin covers.

3.1.10.7 Please see layout map attached for reference of site conditions



General Layout of Works Area WA2

3.1.10.8 Please see photos attached for reference of site conditions:

View of Works Area WA2 : Hard paved ground next to monitoring station AMS3A (View A)

View on Site B: Beyond the site boundary of WA2 (View B)

3.1.10.9 The dust exceedance was therefore considered not to be due to the Project works.

3.1.10.10 The Contractor was recommended to continue implementing existing dust mitigation measures.

3.1.11 For the one (1) 24-hour TSP result exceeded the action Level on 13 April 13 at monitoring station AMS7, According to information provided by the Contractor, land-based construction activity such as delivering geotextile material was being undertaken at Works Area WA2 during the monitoring period. Marine-based construction activity such as stone column installation was being undertaken at portion D and portion A.

3.1.11.1 Stone column was being installed at the seabed therefore it is considered that stone column installation is unlikely to contribute to the recorded 24hr-TSP exceedance.

3.1.11.2 Functional checking on HVS at AMS7 was done. Air flow of the HVS was checked and the flow was steady during the 24-hr TSP sampling at AMS3A. The filter paper was re-weighted by the assigned HOKLAS laboratory and the result was reconfirmed.

3.1.11.3 The 1-hr TSP values recorded at AMS7 on 13 April 13, which are within the monitoring days of the 24-hr TSP, were 83 g/m^3, 81 g/m^3 and 80g/m^3 respectively. All measured values are well below the Action

and Limit Levels.

3.1.11.4 The measured 24-hr TSP values recorded at AMS2 and AMS3A on the same monitoring date were 64 g/m^3 and 53 g/m^3 respectively, which are below the Action and Limit Levels.

3.1.11.5 On the other hand, according to observation made at the monitoring station AMS7, there was no non-project potential cause/activity at the surrounding of monitoring station AMS7 which might potentially contribute to the dust action level exceedance.

3.1.11.6 As refer to the wind data collected at wind station at Works Area WA2 during the monitoring period on 13 and 14 April 13 (as attached) southwest winds was prevailing during the monitoring period. Construction works carried out by this Contract is unlikely to cause dust exceedance at AMS7 under southwest prevailing wind direction.

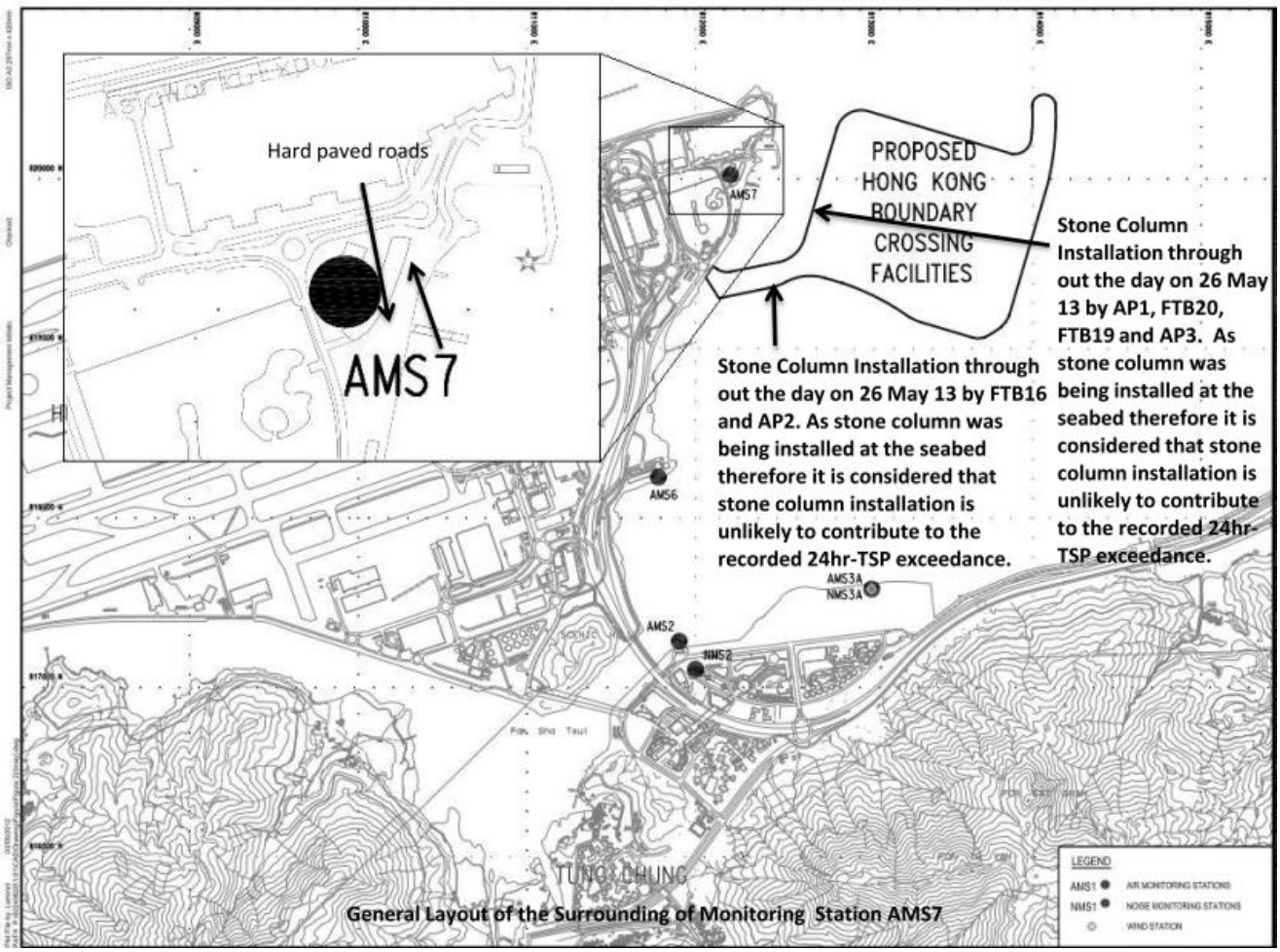
3.1.11.7 The following dust mitigation measures have been implemented at Works Area WA2:

- Works Area WA2's surface was hard-paved, compacted or hydro-seeded
- Vehicle washing facility was provided at vehicle exit points,
- Measures for preventing fugitive dust emission are provided, e.g. tarpaulin covers.

3.1.11.8 The following dust mitigation measures have been implemented at throughout the construction site:

- Excavators and generators were operated by ultra low sulphur diesel (ULSD) to minimize the possibility of air pollution.

3.1.11.9 Please see layout map attached for reference of site conditions



General Layout of the Surrounding of Monitoring Station AMS7

3.1.11.10 Please see photos of the conditions of the surrounding near the monitoring station AMS7:

3.1.11.11 The dust exceedance was therefore considered not to be due to the Project works.

3.1.11.12 The Contractor was recommended to continue implementing existing dust mitigation measures.

3.1.12 For the one (1) 24-hour TSP result exceeded the Limit Level on 29 April 13 at monitoring station AMS3A, according to information provided by the Contractor, land-based construction activity such as using installation of sandbags and stitching geotextile were being undertaken at Works Area WA2 during the monitoring period.

3.1.12.1 Functional checking on HVS at AMS3A was done. Air flow of the HVS was checked and the flow was steady during the 24-hr TSP sampling at AMS3A. The filter paper was re-weighted by the assigned HOKLAS laboratory and the result was reconfirmed.

3.1.12.2 As informed by the Contractor, construction activities like sheet piling and percussive piling, were carrying out by nearby private development project during the course of monitoring, which are close to the monitoring station AMS3A but beyond the site boundary of Works Area WA2. Traffics were observed passing exposed soil surfaces at those construction sites of nearby private development project. Please also see photo and layout map attached for reference of site conditions.

3.1.12.3 As refer to the wind data collected at wind station at Works Area WA2 during the monitoring period on 29 and 30 April 13 (as attached) South-southeast winds was prevailing during the monitoring period. Construction works carried out at construction sites of nearby private development project may contribute to the measured dust levels at the monitoring station AMS3A.

3.1.12.4 The 1-hr TSP values recorded at AMS3A on 29 April 13, which are within the monitoring period of the 24-hr TSP, were 82 g/m^3, 82 g/m^3 and 79g/m^3 respectively. All measured values are well below the

Action and Limit Levels.

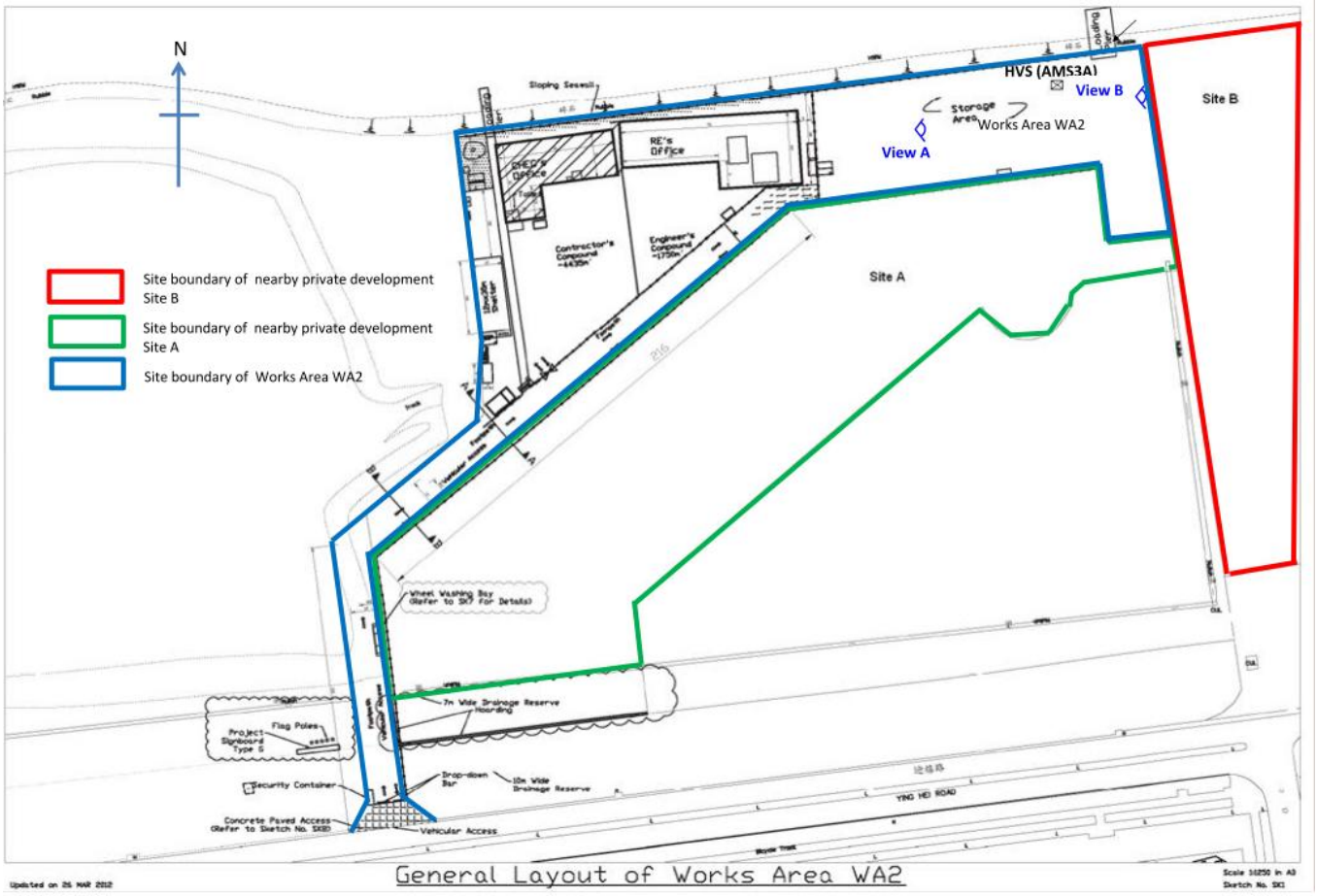
3.1.12.5 The measured 24-hr TSP values recorded at AMS2 and AMS7 (which are closer to the marine-based works areas) on the same monitoring date were 38 g/m^3 and 54 g/m^3 respectively, which are below the Action and Limit Levels.

3.1.12.6 The following dust mitigation measures have been implemented at Works Area WA2:

- Works Area WA2's surface was hard-paved, compacted or hydro-seeded
- Vehicle washing facility was provided at vehicle exit points,
- Measures for preventing fugitive dust emission are provided, e.g. tarpaulin covers.

3.1.12.7 Conditions of the construction sites near Works Area WA2:

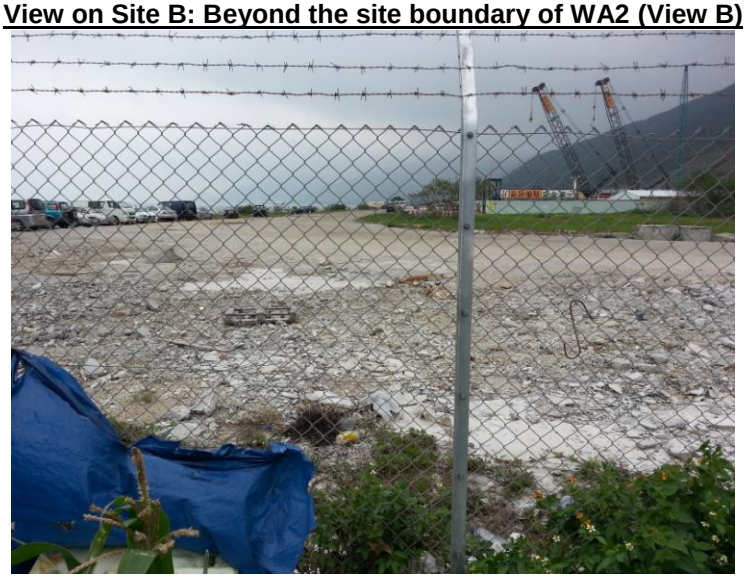
3.1.12.8 Please see layout map attached for reference of site conditions



3.1.12.9 Please see photos attached for reference of site conditions:

View of Works Area WA2 : the hard paved ground next to monitoring station AMS3A (View A)

View on Site B: Beyond the site boundary of WA2 (View B)



3.1.12.10 The dust exceedance was therefore considered not to be due to the Project works.

3.1.12.11 The Contractor was recommended to continue implementing existing dust mitigation measures.

3.2 Noise Monitoring

3.2.1 Impact noise monitoring was conducted at the 2 monitoring stations (NMS2 and NMS3A) for at least once per week during 07:00 – 19:00 in the reporting quarter.

3.2.2 The monitoring locations used during the reporting quarter are depicted in Figure 2.

3.2.3 Due to one documented complaint is received; one (1) Action Level Exceedance of construction noise was recorded in the reporting quarter. The investigation results showed that the action level exceedance was non-project related. No Limit Level Exceedance of construction noise was recorded in the reporting quarter.

3.2.4 Major noise sources during the noise monitoring included construction activities of the Project and nearby traffic noise.

3.2.5 The number of impact noise monitoring events and exceedances are summarized in Table 3.3 and Table 3.4 respectively

Table 3.3 Summary of Number of Monitoring Events for Impact Noise

Monitoring Parameter	Location	No. of monitoring events		
		March 12	April 13	May 13
	NMS2	4	4	4
	NMS3A	4	4	4

Table 3.4 Summary of Number of Monitoring Exceedances for Impact Noise

Monitoring Parameter	Location	Level of Exceedance	Level of Exceedance		
			March 12	April 13	May 13
	NMS2	Action	0	0	0
		Limit	0	0	0
	NMS3A	Action	0	0	0
		Limit	0	0	0
		Total	***0***	***0***	***0***

3.2.6 The graphical plots of the trends of the monitoring results are provided in Appendix F. No specific trend of the monitoring results or existence of persistent pollution source was noted.

3.3 Water Quality Monitoring

3.3.1 Impact water quality monitoring was conducted 3 times per week during mid-ebb and mid-flood tides at 21 water monitoring stations (9 Impact Stations, 7 Sensitive Receiver Stations and 5 Control/Far Field Stations).

3.3.2 The monitoring locations used during the reporting quarter are depicted in Figure 3.

3.3.3 Ten (10) Action Level exceedances were recorded at measured suspended solids (SS) values (in mg/L) in the reporting quarter, one (1) Limit Level exceedance was recorded at measured suspended solids (SS) values (in mg/L) in the reporting quarter and 1 Action Level exceedance was recorded at turbidity (NTU) in the reporting quarter. Investigation result show that the exceedances were not due to the Project works.

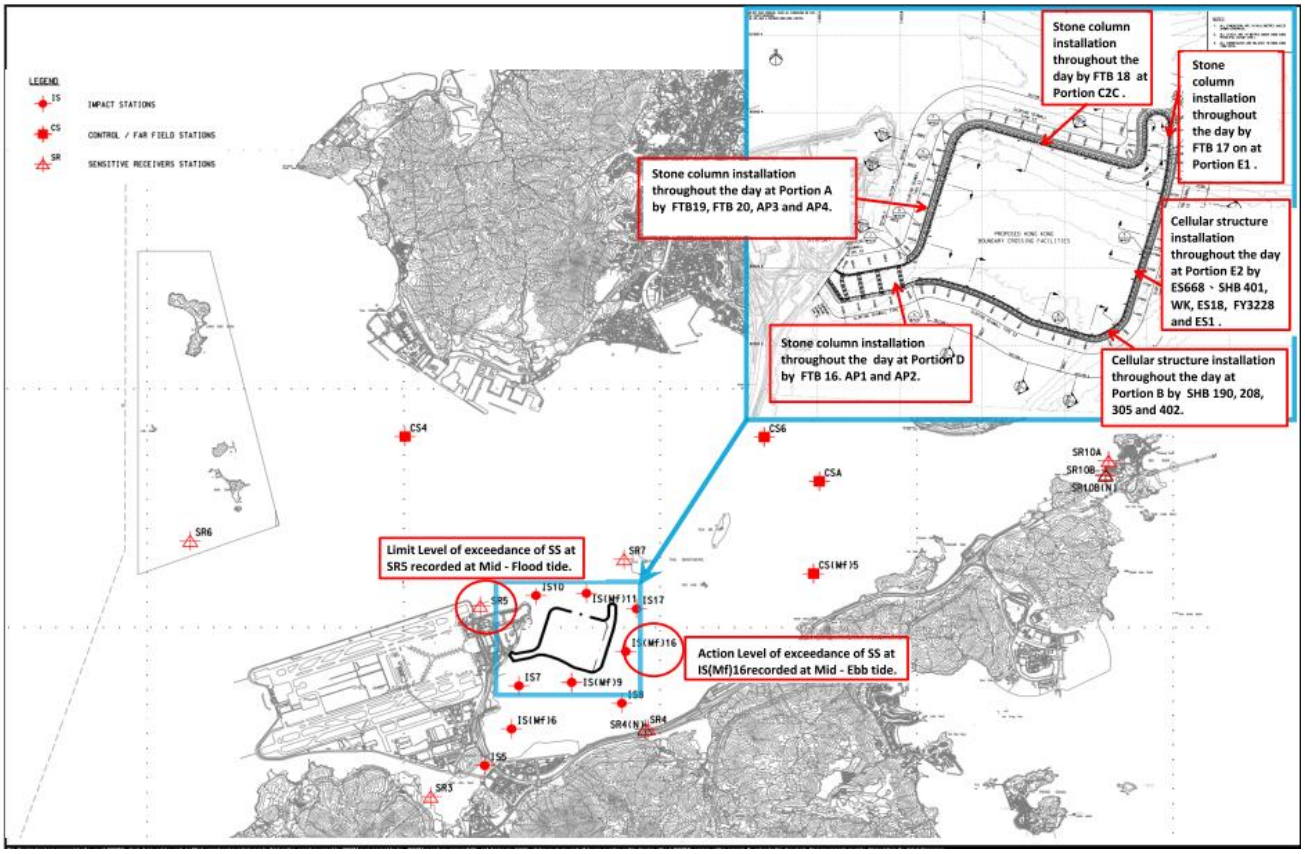
Table 3.5 Summary of Water Quality Exceedances in March-May 2013

Station	Exceedance Level	DO (S&M)		DO (Bottom)		Turbidity		SS		Total	
		Ebb	Flood	Ebb	Flood	Ebb	Flood	Ebb	Flood	Ebb	Flood
IS5	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
IS(Mf)6	Action	0	0	0	0	0	0	0	**1 (8 May 13)**	0	**1**
	Limit	0	0	0	0	0	0	0	0	0	0
IS7	Action	0	0	0	0	0	0	0	**1 (8 May 13)**	0	**1**
	Limit	0	0	0	0	0	0	0	0	0	0
IS8	Action	0	0	0	0	0	0	0	**2 (10 Apr & 8 May, 13)**	0	**2**
	Limit	0	0	0	0	0	0	0	0	0	0
IS(Mf)9	Action	0	0	0	0	0	0	**1 (8 May 13)**	**1 (8 May 13)**	**1**	**1**
	Limit	0	0	0	0	0	0	0	0	0	0
IS10	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
IS(Mf)11	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
IS(Mf)16	Action	0	0	0	0	0	0	**1 (29 Mar 13)**	**1 (22 Apr 13)**	**1**	**1**
	Limit	0	0	0	0	0	0	0	0	0	0
IS17	Action	0	0	0	0	0	**1 (29 Apr 13)**	0	0	0	**1**
	Limit	0	0	0	0	0	0	0	0	0	0
SR3	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
SR4(N)	Action	0	0	0	0	0	0	0	**1 (10 Apr 13)**	0	**1**
	Limit	0	0	0	0	0	0	0	0	0	0
SR5	Action	0	0	0	0	0	0	0	**1 (26 April, 13**	0	**1**
	Limit	0	0	0	0	0	0	0	**1 (29 Mar 13)**	0	**1**
SR6	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0

Station	Exceedance Level	DO (S&M)		DO (Bottom)		Turbidity		**SS**		**Total**	
		Ebb	Flood	Ebb	Flood	Ebb	Flood	**Ebb**	**Flood**	**Ebb**	**Flood**
SR7	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
SR10A	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
SR10B (N)	Action	0	0	0	0	0	0	0	0	0	0
	Limit	0	0	0	0	0	0	0	0	0	0
Total	**Action**	0	0	0	0	0	0	0	0	**11 (29 Mar 2013; 10, 22 26 & 29 Apr 2013; 8 May 2013)**	
	Limit	0	0	0	0	0	0	0	0	**1(29 Mar 13)**	

Note: S: Surface;
M: Mid-depth;

3.3.4 One (1) Limit and Action (1) Limit Level exceedance were recorded at during mid flood tide at SR5 and mid ebb tide at IS(Mf)16 respectively on 29 Mar 13. The investigation results show that the action and limit level exceedance were non-project related.



3.3.4.1 As informed by the Contractor, stone column installation was carried out throughout the day at Portion D by FTB 16, AP1 and AP2; at Portion A by FTB19, FTB 20, AP3 and AP4; at Portion C2c by FTB 18 and at Portion E1 by FTB 17. Cellular structure installation works was conducted at Portion E2 by ES668、SHB 401, WK, ES18, FY3228 and ES1 and at Portion B by SHB190, 208, 305 and 402..

3.3.4.2 Exceedances were not due to marine based construction works of the Project because:

3.3.4.3 For exceedance recorded at SR5 during mid flood tide, since monitoring stations IS10 and IS(Mf)11 are considered downstream and closer to the active works than monitoring station SR5 and the Suspended Solids values recorded at IS10 and IS(Mf)11 are all below the Action and Limit Level during same tide on the same day. The water quality noted at downstream of and closer to active works were not adversely affected by active works.Hence it is considered that the exceedance recorded at SR5 are not related to the Project.

3.3.4.4 For action level exceedance of suspended solid recorded at IS(Mf)16 during mid ebb tide, stone column installations were carried out at almost the same locations on 27, 29 Mar 13 and 1 April 13, but all Suspended Solids results recorded at all monitoring location on 27 Mar 13 and 1 Apr 13 are all below the Action and Limit Level. Which indicates that stone column installation is unlikely to contribute to the action level exceedance recorded at IS(Mf)16.

3.3.4.5 When impact water quality monitoring was carried out during mid ebb and mid flood tide at monitoring location IS(Mf)16 on 29 Mar 13, yellow brown color of sea water was noted but no silty plume was observed to flow from the inside to the outside of the site boundary.

3.3.4.6 Cellular structure installation work was conducted at Portion E2 by ES668、SHB 401, WK, ES18, FY3228 and ES1 and at Portion B by SHB190, 208, 305 and 402 during mid ebb tide on 29 Mar

13 but cellular structure installation was considered unlikely to contribute to elevation of suspended solid.

3.3.4.7 The exceedances were likely due to local effects in the vicinity of SR5 and IS(Mf)16.

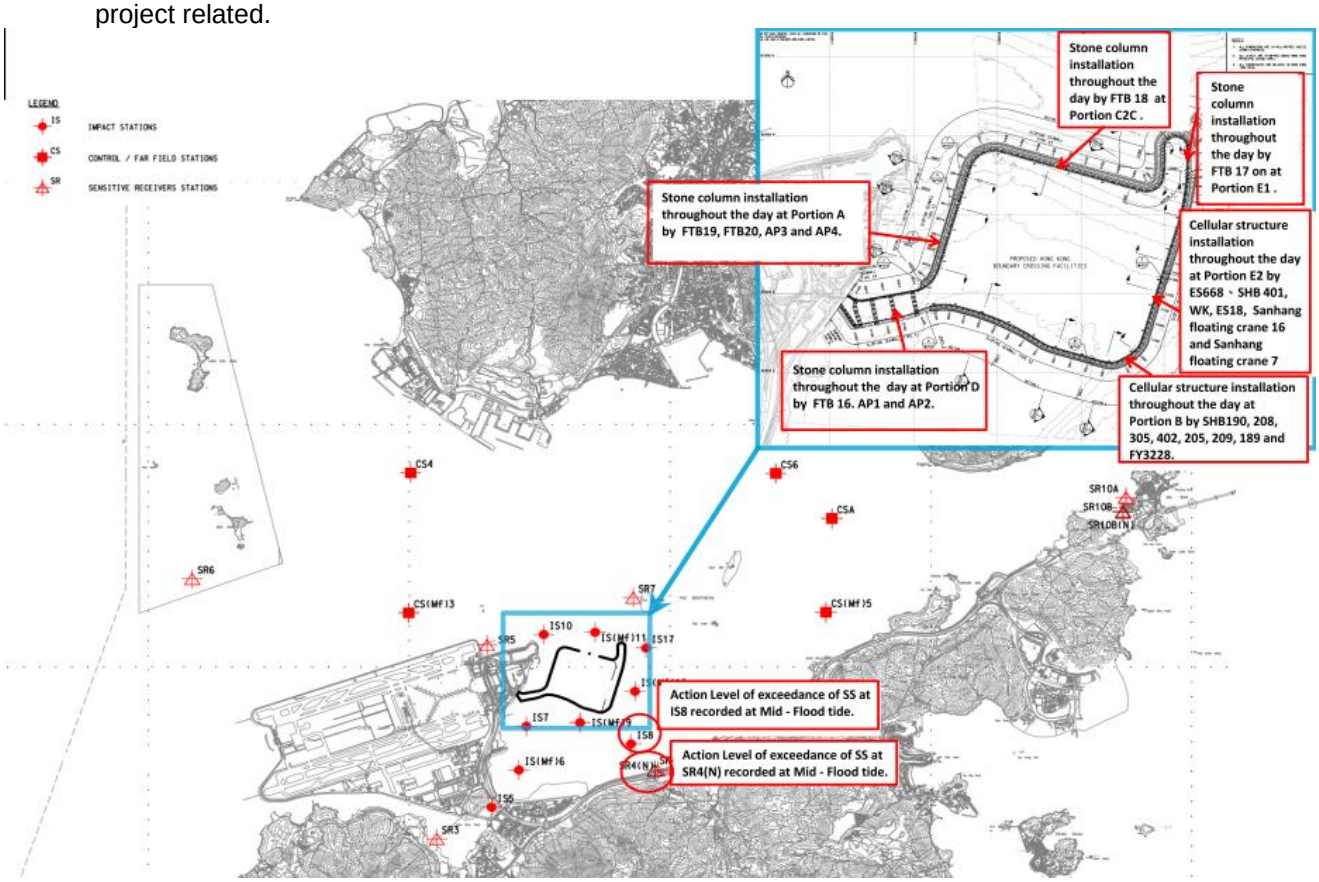
3.3.4.8 Floating type silt curtains were provided around the whole works area. In addition, it was noted that the Contractor swiftly rectified the perimeter silt curtain in particular the portions which defects were observed on 28 March 13 to ensure the sediment plume generated by construction activities could be prevented from discharging to areas outside the site boundary.

3.3.4.9 The Contractor was reminded to carry out maintenance work once defects were found.

3.3.4.10 As informed by the Contractor, maintenance work of the silt curtain was carried out on a daily basis except Sunday and public holiday.

3.3.5 One (1) Action Level exceedance of turbidity (NTU) was recorded at during mid flood tide at IS17 on 29 April 13. Four (4) Action Level exceedances of SS were recorded during the reporting period. Where two (2) Action Level exceedance were recorded at during mid flood tide at IS8 and SR4(N) respectively on 10 April 13, one (1) were recorded at during mid flood tide at IS(Mf)16 on 22 April 13; one (1) was recorded during mid flood tide at SR5 on 26 April 13.

3.3.5.1 For the two (2) Action Level exceedance were recorded at during mid flood tide at IS8 and SR4(N) respectively on 10 April 13. The investigation results show that the action exceedances were non-project related.



3.3.5.2 As informed by the Contractor, stone column installation was carried out throughout the day at Portion D by FTB 16, AP1 and AP2; at Portion A by FTB 19, FTB 20, AP3 and AP4; at Portion C2c by FTB 18 and at Portion E1 by FTB 17. Cellular structure installation works were conducted at Portion E2 by ES668、SHB 401, WK, ES18, Sanhang floating crane 16 and Sanhang floating crane 7 and at Portion B by SHB190, 208, 305, 402, 205, 209, 189 and FY3228.

3.3.5.3 Exceedances were not due to marine based construction works of the Project because:

3.3.5.4 IS(Mf)9 and IS(Mf)16 are located closer to the active works than monitoring station IS8 and SR4(N). Depth Averrage Suspended Solids (SS) values (in mg/L) recorded during the flood tide on the same day at IS(Mf)9 and IS(Mf)16 were below the Action and Limit Level.

3.3.5.5 The monitoring location of monitoring station IS8 and SR4(N) are considered upstream to the active works of this project. Therefore it was unlikely that the exceedances recorded at IS8 and SR4(N) were due to active construction activities of this project.

3.3.5.6 Cellular structure installation works were conducted at Portion E2 and at Portion B by construction vessels during mid flood tide on 10 Apr 13 but cellular structure installation was considered unlikely to contribute to elevation of Suspended Solids.

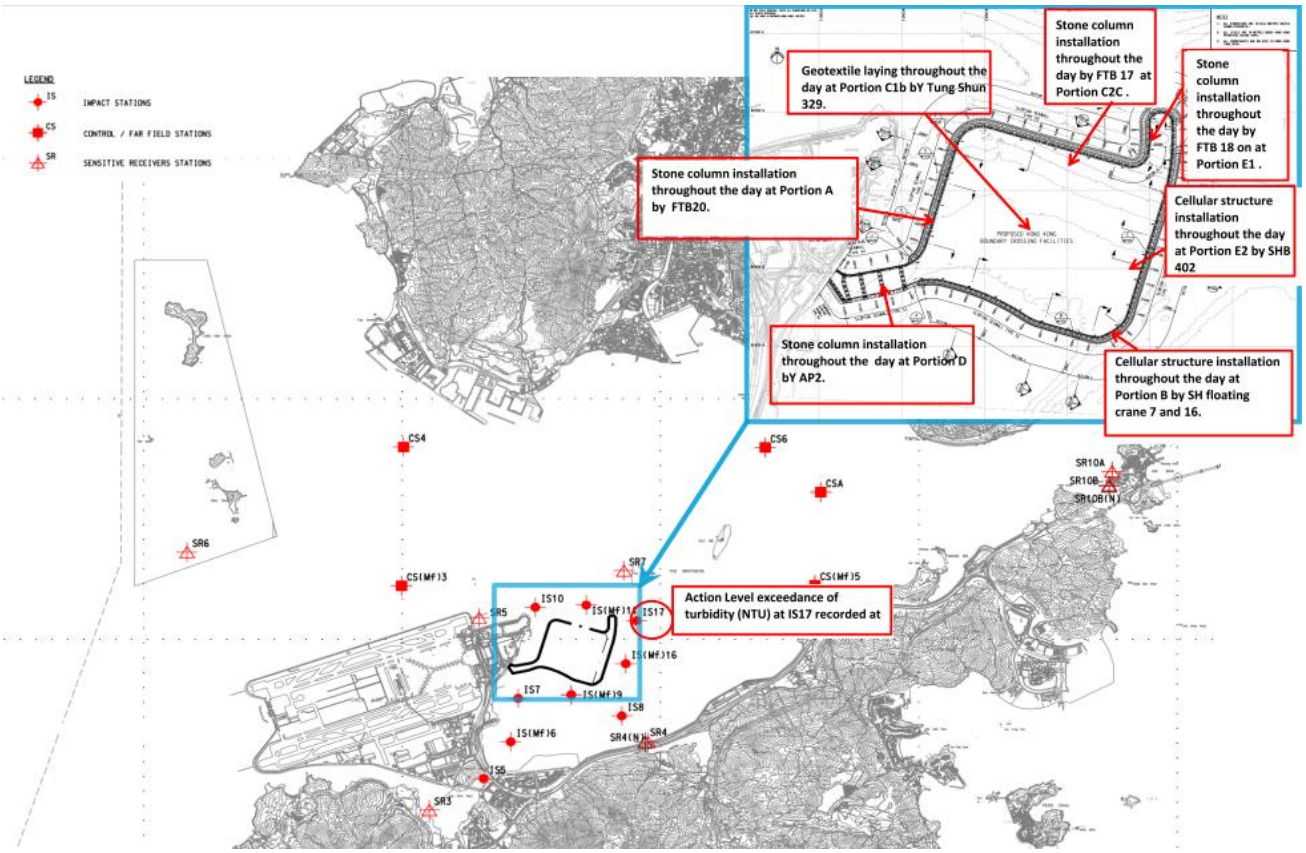
3.3.5.7 The exceedances were likely due to local effects in the vicinity of IS8 and SR4(N).

3.3.5.8 Nevertheless, the Contractor was reminded to ensure provision of ongoing maintenance to the silt curtains.

3.3.5.9 Maintenance work of the silt curtain was carried out by the Contractor on a daily basis except Sunday and public holiday.

3.3.5.10 The investigation results show that the action and limit level exceedance were non-project related.

3.3.6 For the one (1) Action Level exceedance were recorded at during mid flood tide at IS17 on 29 April 13. The investigation results show that the action exceedances were non-project related.



3.3.6.1 Stone column installation was carried out throughout the day at Portion D by AP2 and AP4; at Portion A by FTB 20; at Portion C2c by FTB 17 and at Portion E1 by FTB 18. Cellular structure installation works was conducted at Portion E2 by SHB 402; at Portion B by SH Floating Crane 7 and 16; Geotextile laying at Portion C1b by Tung Shun 329.

3.3.6.2 For action level exceedance of depth averaged turbidity (in NTU) recorded at IS17 during mid ebb tide, stone column installations were carried out at almost the same locations on 26, 29 Apr 13 and 1 May 13, but all depth averaged turbidity (in NTU) results recorded at all monitoring location on 26 Apr 13 and 1 May 13 were all below the Action and Limit Level. Which indicates that stone column installation is unlikely to contribute to the action level exceedance recorded at IS17?

3.3.6.3 When impact water quality monitoring was carried out during mid ebb at monitoring location IS17 on 29 April 13, no discoloration of sea water was observed and no silty plume were observed to flow from the inside to the outside of the site boundary.

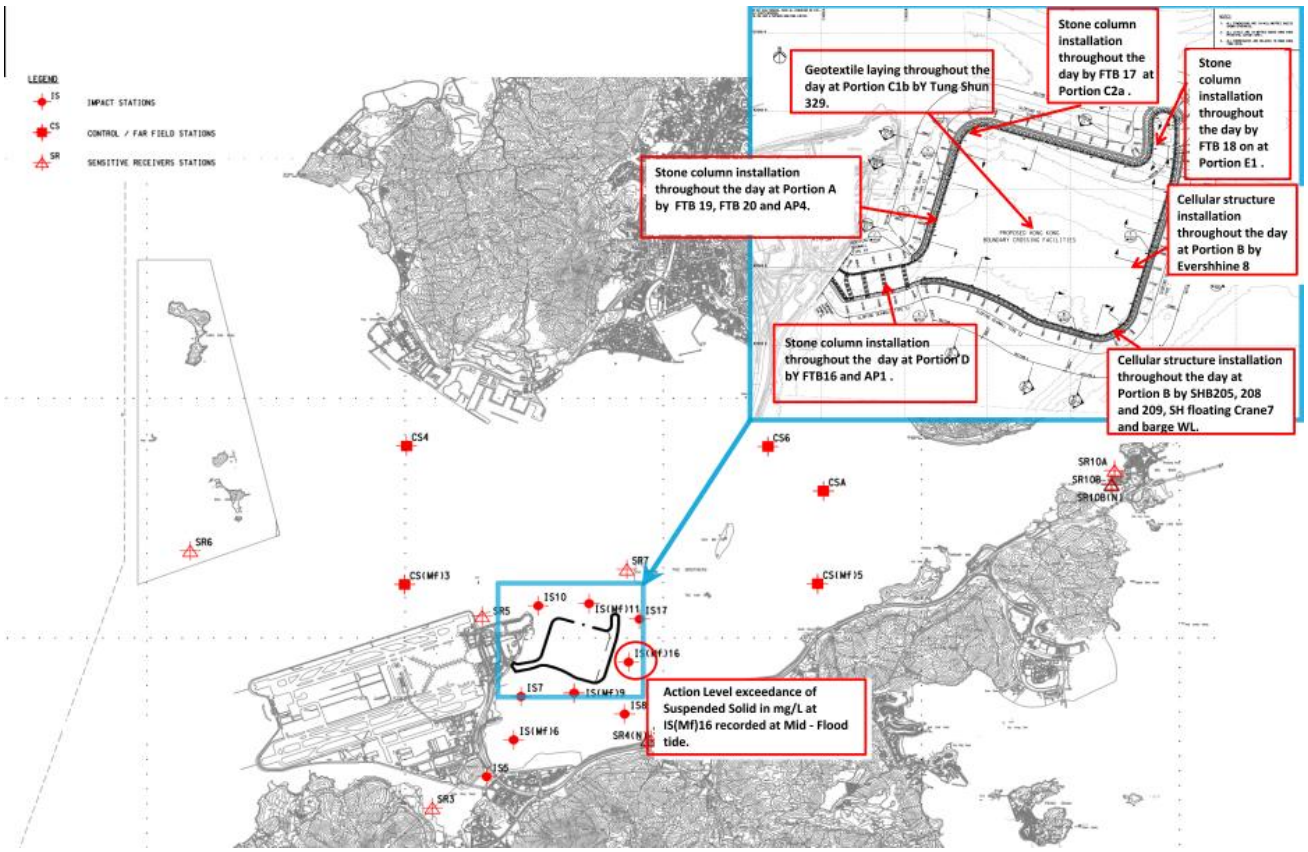
3.3.6.4 Cellular structure installation works was conducted at Portion E2 by SHB 402; at Portion B by SH Floating Crane 7 and 16 but cellular structure installation was considered unlikely to contribute to elevation of depth averaged turbidity (in NTU).

3.3.6.5 The exceedances were likely due to local effects in the vicinity of IS17.

3.3.6.6 Nevertheless, the Contractor was reminded to ensure provision of ongoing maintenance to the silt curtains.

3.3.6.7 Maintenance work of the silt curtain was carried out by the Contractor on a daily basis except Sunday and public holiday.

3.3.7 For the one (1) Action Level exceedance were recorded at during mid flood tide at IS(Mf)16 on 22 April 13. Stone column installation was carried out throughout the day at Portion D by AP1 and FTB16; at Portion A by FTB 19, 20 and AP4; at Portion C2a by FTB 17 and geotextile laying was carried out throughout the day by Tung Shun 329 at Portion C2a, at Portion E1 by FTB 18. Cellular structure installation works was conducted at Portion B by SHB402, SHB205, SHB208 and SHB209.



3.3.7.1 Exceedances were not due to marine based construction works of the Project because:

3.3.7.2 For action level exceedance of depth averaged SS (in mg/L) recorded at IS(Mf)16 during mid flood tide, stone column installations were carried out at almost the same locations on 19, 22 and 24 Apr 13, but all depth averaged SS (in mg/L) results recorded at all monitoring location on 19 and 24 Apr 13 13 were all below the Action and Limit Level. Which indicates that stone column installation is unlikely to contribute to the action level exceedance recorded at IS(Mf)16.

3.3.7.3 When impact water quality monitoring was carried out during mid flood tide at monitoring location IS(Mf)16 on 22 April 13, no discoloration of sea water was observed and no silty plume were observed to flow from the inside to the outside of the site boundary.

3.3.7.4 Cellular structure installation works was conducted at Portion B by SHB402, SHB205, SHB208 and SHB209 but cellular structure installation was considered unlikely to contribute to elevation of depth averaged SS (in mg/L).

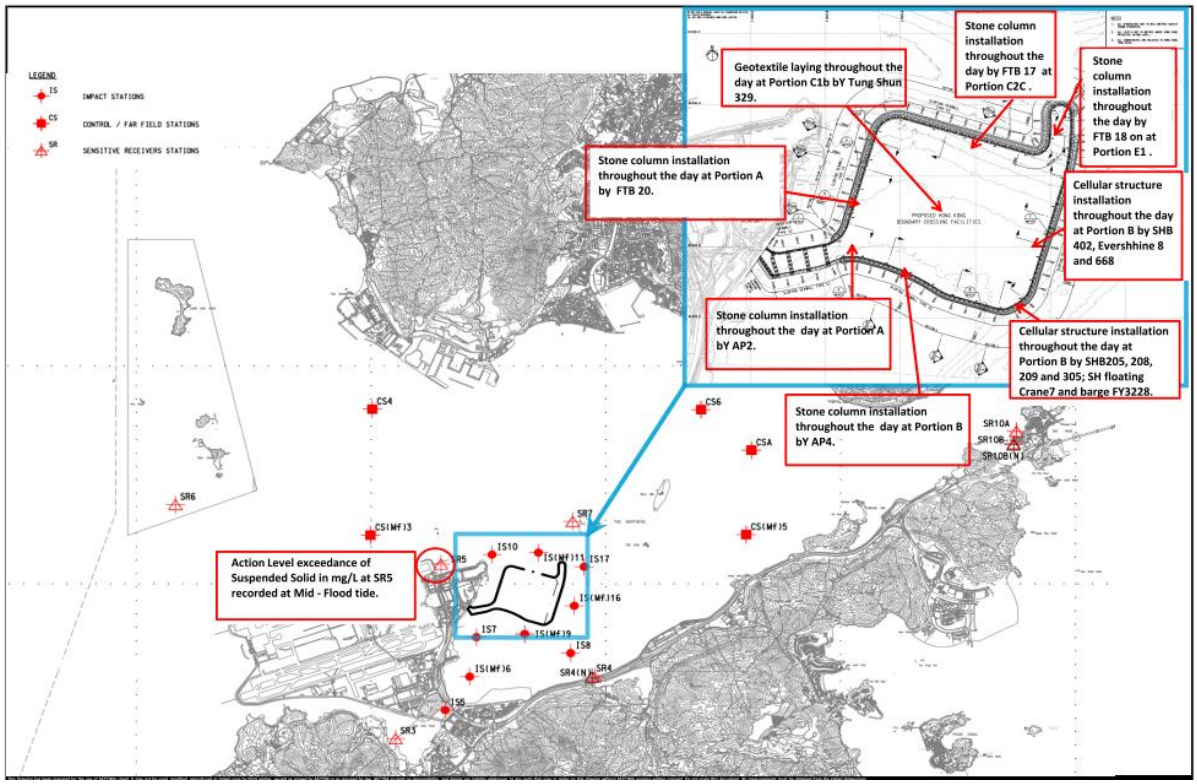
3.3.7.5 Location of monitoring station IS(Mf)16 is considered upstream to active works during mid flood tide and therefore it is unlikely that the elevation of suspended solid is caused by active works.

3.3.7.6 The exceedances were likely due to local effects in the vicinity of IS(Mf)16.

3.3.7.7 Nevertheless, the Contractor was reminded to ensure provision of ongoing maintenance to the silt curtains. The Contractor was reminded to carry out maintenance work once defects were found.

3.3.7.8 Maintenance work of the silt curtain was carried out by the Contractor on a daily basis except Sunday and public holiday.

3.3.8 For the one (1) Action Level exceedance were recorded at during mid flood tide at SR5 on 26 April 13. Stone column installation was carried out throughout the day at Portion A by AP2 and FTB 20; at Portion B by AP4; at Portion C2c by FTB 17 and at Portion E1 by FTB 18. Cellular structure installation works was conducted at Portion B by SHB 402, Evershine 8 and 668, SHB 205, 208, 209 and 305, SH Floating Crane 7 and FY3228; Geotextile laying at Portion C1b by Tung Shun 329.



3.3.8.1 Exceedance was not due to marine based construction works of the Project because:

3.3.8.2 Impact Stations IS10 and IS(Mf)11 which are considered downstream and closer to the works than Impact Station SR5. Since the Suspended Solids values recorded at IS10 and IS(Mf)11 are all below the Action and Limit Level during same tide on the same day. The water quality noted at downstream of and closer to active works were not adversely affected by active works.Hence it is considered that the exceedance recorded at SR5 are not related to the Project.

3.3.8.3 Same type of works was carried out at almost the same location on 24 April13 and 29 April13 but Suspended Solids values recorded at SR5 on 24 April13 and 29 April13 are all below the Action and Limit Level during the same tide on the same day.

3.3.8.4 The exceedance was likely due to local effects in the vicinity of SR5.

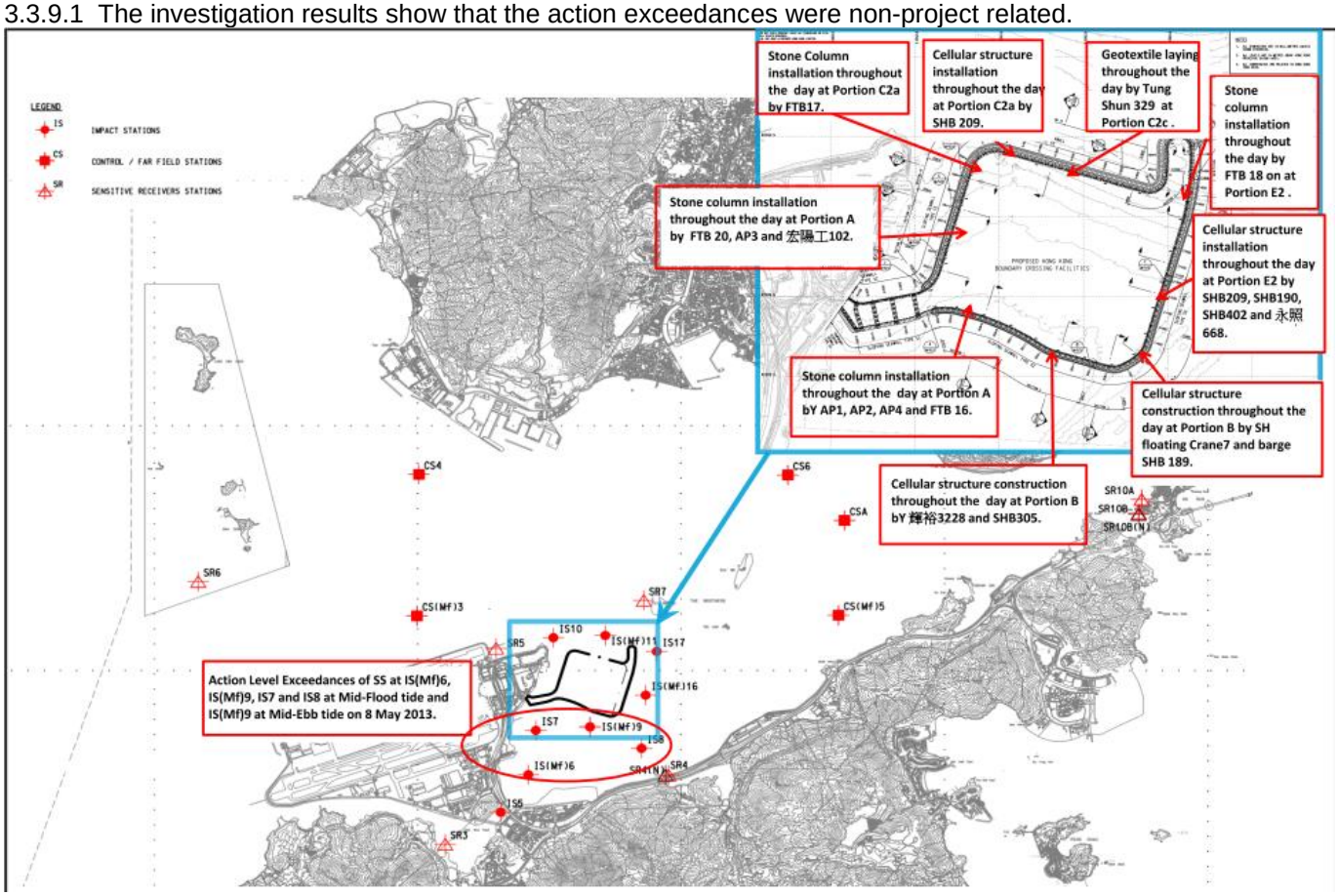
3.3.8.5 Nevertheless, the Contractor was reminded to ensure provision of ongoing maintenance to the silt curtains.

3.3.8.6 The Contractor was reminded to carry out maintenance work once defects were found.

3.3.8.7 Maintenance work of the silt curtain was carried out by the Contractor on a daily basis except Sunday and public holiday.

3.3.9 Five (5) Action Level Exceedances of SS at IS(Mf)6, IS(Mf)9, IS7 and IS8 at Mid-Flood tide and IS(Mf)9 at Mid-Ebb tide were recorded on 8 May 2013.

3.3.9.1 The investigation results show that the action exceedances were non-project related.



3.3.9.2 For type, location and duration of works carried out on 8 May 2013, please refer to the above layout map.

3.3.9.3 Exceedances were not due to marine based construction works of the Project because:

3.3.9.4 Same work at same portion was carried out on 6 and 10 May 13 while no exceedance was recorded on these two days at the same tide.

3.3.9.5 The water depth of IS(Mf)9 was 3.3m and 3.4m during mid ebb tide and mid flood tide respectively. The water depth of IS(Mf)6, IS7 and IS8 were 3.3m, 3.4m and 3.6m respectively during mid flood tide.

3.3.9.6 Strong wind and rough sea condition were experienced during the monitoring period, which is likely to affect the ambient water quality in such shallow water condition.

3.3.9.7 When impact water quality monitoring was carried out at IS(Mf)6, IS(Mf)9, IS7 and IS8 at Mid-Flood tide and IS(Mf)9 at Mid-Ebb tide on 8 May 2013, no silty plume was observed to flow from the inside to the outside of the site boundary.

3.3.9.8 No exceedance was recorded at IS(Mf)16 and IS17 which are considered downstream of active works during ebb tide and no exceedance was recorded at IS10 and IS(Mf)11 which are considered downstream of active works during flood tide.

3.3.9.9 The exceedances recorded were likely due to local effects in the vicinity at IS(Mf)6, IS(Mf)9, IS7 and IS8.

3.3.9.10 The exceedances were considered as Non-Project Related.

3.3.9.11 Nevertheless, the Contractor was reminded to ensure provision of ongoing maintenance to the silt curtains.

3.3.9.12 The Contractor was reminded to carry out maintenance work once defects were found.

3.3.9.13 Maintenance work of the silt curtain was carried out by the Contractor on a daily basis except Sunday and public holiday.

3.3.10 The graphical plots of the trends of the monitoring results are provided in Appendix G. No specific trend of the monitoring results or existence of persistent pollution source was noted.

3.4 Dolphin Monitoring

3.4.1 In accordance with the Project Specific EM&A Manual, pre-set and fixed transect line vessel based dolphin survey was required in two AFCD designated areas (Northeast Lantau (NEL) and Northwest Lantau (NWL) survey areas). The impact dolphin monitoring at each survey area should be conducted twice per month.

3.4.2 The impact dolphin monitoring conducted is vessel-based and combines line-transect and photo-ID methodology, which have adopted similar survey methodologies as that adopted during baseline monitoring to facilitate comparisons between datasets.

3.4.3 The layout map of impact dolphin monitoring have been provided by AFCD and is shown in Figure 4.

3.4.4 The effort summary and sighting details during the reporting quarter are shown in the Appendix H. A summary of key findings of the dolphin surveys completed during the reporting quarter is shown below:

Table 3.6 Summary of Key Dolphin Survey Findings in Mar 2013- May 2013

Number of Impact Surveys Completed^	6
Survey Distance Travelled under Favourable On- Effort Condition	668.6km
Number of Sightings	22 sightings (13 sightings are ”on effort” (which are all under favourable condition), 9 “sightings are opportunistic”)
Number of dolphin individual sighted	72 individuals (the best estimated group size)
Dolphin Encounter Rate#	NEL: 0.0 NWL:3.1
Dolphin Group Size	Average of 3.3 Varied from 1-12 individuals
Most Often frequent dolphin sighting area	Sha Chau and Lung Kwu Chau Marine Park area

Remarks:
^ Completion of line transect survey of NEL and NWL survey area once was counted as one complete survey.
# Dolphin Encounter Rate = (Sum of 1^{st} 2^{nd}, 3^{rd} month’s total sighting/ Sum of 1^{st} 2^{nd}, 3^{rd} month’s total effort)*100km (encounter rates are calculated using on effort sightings made under favourable conditions only.)

3.4.5 One (1) Limit level exceedance was recorded in the reporting quarter. The investigation results showed that there is no evidence that exceedances are related to Project works are annexed in Appendix L. Actions were taken according to the Event and Action Plan for impact dolphin monitoring. Please refer to Appendix L for details of action taken. Below table

Table 3.7 Summary of STG and ANI encounter rates in Mar 2013- May 2013

	NEL	NWL	Level Exceeded
STG*	0.00	3.00	Limit Level
ANI**	0.00	8.60	

*Quarterly Average Encounter Rate of Number of Dolphin Sightings (STG) presents averaged encounter rates of the three monitored months in terms of groups per 100km per survey event.
STG Encounter rate = (Average of (total number sighting/total effort) of 1st and 2nd completed survey# of 1st month+ Average of (total number sighting/total effort) of 1st and 2nd completed survey# of 2nd month + Average of (total number sighting/total effort) of 1st and 2nd completed survey# of 3rd month)/3*100km
**Quarterly Average Encounter Rate of Total Number of Dolphins (ANI) presents averaged encounter rates of the three monitored months in terms of individuals per 100km per survey event.
ANI Encounter rate = (Average of (total number of Individual/total effort) of 1st and 2nd completed survey# of 1st month+ Average of (total number of Individual/total effort) of 1st and 2nd completed

survey# of 2nd month + Average of (total number of Individual/total effort) of 1st and 2nd completed survey# of 3rd month +)/3*100km

3.4.6 Details of the comparison and analysis methodology and their findings and discussions are annexed in Appendix H.

3.4.7 It is noted that preparation works for other, non HKBCF Project started in January 2013 and have continued throughout March-May 2013. As such, there is increased boat traffic and underwater works in the southern sector of NWL.

3.5 Environmental Site Inspection and Audit

3.5.1 Site Inspections were carried out on a weekly basis to monitor the implementation of proper environmental pollution control and mitigation measures for the Project. In the reporting quarter, 13 site inspections were carried out. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site audits.

3.5.2 Particular observations during the site inspections are described below:

Air Quality

3.5.3 No adverse observation was identified in the in the reporting Quarter.

Noise

3.5.4 An idle air compressor was found without a valid noise emission label on FTB19 and barge Sun Moon Kee. The Contractor was reminded to stick a valid noise emission label onto the compressor prior to operation of the compressor. (Reminder)

Water Quality

3.5.5 Defects at parts of the perimeter silt curtain at portions E1, C2a and C2c were rectified. The Contractor was reminded to keep monitor and well maintain of the silt curtain more frequently to ensure the silt curtain are fully functional. (Closed)

3.5.6 One of the existing bunding was found too low on barge FTB 17 and FTB19. The Contractor was reminded to enhance the height of the existing bunding to effectively contain potential oil leakage. The Contractor enhanced the height of the existing bunding to effectively contain potential oil leakage. (Closed)

3.5.7 The screw at the outlet of a drip tray on barge AP4, FTB20, Fai Yu 3228, SHB 208 and SHB402 was observed missing. The Contractor provided effective mitigation measures to effectively seal the outlet of the drip tray to prevent potential oil seepage in April 2013. The Contractor was advised to provide effective mitigation measures to effectively seal the outlet of the all drip tray to prevent potential oil seepage. (Closed)

3.5.8 Generator was observed without bunding or drip tray on Sanhang Floating Crane 7. The Contractor was reminded to provided mitigation measures such as bunding or drip tray to generator. The Contractor rectified the situation and provided bunding to generator. (Closed)

3.5.9 The silt curtain enclosing the stone column installation works was observed removed and as informed by the Contractor, this is due to maintenance of the stone column installation facility. The Contractor was reminded to install a layer of silt curtain near the active stone column installation points. (Reminder)

Chemical and Waste Management

3.5.10 Oil drums were found improperly stored on barge SHB 209, Fai Yui 3228, FTB19 and SHB 205, Sun Moon Kee. The Contractor immediately provided mitigation measures and put the oil drum inside bunding or remove the oil drum. The Contractor was reminded to provide mitigation measures such as drip tray or bunding to all oil drums. (Reminder)

3.5.11 Vibratory clamps were found improperly stored on barge SHB305. The Contractor should provide proper measures, like drip trays and tarpaulin sheet coverage, to retain any leaked oil from the plants. Vibratory clamps found improperly stored on barge SHB305 were removed in the reporting month. (Closed)

3.5.12 Oil drums were found without proper labels on barge FTB 18, FTB 19 and FTB17. The Contractor provided mitigation measures and labeled the oil drums. The Contractor was reminded to provide mitigation measures such as labeling to all oil drums. The Contractor provided mitigation measures such as labeling to all oil drums. (Closed)

3.5.13 General waste was observed uncovered on barge Fai Yui 3228 and SHB305. The Contractor rectified the condition upon notification by providing bin bags to waste and relocated them to a waste collection point. The Contractor was reminded to keep the barge surface clean and tidy. (Reminder)

3.5.14 Oil stains were observed on the barge surface of barge SHB 208 and FTB 20. The Contractor was reminded to clear the oil stain using absorbent material and dispose of as chemical waste. The Contractor was cleared the oil stain using absorbent material and dispose of as chemical waste. (Closed)

3.5.15 Oil was observed within the mechanical parts of a machine on FTB18. The Contractor was reminded to prevent oil being transferred from inside the drip tray to the barge surface. (Reminder)

3.5.16 A battery and chemical container was observed placed on barge FTB20 without drip tray. The Contractor was relocated that battery and chemical container inside the drip tray immediately. (Closed)

Landscape and Visual Impact

3.5.17 No adverse observation was identified in the reporting quarter.

Others

3.5.18 No adverse observation was identified in the reporting quarter.

3.5.19 The Contractor has rectified most of the observations as identified during environmental site inspection in the reporting quarter. Rectifications of remaining identified items are undergoing by the Contractor. Follow-up inspections on the status on provision of mitigation measures will be conducted to ensure all identified items are mitigated properly.

4 ADVICE ON THE SOLID AND LIQUID WASTE MANAGEMENT STATUS

4.1 Summary of Solid and Liquid Waste Management

4.1.1 The Contractor registered as a chemical waste producer for this project. Sufficient numbers of receptacles were available for general refuse collection and sorting.

4.1.2 As advised by the Contractor, 679,270.6 m^3 of imported fill were imported for the Project use in the reporting quarter. 3200.0 L of chemical waste were generated and disposed of in the reporting quarter. 16.9 tonnes of general refuse were generated and disposed of in the reporting quarter. Summary of waste flow table is detailed in Appendix I.

4.1.3 The Contractor is advised to properly maintain on site C&D materials and wastes collection, sorting and recording system, dispose of C&D materials and wastes at designated ground and maximize reuse / recycle of C&D materials and wastes. The Contractor is reminded to properly maintain the site tidiness and dispose of the wastes accumulated on site regularly and properly.

4.1.4 The Contractor is reminded that chemical waste containers should be properly treated and stored temporarily in designated chemical waste storage area on site in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes.

5 IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES

5.1 Implementation Status of Environmental Mitigation Measures

5.1.1 In response to the site audit findings, the Contractors carried out corrective actions.

5.1.2 A summary of the Implementation Schedule of Environmental Mitigation Measures (EMIS) is presented in Appendix C. Most of the recommended mitigation measures. Moreover, regular review and checking on the construction methodologies, working processes and plants were carried out to ensure the environmental impacts were kept minimal and recommended environmental mitigation measures were implemented effectively.

5.1.3 Training of marine travel route for marine vessels operator was given to relevant staff and relevant records were kept properly.

5.1.4 Regarding the implementation of dolphin monitoring and protection measures (i.e. implementation of Dolphin Watching Plan, Dolphin Exclusion Zone and Silt Curtain integrity Check), regular checking were conducted by the experienced MMOs within the works area to ensure no dolphin was trapped by the enclosed silt curtain systems. Any dolphin spotted within the enclosed silt curtain systems was reported and recorded. Relevant procedures were followed and measures were well implemented. Silt curtain systems were also inspected timely in accordance to the submitted plan. All inspection records were kept properly.

5.1.5 Acoustic decoupling measures on noisy plants on construction vessels were checked regularly and these measures were well implemented.

6 SUMMARY OF EXCEEDANCES OF THE ENVIRONMENTAL QUALITY PERFORMANCE LIMIT

6.1 Summary of Exceedances of the Environmental Quality Performance Limit

6.1.1 For air quality monitoring, no Action/Limit Level exceedance of 1-hour TSP results was recorded in the reporting quarter. However, one (1) 24-hour TSP results exceeded the Action Level at monitoring station AMS7, three (3) 24-hour TSP results exceeded the Action Level at monitoring station AMS3A and two (2) 24-hour TSP result exceeded the Limit Level at monitoring station AMS3A. The investigation results showed that the action and limit level exceedances were non-project related.

6.1.2 For noise monitoring, due to one documented complaint is received; one (1) Action Level Exceedance of construction noise was recorded in the reporting quarter. The investigation results show that the action level exceedance was non-project related. No Limit Level Exceedance of construction noise was recorded in the reporting quarter.

6.1.3 For impact water quality monitoring, ten (10) Action Level exceedances were recorded at measured suspended solids (SS) values (in mg/L) in the reporting quarter, one (1) Limit Level exceedance was recorded at measured suspended solids (SS) values (in mg/L) in the reporting quarter and 1 Action Level exceedance was recorded at turbidity (NTU) in the reporting quarter. Investigation result show that the exceedances were not due to the Project works.

6.1.4 One (1) Limit level exceedance was recorded in the reporting quarter. The investigation results showed that there is no evidence that exceedances are related to Project works are annexed in Appendix L. Actions were taken according to the Event and Action Plan for impact dolphin monitoring. Please refer to Appendix L for details of action taken.

6.1.5 Cumulative statistics on exceedances is provided in Appendix J.

7 SUMMARY OF COMPLAINTS, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

7.1 Summary of Environmental Compliants, Notification of Summons and Successful Prosecutions

7.1.1 The Environmental Complaint Handling Procedure is annexed in Figure 5.

7.1.2 One (1) complaint was referred by EPD to ET on 4 March 13 regarding the construction noise impact from cranes operating from the barges for the Hong Kong –Zhuhai-Macao Bridge Hong Kong Project generating squeak noise in the evening of 1 Mar 2013 causing annoyance to him/her. The investigation results show that the complaint was non-project related.

7.1.2.1 With refer to the site daily of 1 Mar 13 provided by the Contractor, 1 cranes operated at Zone S3 and S4 respectively and 4 cranes operated in Zone C of CNP No.RS0122-13 (please see attached Plan no.1 for respective zones). Squeak noise or other abnormal noise was unlikely to be generated by their operation on 1 Mar 13. Moreover, considering the distance between reclamation area and Tung Chung residential area is around 1.8 km, the noise to the residential area should be low.

7.1.2.2 As informed by the Contractor, the tug boats, derrick barges, pelican barges working at the site of HKBCF have been maintained in good working condition and no squeak nor other abnormal noise emitted will cause annoyance to any person at any noise sensitive receiver which in compliance with the CNP no. RS0122-13.

7.1.2.3 As a result, the noise complaint was considered as non-project related.

7.1.2.4 Nevertheless, the Contractor was reminded to maintain tug boats, derricks barges and pelican barges in good working conditions from which neither squeak nor other abnormal noise emitted was a source of annoyance to any person at any noise sensitive receiver.

7.1.3 One (1) complaint was referred by EPD on 8 April 13 regarding oil dumping observed from various vessels operating for HZMB HK projects near Tung Chung Development Pier over the past few months. The investigation results showed that the complaint was non-project related.

7.1.3.1 The concerned area is not the anchoring point for vessels of this contract. Vessels shown in EPD's supporting document given via email on 8 April 13 are unlikely to belong to this contract.

7.1.3.2 Furthermore, no incident or leakage observation within HKBCF's site boundary and its vicinity on 27 Jan, 2,3,17 and 24 Mar; and 7 Apr 13 was reported.

7.1.3.3 Precautionary measures are implemented by the Contractor to minimize the possibilities of accidental spillage of oil:

- Training record shows that related toolbox talk training such as handling and storage of chemical waste for workers and frontline staff are conducted regularly.
- In addition, all chemical waste arising from Contractor's construction activities are packed, labeled and stored properly by the Contractor and collected by licensed waste collectors.
- Emergency drill for oil spillage was conducted on 8 August 2012 which allowed workers and frontline staff to familiar with the spill response procedures.
- As informed by the Contractor, all response action and incident reporting procedure would be carried out in compliance with the spill response plan if there is any accidental spillage of oil or chemical from construction activities of this contract.
- As informed by the Contractor, sufficient standard spill control materials are available on site for the removal of any oil leakage and refilling of the material will be provided when necessary.
-

7.1.3.4 After investigating the available information, the complaint was considered as not project-related.

7.1.3.5 The Contractor was recommended to continue implementing existing water quality mitigation measures.

7.1.3.6 Observation on a follow up visit made on 11 April 13 showed that there was no oil spillage observed from vessels of this Contract when carrying out joint site inspection audit.

7.1.3.7 As a result, the noise complaint was considered as non-project related.

7.1.4 One (1) complaint was referred by EPD on 23 May 13. This complaint was a follow-up of a previous complaint received by this Department on 8 April 2013 regarding oil dumping observed from various vessels operating for HZMB HK projects near Tung Chung Development Pier over the past few months.

7.1.4.1 The concerned area is not the anchoring point for vessels of this contract. Vessels shown in EPD's supporting document given via email on 23 May 13 are unlikely to belong to this contract.

7.1.4.2 Furthermore, no incident or leakage observation within HKBCF's site boundary and its vicinity on 27 Jan, 2,3,17 and 24 Mar; and 7 Apr 13 was reported.

7.1.4.3 Precautionary measures are implemented by the Contractor to minimize the possibilities of accidental spillage of oil:

- Training record shows that related toolbox talk training such as handling and storage of chemical waste for workers and frontline staff are conducted regularly.
- In addition, all chemical waste arising from Contractor's construction activities are packed, labeled and stored properly by the Contractor and collected by licensed waste collectors.
- Emergency drill for oil spillage was conducted on 8 August 2012 which allowed workers and frontline staff to familiar with the spill response procedures.
- As informed by the Contractor, all response action and incident reporting procedure would be carried out in compliance with the spill response plan if there is any accidental spillage of oil or chemical from construction activities of this contract.

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7.1.4.4 As informed by the Contractor, sufficient standard spill control materials are available on site for the removal of any oil leakage and refilling of the material will be provided when necessary.

7.1.4.5 After investigating the available information, the complaint was considered as not project-related.

7.1.4.6 The Contractor was recommended to continue implementing existing water quality mitigation measures.

7.1.5 As informed by the Contractor on 6 June 2013. A complaint referred to the Contractor by EPD on 10 May 2013 regarding the scattered debris of silt curtain noted at Sha Lo Wan and Tung Chung Bay. Immediate inspection and clean up action was taken by the Contractor.

7.1.6 As informed by the Contractor on 9 May 13, one summons was received on 29 April 13 regarding the suspected violation case of Noise Control Ordinance (Cap.400) at Works Area WA4 on 31 Oct 2012. The details of the non-compliance, investigation actions taken including follow-up site inspection conducted out by the ET and rectification actions and preventive actions provided by the Contractor was summarized at section 7 of the Quarterly EM&A summary report for September 2012 – November 2012.

7.1.7 One (1) notification of summons was received in the reporting quarter.

7.1.8 No prosecution was received in the reporting quarter.

7.1.9 Statistics on complaints, notifications of summons and successful prosecutions are summarized in Appendix J.

8 COMMENTS, RECOMMENDATIONS AND CONCLUSIONS

8.1 Comments on mitigation measures

8.1.1 According to the environmental site inspections performed in the reporting quarter, the following recommendations were provided:

Air Quality Impact

- All working plants and vessels on site should be regularly inspected and properly maintained to avoid dark smoke emission.
- All vehicles should be washed to remove any dusty materials before leaving the site.
- Haul roads should be sufficiently dampened to minimize fugitive dust generation.
- Wheel washing facilities should be properly maintained and reviewed to ensure properly functioning.
- Temporary exposed slopes and open stockpiles should be properly covered.
- Enclosure should be erected for cement debagging, batching and mixing operations.
- Water spraying should be provided to suppress fugitive dust for any dusty construction activity.

Construction Noise Impact

- Quieter powered mechanical equipment should be used as far as possible.
- Noisy operations should be oriented to a direction away from sensitive receivers as far as possible.
- Proper and effective noise control measures for operating equipment and machinery on-site should be provided, such as erection of movable noise barriers or enclosure for noisy plants. Closely check and replace the sound insulation materials regularly
- Vessels and equipment operating should be checked regularly and properly maintained.
- Noise Emission Label (NEL) shall be affixed to the air compressor and hand-held breaker operating within works area.
- Better scheduling of construction works to minimize noise nuisance.

Water Quality Impact

- Regular review and maintenance of silt curtain systems, drainage systems and desilting facilities in order to make sure they are functioning effectively.
- Construction of seawall should be completed as early as possible.
- Regular inspect and review the loading process from barges to avoid splashing of material.
- Silt, debris and leaves accumulated at public drains, wheel washing bays and perimeter u-channels and desilting facilities should be cleaned up regularly.
- Silty effluent should be treated/ desilted before discharged. Untreated effluent should be prevented from entering public drain channel.
- Proper drainage channels/bunds should be provided at the site boundaries to collect/intercept the surface run-off from works areas.
- Exposed slopes and stockpiles should be covered up properly during rainstorm.

Chemical and Waste Management

- All types of wastes, both on land and floating in the sea, should be collected and sorted properly and disposed of timely and properly. They should be properly stored in designated areas within works areas temporarily.
- All chemical containers and oil drums should be properly stored and labelled.
- All plants and vehicles on site should be properly maintained to prevent oil leakage.
- All kinds of maintenance works should be carried out within roofed, paved and confined areas.
- All drain holes of the drip trays utilized within works areas should be properly plugged to avoid any oil and chemical waste leakage.
- Oil stains on soil surface and empty chemical containers should be cleared and disposed of as chemical waste.
- Regular review should be conducted for working barges and patrol boats to ensure sufficient measures and spill control kits were provided on working barges and patrol boats to avoid any spreading of leaked oil/chemicals.

Landscape and Visual Impact

- All existing, retained/transplanted trees at the works areas should be properly fenced off and regularly inspected.

8.2 Recommendations on EM&A Programme

8.2.1 The impact monitoring programme for air quality, noise, water quality and dolphin ensured that any deterioration in environmental condition was readily detected and timely actions taken to rectify any non-compliance. Assessment and analysis of monitoring results collected demonstrated the environmental impacts of the Project. With implementation of recommended effective environmental mitigation measures, the Project's environmental impacts were considered as environmentally acceptable. The weekly environmental site inspections ensured that all the environmental mitigation measures recommended were effectively implemented.

8.2.2 The recommended environmental mitigation measures, as included in the EM&A programme, effectively minimize the potential environmental impacts from the Project. Also, the EM&A programme effectively monitored the environmental impacts from the construction activities and ensure the proper implementation of mitigation measures. No particular recommendation was advised for the improvement of the programme.

8.3 Conclusions

8.3.1 The construction phase and EM&A programme of the Project commenced on 12 March 2012.

8.3.2 For air quality monitoring, no Action/Limit Level exceedance of 1-hour TSP results was recorded in the reporting quarter. However, one (1) 24-hour TSP results exceeded the Action Level at monitoring station AMS7, three (3) 24-hour TSP results exceeded the Action Level at monitoring station AMS3A and two (2) 24-hour TSP result exceeded the Limit Level at monitoring station AMS3A. The investigation results showed that the action and limit level exceedances were non-project related.

8.3.3 For noise monitoring, due to one documented complaint is received; one (1) Action Level Exceedance of construction noise was recorded in the reporting quarter. The investigation results show that the action level exceedance was non-project related. No Limit Level Exceedance of construction noise was recorded in the reporting quarter.

8.3.4 For impact water quality monitoring, ten (10) Action Level exceedances were recorded at measured suspended solids (SS) values (in mg/L) in the reporting quarter, one (1) Limit Level exceedance was recorded at measured suspended solids (SS) values (in mg/L) in the reporting quarter and 1 Action Level exceedance was recorded at turbidity (NTU) in the reporting quarter. Investigation result show that the exceedances were not due to the Project works.

8.3.5 One (1) Limit level exceedance was recorded in the reporting quarter. The investigation results showed that there is no evidence that exceedances are related to Project works are annexed in Appendix L. Actions were taken according to the Event and Action Plan for impact dolphin monitoring. Please refer to Appendix L for details of action taken.

8.3.6 Environmental site inspection was carried out thirteen times in the reporting quarter. Recommendations on remedial actions were given to the Contractors for the deficiencies identified during the site audits.

8.3.7 Four (4) environmental complaints were received in the reporting quarter.

8.3.8 One (1) notification of summons was received in the reporting quarter.

8.3.9 No successful prosecution was received in the reporting quarter.

8.3.10 Apart from the above mentioned monitoring, most of the recommended mitigation measures, as included in the EM&A programme, were implemented properly in the reporting quarter.

8.3.11 The recommended environmental mitigation measures effectively minimize the potential environmental impacts from the Project. The EM&A programme effectively monitored the environmental impacts from the construction activities and ensure the proper implementation of mitigation measures. No particular recommendation was advised for the improvement of the programme.

8.3.12 Moreover, regular review and checking on the construction methodologies, working processes and plants were carried out to ensure the environmental impacts were kept minimal and recommended environmental mitigation measures were implemented effectively.

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825000 N 824000 N 823000 N 822000 N 821000 N 820000 N 819000 N 818000 N 817000 N 816000 N 815000 N

N

THE SITE

PROPOSED HONG KONG BOUNDARY CROSSING FACILITIES

HONG KONG INTERNATIONAL AIRPORT

SIU HO WAN WIND PROFILER

SIU HO WAN ANEMOMETER STATION

WORKS AREA WA4

WORKS AREA WA3

WORKS AREA WA2

TUNG CHUNG

THE BROTHERS

TO KAU WAN

SIU HO WAN

PENG CHAU

HONG KONG INTERNATIONAL AIRPORT

HKBCF

HONG KONG DISNEYLAND

TUNG CHUNG

KEY PLAN

NOTES

1. ALL COORDINATES ARE RELATED TO HONG KONG 1980 GRID.
2. ALL LEVELS ARE IN METRES ABOVE HONG KONG PRINCIPAL DATUM (mPD).
3. REFER TO DRG NO. 211036/SL/1002 FOR THE DEFINITION OF SETTING OUT LINE (SOL) FOR THE HONG KONG BOUNDARY CROSSING FACILITIES (HKBCF) RECLAMATION SITE.
4. REFER TO DRG NO. 211036/SL/1004 FOR DETAILS OF SITE BOUNDARY.
5. FOR EXTENT OF SORTING FACILITIES AT FILL BANK AT TSEUNG KWAN O AREA 137 REFER TO DRG NO. 211036/SL/1015.

LEGEND

SITE BOUNDARY

SETTING OUT LINE (SOL)

WORKS AREA BOUNDARY

Rev	Description	By	Date
-	FOR CONSTRUCTION	HYJL	11/11

Consultant

ARUP 奧雅納工程顧問 Ove Arup & Partners Hong Kong Limited

Supported By :
- Ecosystems Ltd.
- EDA Marine Ltd.
- Geotechnical Consulting Group (Asia) Ltd.
- Hong Kong Cetacean Research Project
- InteliBuild Technyx Asia Limited
- Tony Gee and Partners LLP

Contract No. and Title:

Contract No. HY/2010/02
Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities
- Reclamation Works

Drawing title

KEY PLAN

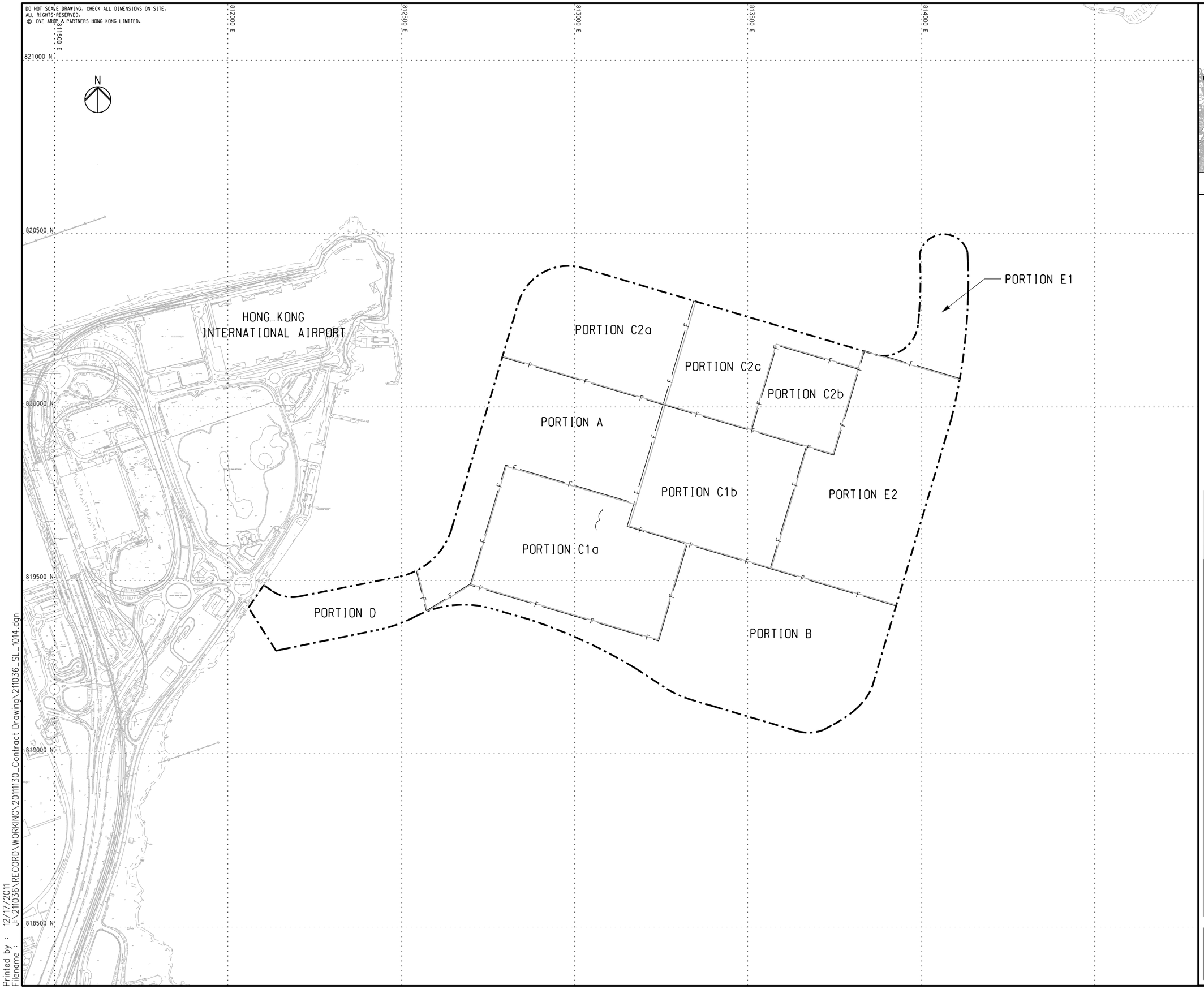
Drawing no. 211036/SL/1001 Rev. -

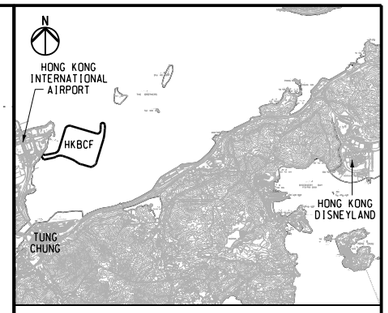
Drawn	Date	Checked	Approved
RL	11/09	KKY	DML

Scale 1:20000 @A1 1:40000 @A3 Status WORKING

路政署 HIGHWAYS DEPARTMENT
港珠澳大橋香港工程管理處 Hong Kong - Zhuhai - Macao Bridge Hong Kong Project Management Office

Printed by : 12/17/2011
Filename : J:\211036\RECORD\WORKING\20111130_Contract Drawing\211036_SL_1001.dgn





KEY PLAN

NOTES

1. FOR LEGENDS AND NOTES FOR CHAIN LINK FENCE AND GATE REFER TO DRG NO. 211036/SL/1013.
2. THE ERECTION OF CHAIN LINK FENCE AND GATES SHALL BE COMPLETED BY THE HANDOVER DATE OF EACH PORTION OF SITE, OR AS INSTRUCTED BY THE ENGINEER.
3. FOR SETTING OUT COORDINATES OF DIFFERENT PORTIONS OF SITE REFER TO DRG NO. 211036/SL/1003.
4. ACCESS POINTS BETWEEN PORTIONS SHALL BE PROVIDED BY THE CONTRACTOR. AND THE LOCATIONS SHALL BE AGREED WITH THE ENGINEER ON SITE.
5. FOR HOARDING AND FENCE AT FILL BANK AT TSEUNG KWAN O AREA 137 REFER TO DRG NO. 211036/SL/1015.

LEGEND

- SETTING OUT LINE (SOL)
- WORKS AREA BOUNDARY
- PORTIONS BOUNDARY LINE

Rev	Description	By	Date
-	FOR CONSTRUCTION	HYJL	11/11

Consultant

ARUP 奧雅納工程顧問 Ove Arup & Partners Hong Kong Limited

Supported By :
- Ecosystems Ltd.
- EDA Marine Ltd.
- Geotechnical Consulting Group (Asia) Ltd.
- Hong Kong Cetacean Research Project
- InteliBuild Technyx Asia Limited
- Tony Gee and Partners LLP

Contract No. and Title:
Contract No. HY/2010/02
Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities
- Reclamation Works

Drawing title
WORKS AREA LAYOUT
AND HORADING PLAN
(SHEET 2 OF 3)

Drawing no.	Rev.
211036/SL/1014	-

Drawn	Date	Checked	Approved
RL	06/10	KKY	DML

Scale 1:5000 @A1 1:10000 @A3
Status WORKING

路政署 HIGHWAYS DEPARTMENT
港珠澳大橋香港工程管理處
Hong Kong - Zhuhai - Macao Bridge
Hong Kong Project Management Office

Printed by : 12/17/2011
Filename : J:\211036\RECORD\WORKING\20111130_Contract Drawing\211036_SL_1014.dgn

ISO A3 297mm x 420mm

Checked:

Project Management Initials:

809000 E
810000 E
811000 E
812000 E
813000 E
814000 E
815000 E

820000 N
819000 N
818000 N
817000 N
816000 N

PROPOSED HONG KONG BOUNDARY CROSSING FACILITIES

AMS7

AMS6

AMS3A
NMS3A

AMS2
NMS2

CHEK LAP KOK

HONG KONG INTERNATIONAL AIRPORT

SCENIC HILL

Pak Sha Tsui

TUNG CHUNG

LEGEND

AMS1 AIR MONITORING STATIONS

NMS1 NOISE MONITORING STATIONS

WIND STATION

AECOM

Figure 2

IMPACT AIR QUALITY AND NOISE
MONITORING STATIONS AND WIND STATION

HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS

Project No.: 60249820 Date: MAY 2012

Plot File by: Lammd 03/05/2012
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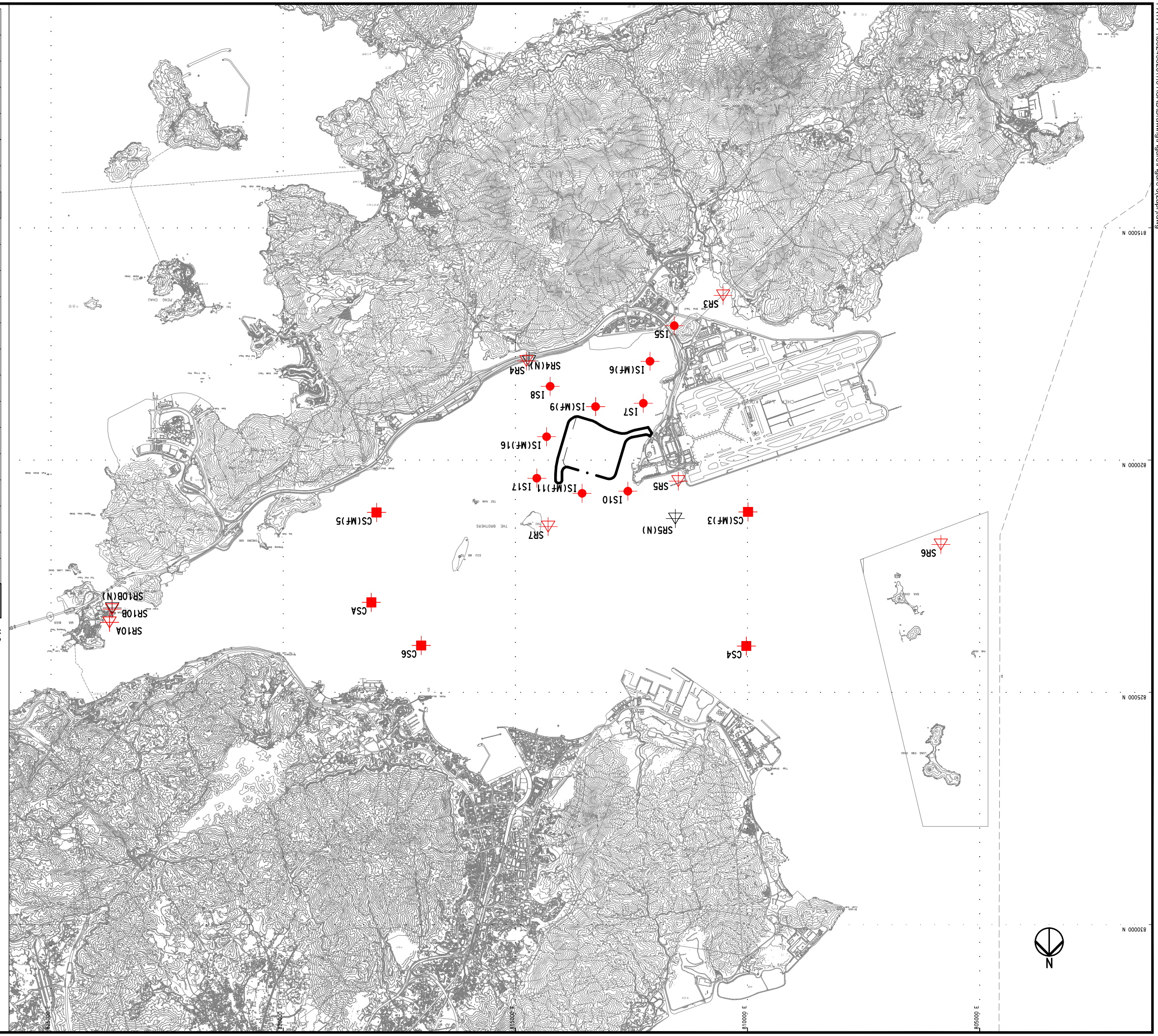
Plot File by: LAMMCL
PATH P:\60249820\1.01\CAD\Drawing\Figure\Figure 3(2apr).dwg
13/04/2012

Project Management Initials:

Checked:

ISO A3 297mm x 420mm



MONITORING STATIONS	CO-ORDINATES	
	EASTING	NORTHING
IS5	811579	817106
IS(MF)6	812101	817873
IS7	812244	818777
IS8	814251	818412
IS(MF)9	813273	818850
IS10	812577	820670
IS(MF)11	813562	820716
IS(MF)16	814328	819497
IS17	814539	820391
SR3	810525	816456
SR4(N)	814705	817859
SR5	811489	820455
SR5(N)	811555	821258
SR6	805837	821818
SR7	814293	821431
SR10A	823741	823495
SR10B(N)	823683	823187
CS(MF)3	809989	821117
CS(MF)5	817990	821129
CS4	810025	824004
CS6	817028	823992
CSA	818103	823064

SETTING OUT SCHEDULE

LEGEND

IS — IMPACT STATIONS

CS — CONTROL / FAR FIELD STATIONS

SR — SENSITIVE RECEIVERS STATIONS

SR — SENSITIVE RECEIVERS STATIONS (RELOCATED)

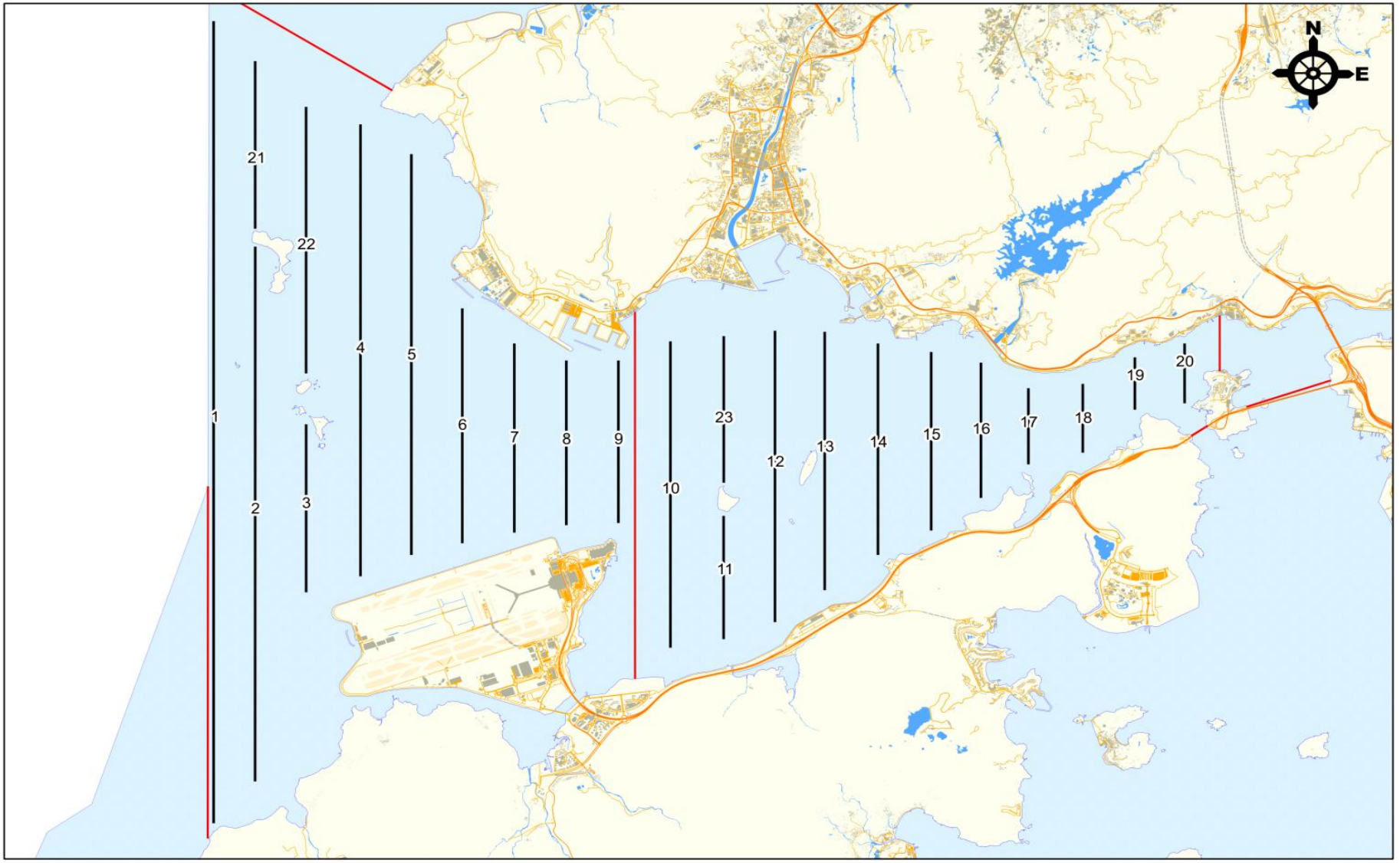
HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS

Project No.: 60249820 Date: APR 2012

IMPACT WATER QUALITY MONITORING STATIONS

AECOM

Figure 3



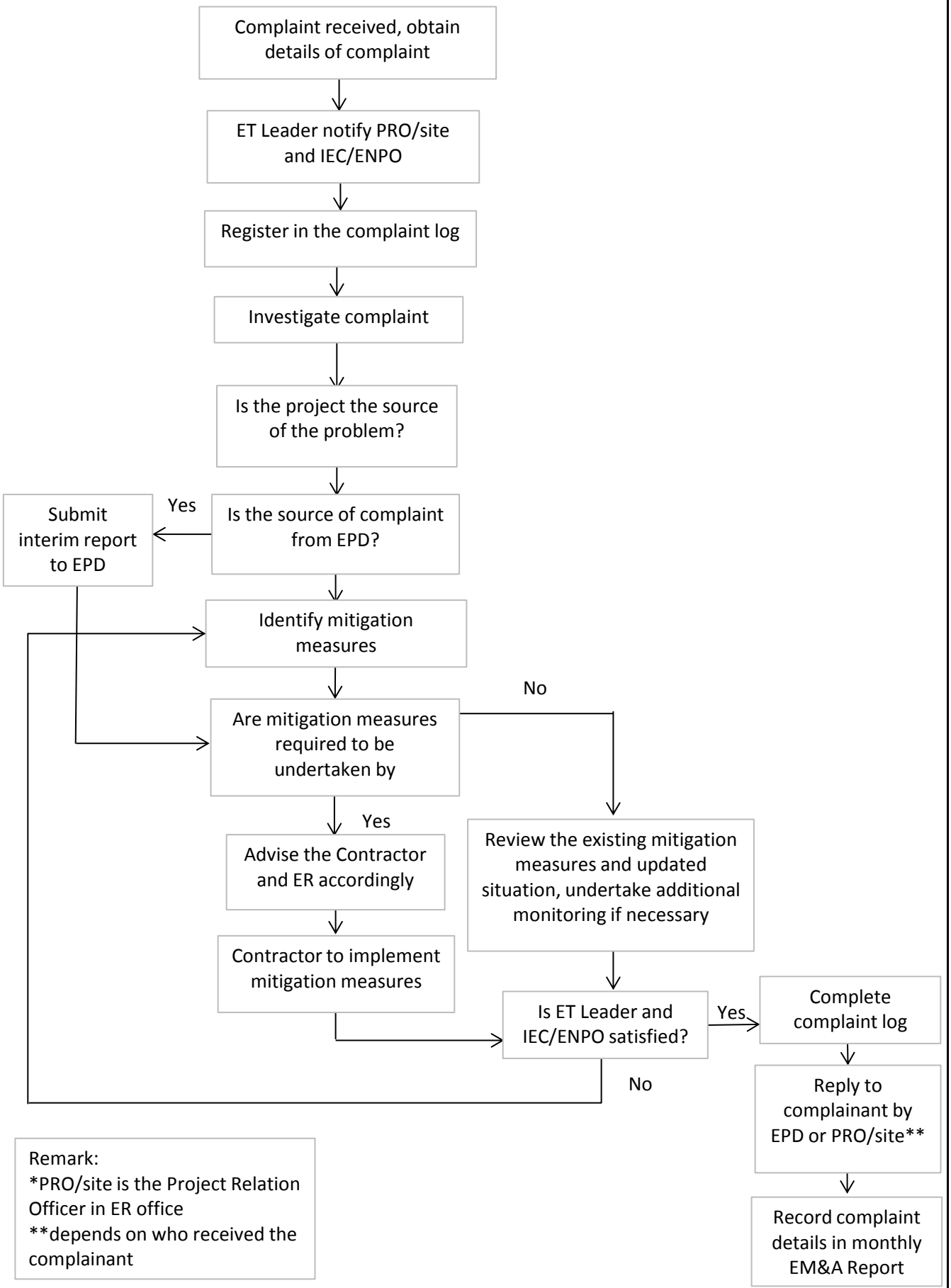
***Remark: Transect 10 is now 3.6km in length due to the HKBCF construction site. The total transect length for both NEL and NWL combined is 111km.**

HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS
Project No.: 60249820 Date: January 13

Impact Dolphin Monitoring
Line Transect Layout Map

AECOM

Figure 4



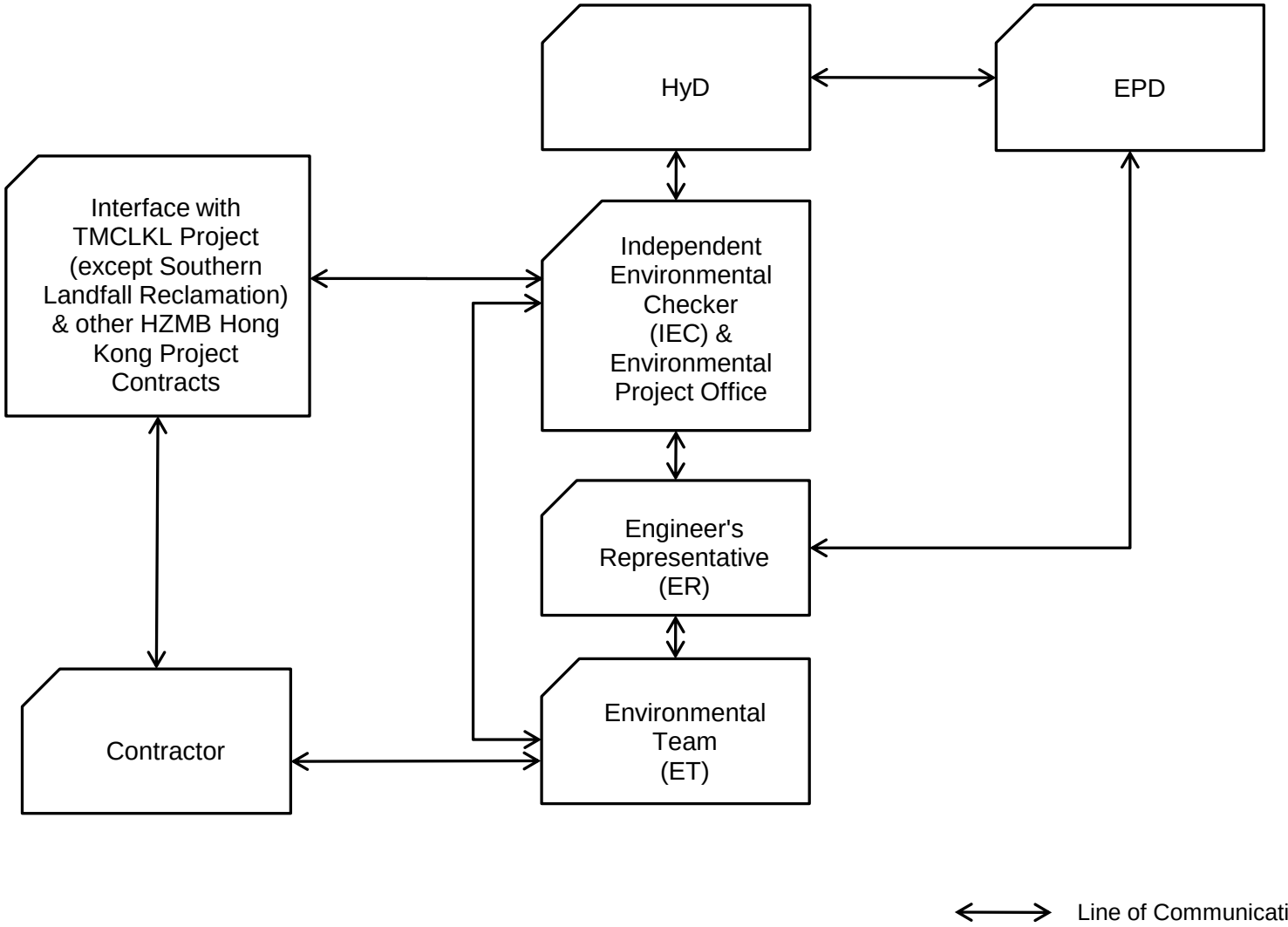
HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS

AECOM

Environmental Complaint Handling Procedure

Project No.: 60249820 **Date: July 2012**

Figure 5



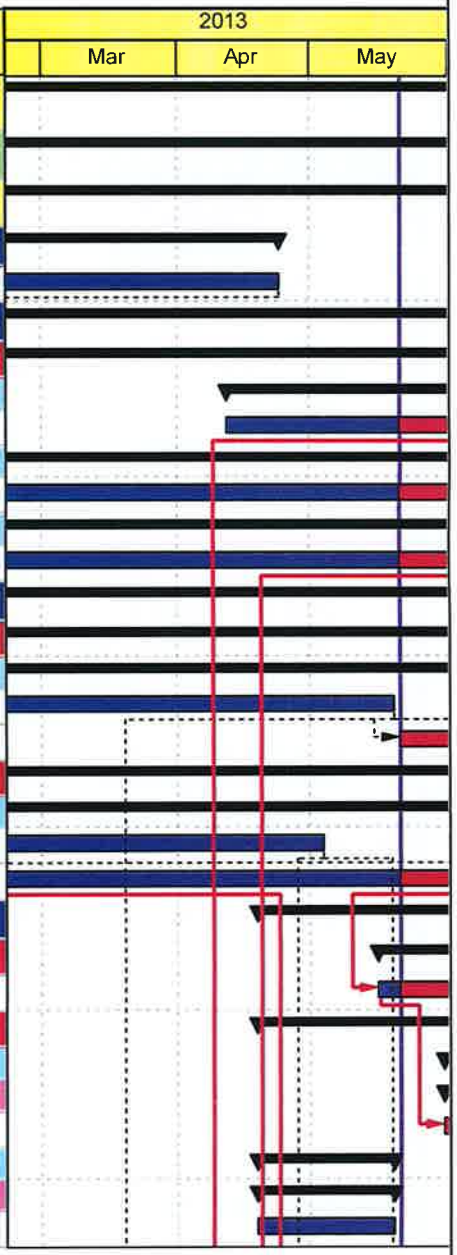
HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
--RECLAMATION WORKS
Project No.: 60249820 Date: April 2013

Project Organisation for Environmental Works

AECOM

Appendix A

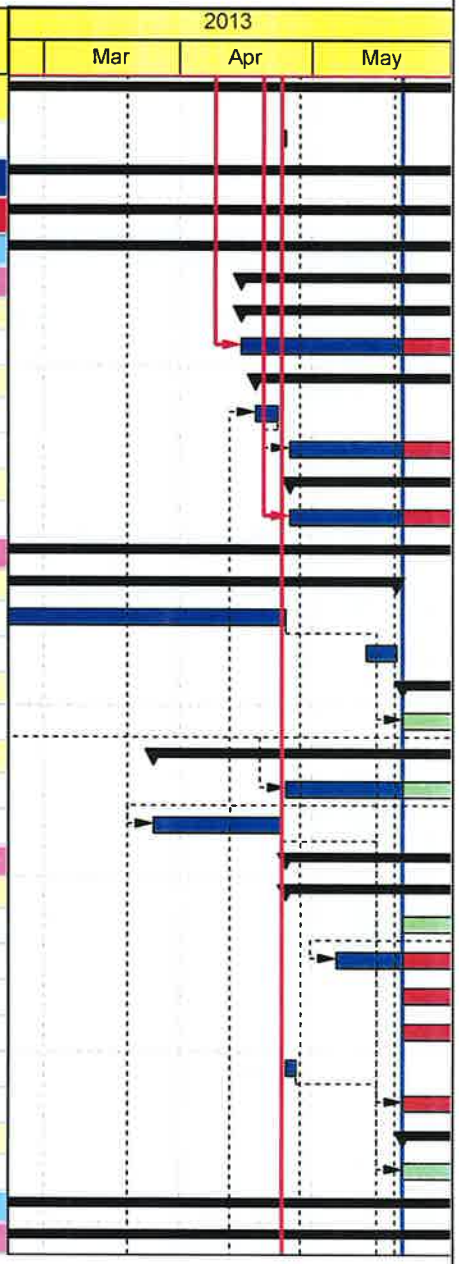
Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
18th Monthly Progress Report status as of 21 May 2013		1918	1397	30-Nov-11 A	17-Mar-17
Work Zone, as defined in PS Clause 1.03(6)		561	1397	02-May-12 A	17-Mar-17
Portion A		164	39	09-Jan-13 A	28-Jun-13
Variation of Environmental Permit - Sand Blanket laying in all portions		30	0	01-Feb-13 A	24-Apr-13
VEP-10030	VEP Approval by EPD	30	0	01-Feb-13 A	24-Apr-13
Ground Treatment		152	28	05-Feb-13 A	19-Jun-13
Stone Columns C118 - C134 6,399Nos.		152	28	05-Feb-13 A	19-Jun-13
Portion A C118 - C121 4Cells 1,460Nos.		81	28	12-Apr-13 A	19-Jun-13
SC0A-1020	Stone Columns PA C118 - C121 4cells 1,210nrs/1460nrs FTB17 after removal of C120	81	28	12-Apr-13 A	19-Jun-13
Portion A C122 - C124 3Cells 1,075Nos.		56	12	05-Feb-13 A	01-Jun-13
SC0A-2010	Stone Columns PA C122 - C124 3cells 837nrs/1075nrs (15nrs/day) FTB-AP3	56	12	05-Feb-13 A	01-Jun-13
Portion A C132 - C134 3Cells 1,167Nos		59	13	05-Feb-13 A	03-Jun-13
SC0A-5010	Stone Columns PA C132 - C134 3cells 879nrs/1167nrs (15nrs/day) FTB-AP4	59	13	05-Feb-13 A	03-Jun-13
Reclamation		108	16	09-Jan-13 A	05-Jun-13
Portion A Geotextile		97	15	09-Jan-13 A	05-Jun-13
Land Portion A		97	15	09-Jan-13 A	05-Jun-13
GERA0-010	Geotextile 285,000m2 for sand blanket PA Main Area C118 to C126 10,000m2/day	26	0	09-Jan-13 A	20-May-1
GERA0-020	Geotextile 142,500m2 for sand blanket PA Edge Area C118 to C126 10,000m2/day	15	15	21-May-13	05-Jun-13
Portion A Sand Blanket		100	12	31-Jan-13 A	01-Jun-13
Land Portion A		100	12	31-Jan-13 A	01-Jun-13
SABRA0-005	Sand Blankets 200,000m3 PA Main Area C118 to C119 10,000m3/day	20	0	31-Jan-13 A	04-May-1
SABRA0-010	Sand Blankets 357,500m3 PA Main Area C120 to C126 10,000m3/day	36	12	18-Feb-13 A	01-Jun-13
Portion A		74	39	19-Apr-13 A	28-Jun-13
Temporary Bund		60	30	16-May-13 A	21-Jun-13
PA6-TB0090	Construction of Temporary Seawall	60	30	16-May-13 A	21-Jun-13
Reclamation		39	29	19-Apr-13 A	28-Jun-13
Portion A Marine Fill upto +2.5mPD		27	27	31-May-13	28-Jun-13
Land Portion A		27	27	31-May-13	28-Jun-13
PA6-MFA0-(	Marine Fill Type A Sand 100% at PA Main Area at C118 - C121 530,010m3 20,000m3/day	27	27	31-May-13	28-Jun-13
Portion A Land Band Drain		17	0	19-Apr-13 A	20-May-1
Land Portion A		17	0	19-Apr-13 A	20-May-1
PA6-VBDA0	Vertical Band Drains by Marine plant at PA C118 - C126 Main Area [8904]	17	0	19-Apr-13 A	20-May-1



Remaining Level of Effort
Actual Level of Effort
Actual Work
Remaining Work

TASK filters: Last Three Month Programme, Work Programme.

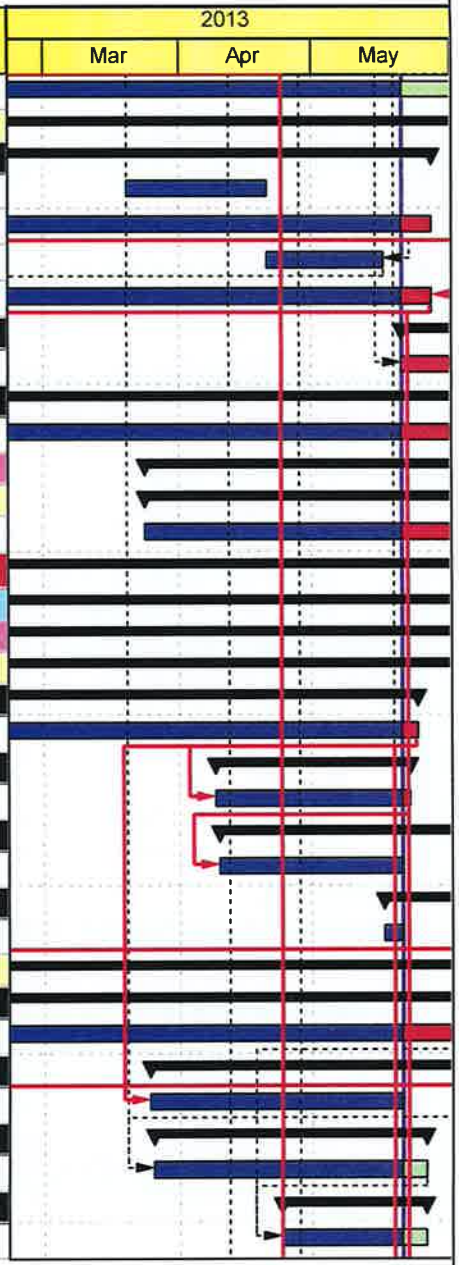
Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
Portion B, C & E		561	1397	02-May-12 A	17-Mar-17
VBDC2c-010a	Vertical Band Drains 480 nrs by marine plant at Portion C2c	2	0	24-Apr-13 A	25-Apr-13
Portion B, C & E		561	1397	02-May-12 A	17-Mar-17
Seawall		556	120	02-May-12 A	17-Sep-13
Ground Treatment		228	109	05-Feb-13 A	14-Sep-13
Stone Columns for Sloping Seawall by Marine Plant		182	109	15-Apr-13 A	14-Sep-13
Portion C2a C113 - C117 5Cells 2,164Nos FTB17		48	42	15-Apr-13 A	04-Jul-13
SC0A-5020	Stone Columns PC2a C113 - C117 5cells 952nrs/2164nrs (15nrs/day) FTB17	48	42	15-Apr-13 A	04-Jul-13
Portion B K13 - K17 4Cells 2,052Nos. AP1		159	103	18-Apr-13 A	08-Sep-13
SC0B-0010	Modification of stone column barge FTB-AP2	7	0	18-Apr-13 A	23-Apr-13
SC0B-1000	Stone Columns PB K013 - K017 5Cells 1,855 / 2,052Nos FTB-AP2	137	103	26-Apr-13 A	08-Sep-13
Portion B K18 - K23 7Cells 2,146Nos. AP4		143	109	26-Apr-13 A	14-Sep-13
SC0B-2000	Stone Columns PB K018 - K023 6Cells 1,949 / 2,146Nos FTB-AP2	143	109	26-Apr-13 A	14-Sep-13
Stone Columns Inside cellular structures by Marine Plant		217	54	05-Feb-13 A	17-Jul-13
Seawall Portion C2a at C103 - C112 10cells 990nrs		75	0	05-Feb-13 A	20-May-1
SCIC-020	Stone Columns insdie cells & 2rows 2cells 412nrs/990nrs (15nrs/day) FTB18	28	0	05-Feb-13 A	25-Apr-13
SCIE2-010a	Stone Columns inside cells & 2rows 2 cells 103 / 640nrs (15nrs/day) FTB18	7	0	13-May-13 A	20-May-1
Seawall Portion E2 at C060 - C067 8cells @80nrs/cell 640nrs		36	36	21-May-13	27-Jun-13
SCIE2-010	Stone Columns inside cells & 2rows 8cells 537/ 640nrs (15nrs/day) FTB18	36	36	21-May-13	27-Jun-13
Seawall Portion E1 at C068 - C091 24cells @80nrs/cell 1,920nrs		106	54	26-Mar-13 A	17-Jul-13
SCIE1-010	Stone Columns inside cells & 2rows 16cells 1,280nrs (15nrs/day) C091 - C076 FTB18	86	54	25-Apr-13 A	17-Jul-13
SCIE1-020	Stone Columns inside cells & 2rows 8cells 640nrs (15nrs/day) C068 - C075 FTB18 & FTB17	43	0	26-Mar-13 A	24-Apr-13
Stone Columns Outside cellular Structures by Marine Plant		118	91	25-Apr-13 A	26-Aug-13
Seawall Portion B at K024 - K051 28cells 5,729nrs		118	89	25-Apr-13 A	23-Aug-13
SCOB-A005	Modifcation of stone columns barge FTB16	17	17	21-May-13	07-Jun-13
SCOB-A010	Stone Columns outermost K024 - K032 9cells 779 / 921nrs (15nrs/day) FTB16 (62+12=74days)	74	52	06-May-13 A	15-Jul-13
SCOB-A020	Stone Columns outermost K033 - K045 13cells 1,330nrs (15nrs/day) FTB19	89	89	21-May-13	23-Aug-13
SCOB-A030	Setup Gravel pump system FTB20 stone column barge	21	21	21-May-13	11-Jun-13
SCOB-B020	Modification of stone columns barge FTB-AP1	7	0	25-Apr-13 A	27-Apr-13
SCOB-B030	Stone Columns beside K041 - K051 11cells 1,125nrs (15nrs/day) FTB-AP1	75	75	21-May-13	08-Aug-13
Seawall Portion E1 at C068 - C090 23cells 6,841nrs		91	91	21-May-13	26-Aug-13
SCOE1-A0	Stone Columns outermost C070 - C074 5cells 1,368nrs (15nrs/day) FTB18	91	91	21-May-13	26-Aug-13
Cellular Structures		514	120	02-May-12 A	17-Sep-13
Cellular Main Cells 89cells		514	120	02-May-12 A	17-Sep-13



Remaining Level of Effort | Actual Work
Actual Level of Effort | Remaining Work

TASK filters: Last Three Month Programme, Work Programme.

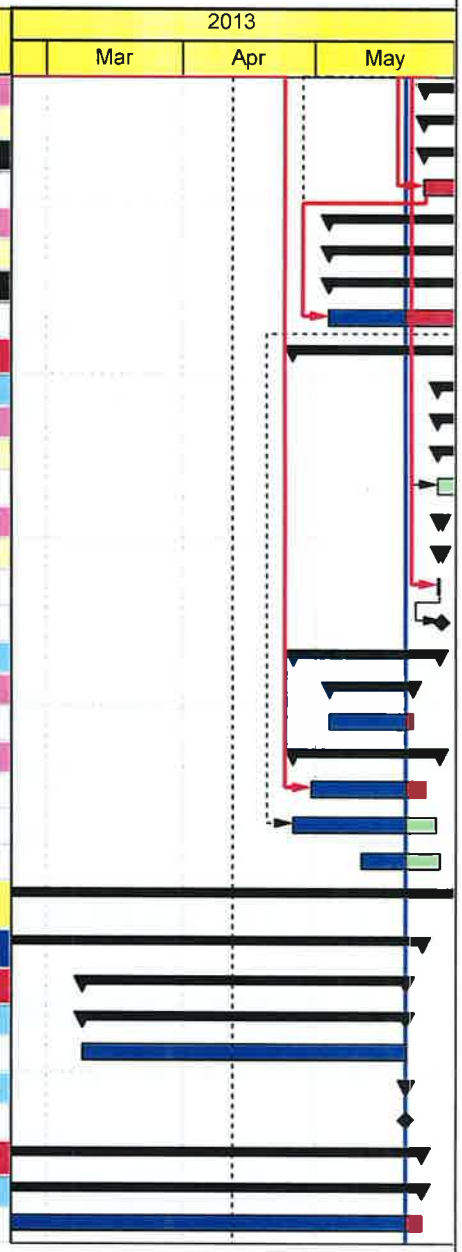
Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
CS10000	Production of Y Junction for Cellular Walls Construction	504	120	02-May-12 A	17-Sep-13
Full Guide Frames Method 89cells		388	74	13-Aug-12 A	02-Aug-13
Portion B K024 to K051 28cells		323	7	23-Oct-12 A	27-May-13
CS040-000	Portion B Cellular Structure K040	21	0	20-Mar-13 A	21-Apr-13
CSB00-010	Portion B Modification of guide frame for Cellular structures	36	7	18-Jan-13 A	27-May-13
CSB00-10	Portion B Cellular Structure (K24,K25,K26,K27), K29 & K32 6cells	45	0	21-Apr-13 A	17-May-1
CSB00-990	Portion B Cellular Structure K43,K44,K47,K48,K50 & K51 6cells type_C 27,045m3	45	7	23-Oct-12 A	27-May-13
Portion C2a C112 to C103 10cells		69	69	21-May-13	02-Aug-13
CSC2a-000	Portion C2a Cellular Structure C112 to C103 10cells Type_C 63,322m3	69	69	21-May-13	02-Aug-13
Portion E2 K052 to C067 16cells		69	27	13-Aug-12 A	18-Jun-13
CS00E2-0	Portion E2 Cellular Structure K052 to C063 10cells (except K055 & K056) Type_C 69,540m3	69	27	13-Aug-12 A	18-Jun-13
Connecting Arcs		54	36	24-Mar-13 A	27-Jun-13
Portion B between K024 to K051 27arcs		54	36	24-Mar-13 A	27-Jun-13
CA00B-000	Portion B Connecting Arc structure 1st install K038 & other 2arcs	54	36	24-Mar-13 A	27-Jun-13
Reclamation		173	1397	16-Jan-13 A	17-Mar-17
Ground Treatment		173	1397	16-Jan-13 A	17-Mar-17
Geotextile		153	1291	16-Jan-13 A	17-Mar-17
Existing Seabed Below -5mPD		120	153	16-Jan-13 A	01-Nov-13
Land Portion C2a		5	4	16-Jan-13 A	24-May-13
GERC2a-	Geotextile for sand blanket at Portion C2a	5	4	16-Jan-13 A	24-May-13
Land Portion C2c		5	2	09-Apr-13 A	22-May-13
GERC2c-	Geotextile for sand blanket at Portion C2c	5	2	09-Apr-13 A	22-May-13
Land Portion C2b		5	4	10-Apr-13 A	14-Aug-13
GERC2b-	Geotextile for sand blanket at Portion C2b	5	4	10-Apr-13 A	14-Aug-13
Land Portion E1		3	2	17-May-13 A	01-Nov-13
GERE1-0	Geotextile for sand blanket at Portion E1	3	2	17-May-13 A	01-Nov-13
Existing Seabed above -5mPD		148	1291	25-Jan-13 A	17-Mar-17
Land Portion B		25	14	25-Jan-13 A	04-Jun-13
GERB0-0	Geotextile for sand blanket at Portion B K041 - K051	25	14	25-Jan-13 A	04-Jun-13
Land Portion C1a		21	13	25-Mar-13 A	17-Mar-17
GERC1a-	Geotextile for sand blanket at Portion C1a 199,200m3	21	13	25-Mar-13 A	17-Mar-17
Land Portion C1b		15	6	26-Mar-13 A	26-May-13
GERC1b-	Geotextile for sand blanket at Portion C1b 145,000m3	15	6	26-Mar-13 A	26-May-13
Land Portion E2 Southern Part		8	6	24-Apr-13 A	26-May-13
GERE2-0	Geotextile for sand blanket at Portion E2 Southern (seabed above -5mPD)	8	6	24-Apr-13 A	26-May-13



Remaining Level of Effort
Actual Work
Actual Level of Effort
Remaining Work

TASK filters: Last Three Month Programme, Work Programme.

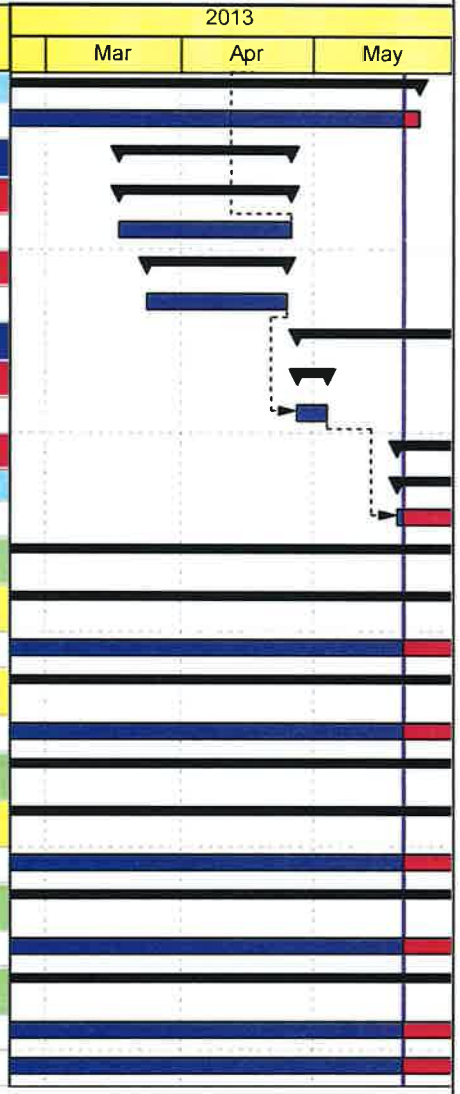
Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
Sand Blankets		37	37	25-May-13	03-Jul-13
Existing Seabed below -5mPD		37	37	25-May-13	03-Jul-13
Land Portion C2a		37	37	25-May-13	03-Jul-13
SABRC2a	Sand Blankets at Portion C2a 73,000m3 2,000m3/day	37	37	25-May-13	03-Jul-13
Vertical Band Drains		68	66	04-May-13 A	30-Jul-13
Vertical Band Drains by Marine Plant		68	66	04-May-13 A	30-Jul-13
Land Portion C2a		68	66	04-May-13 A	30-Jul-13
VBDC2a-(	Vertical Band Drains 97,288nrs by marine plant at Portion C2a	68	66	04-May-13 A	30-Jul-13
Geotechnical Instrumentation Works		161	18	26-Apr-13 A	07-Jun-13
Geotechnical Instrumentation Works for Seawalls		11	11	28-May-13	07-Jun-13
Cluster Type SA 2nrs Piezometer, Extensometer and Settlement Marker Cluster inside Cells		10	10	28-May-13	07-Jun-13
SA-1 K048 Portion B		10	10	28-May-13	07-Jun-13
CTSA1-010	Installation of SA-1 C048 (within 10days after filling C048) Portion B	10	10	28-May-13	07-Jun-13
Cluster Type SC 3nrs Strain Guage and Inclinometer Cluster inside cells		1	1	28-May-13	29-May-13
SC-1 K044 Portion B		1	1	28-May-13	29-May-13
CTSC1-010	Installation of SC-1 K044 Portion B	1	1	28-May-13	28-May-13
CTSC1-020	Commencement of Monitoring of SC-1 K044 Portion B	0	0	29-May-13	
Geotechnical Instrumentation Works for Reclamation RA & RB		134	7	26-Apr-13 A	28-May-13
RA		7	2	04-May-13 A	22-May-13
CTRA-010	Installation of RA 5sets at Portion A	7	2	04-May-13 A	22-May-13
RB		134	7	26-Apr-13 A	28-May-13
SMT1-010	Installation of at Portion A	7	5	30-Apr-13 A	25-May-13
SMT1-070	Installation of at Portion C2a	7	6	26-Apr-13 A	27-May-13
SMT1-090	Installation of at Portion C2c	7	7	11-May-13 A	28-May-13
Portion D		203	18	11-Dec-12 A	07-Jun-13
Submission		161	4	11-Dec-12 A	24-May-13
Design Submission		73	0	09-Mar-13 A	21-May-13
Settlement Assessment for Reclamation Areas at Portion D		1	0	09-Mar-13 A	21-May-13
PD-DGN-13(	Settlement Assessment for Reclamation Area at Portion D comments [CGS/000192]	1	0	09-Mar-13 A	21-May-13
Settlement Assessment for Reclamation with land-based Drain		0	0	21-May-13	21-May-13
PD-DGN-01(	Settlement Assessment for Reclamation with Land based band drain	0	0		21-May-1
Method Statement Submission		45	4	11-Dec-12 A	24-May-13
Seawall		45	4	11-Dec-12 A	24-May-13
PD-MTD-010	MTD for Temporary Seawall Construction - Approval	45	4	11-Dec-12 A	24-May-13



Remaining Level of Effort | Actual Work
Actual Level of Effort | Remaining Work

TASK filters: Last Three Month Programme, Work Programme.

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
	Float & Sink installation of Culvert C1 - C4	45	4	11-Dec-12 A	24-May-13
PD-MTD-070	MTD for Float & Sink of culvert C1 - C4 - Approval	45	4	11-Dec-12 A	24-May-13
	Stone Columns by Marine Plant	30	0	18-Mar-13 A	26-Apr-13
	Stone Columns in Zone C 2,456nrs	22	0	18-Mar-13 A	26-Apr-13
A1580-50	PD Zone C Upper Stone Columns 326nrs/606nrs (15nrs/day) FTB-AP2 (subject to revise height lim	22	0	18-Mar-13 A	26-Apr-13
	Stone Columns at Box Culverts	8	0	24-Mar-13 A	25-Apr-13
A1604-32	PD C1 Culvert Stone Columns 118nrs/217nrs (15nrs/day) FTB16	8	0	24-Mar-13 A	25-Apr-13
	Construction	42	18	27-Apr-13 A	07-Jun-13
	Ground Investigation	42	0	27-Apr-13 A	04-May-1
A1600	VO.009 Additional Ground Investigation 6nos in Portion D	42	0	27-Apr-13 A	04-May-1
	Seawall Construction	20	17	20-May-13 A	07-Jun-13
	North Portion (North CH 5700 - 6136)	20	17	20-May-13 A	07-Jun-13
SI1-SW-A15	Stone Blankets & Geotextile Type 1 for Seawall at West Portion D	20	17	20-May-13 A	07-Jun-13
	Works Area WA2 (Tung Chung)	1570	1135	30-Nov-11 A	28-Feb-17
	Zone A	1434	1135	21-May-12 A	28-Feb-17
A1880	Maintenance of Engineer's Accommodation	1434	1135	21-May-12 A	28-Feb-17
	Zone B	615	180	30-Nov-11 A	20-Dec-13
A3090	Maintenance of Site	615	180	30-Nov-11 A	20-Dec-13
	Works Area WA3 (Siu Ho Wan STW)	1467	1135	08-Apr-12 A	28-Feb-17
	Zone A	1467	1135	08-Apr-12 A	28-Feb-17
WA3-1020	Maintenance of Accomodation for Public Works Region Laboratory	1467	1135	08-Apr-12 A	28-Feb-17
	Works Area WA4 (To Kau Wan)	548	180	23-Feb-12 A	20-Dec-13
A1910	Maintenance of Site Zone A	548	180	23-Feb-12 A	20-Dec-13
	Works Area TKO Fill Bank	1254	1062	25-Sep-12 A	30-Nov-16
WA-TKO-1040	Operate and Maintain Public Fill Sorting Facilities in Zone A, B1 & B2	1254	1062	25-Sep-12 A	30-Nov-16
WA-TKO-1050	Maintainance of Site in Zone C	570	378	25-Sep-12 A	22-Aug-14



Remaining Level of Effort
Actual Work
Actual Level of Effort
Remaining Work

TASK filters: Last Three Month Programme, Work Programme.

Appendix C - Implementation Schedule of Environmental Mitigation Measures

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
Air Quality				
S5.5.6.1 of HKBCFEIA	A1	The contractor shall follow the procedures and requirements given in the Air Pollution Control (Construction Dust) Regulation	All construction sites	V
S5.5.6.2 of HKBCFEIA and S4.8.1 of TKCLKLEIA	A2	Proper watering of exposed spoil should be undertaken throughout the construction phase: • Any excavated or stockpile of dusty material should be covered entirely by impervious sheeting or sprayed with water to maintain the entire surface wet and then removed or backfilled or reinstated where practicable within 24 hours of the excavation or unloading; • Any dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads; • A stockpile of dusty material should not be extend beyond the pedestrian barriers, fencing or traffic cones. • Where practicable, vehicle washing facilities with high pressure water jet should be provided at every discernible or designated vehicle exit point. The area where vehicle washing takes place and the road section between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores; • When there are open excavation and reinstatement works, hoarding of not less	All construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		than 2.4m high should be provided as far as practicable along the site boundary with provision for public crossing. Good site practice shall also be adopted by the Contractor to ensure the conditions of the hoardings are properly maintained throughout the construction period; • The portion of any road leading only to construction site that is within 30m of a vehicle entrance or exit should be kept clear of dusty materials; • Surfaces where any pneumatic or power-driven drilling, cutting, polishing or other mechanical breaking operation takes place should be sprayed with water or a dust suppression chemical continuously; • Any area that involves demolition activities should be sprayed with water or a dust suppression chemical immediately prior to, during and immediately after the activities so as to maintain the entire surface wet; • Where a scaffolding is erected around the perimeter of a building under construction, effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building, or a canopy should be provided from the first floor level up to the highest level of the scaffolding; • Any skip hoist for material transport should be totally enclosed by impervious sheeting; • Every stock of more than 20 bags of cement or dry pulverised fuel ash (PFA) should be covered entirely by impervious sheeting or placed in an area sheltered		

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		on the top and the 3 sides; • Cement or dry PFA delivered in bulk should be stored in a closed silo fitted with an audible high level alarm which is interlocked with the material filling line and no overfilling is allowed; • All unpaved roads/exposed area shall be watered which results in dust suppression by forming moist cohesive films among the discrete grains of road surface material. • No burning of debris or other materials on the works areas is allowed; • Water spray shall be used during the handling of fill material at the site and at active cuts, excavation and fill sites where dust is likely to be created; • Open dropping heights for excavated materials shall be controlled to a maximum height of 2m to minimise the fugitive dust arising from unloading; • During transportation by truck, materials shall not be loaded to a level higher than the side and tail boards, and shall be dampened or covered before transport. Materials having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be covered by a clean tarpaulin. The tarpaulin shall be properly secured and shall extend at least 300mm over the edges of the side and tail boards; • Loading, unloading, transfer, handling or storage of bulk cement or dry PFA should be carried out in a totally enclosed system or facility, and any vent or exhaust should be fitted with an effective fabric filter or equivalent air pollution control		

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		system; and • Exposed earth should be properly treated by compaction, turfing, hydroseeding, vegetation planting or sealing with latex, vinyl, bitumen, shotcrete or other suitable surface stabiliser within six months after the last construction activity on the construction site or part of the construction site where the exposed earth lies.		
S5.5.6.3 of HKBCFEIA and S4.8.1 of TKCLKLEIA	A3	The Contractor should undertake proper watering on all exposed spoil and associated work areas (with at least 8 times per day) throughout the construction phase.	All construction sites	V
S5.5.6.4 of HKBCFEIA and S4.11 of TKCLKLEIA	A4	Implement regular dust monitoring under EM&A programme during the construction stage.	Selected representative dust monitoring station	V
S5.5.7.1 of HKBCFEIA	A5	The following mitigation measures should be adopted to prevent fugitive dust emissions for concrete batching plant: • Loading, unloading, handling, transfer or storage of any dusty materials should be carried out in totally enclosed system; • All dust-laden air or waste gas generated by the process operations should be properly extracted and vented to fabric filtering system to meet the emission limits for TSP;	All construction sites	N/A

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		• Vents for all silos and cement/ pulverised fuel ash (PFA) weighing scale should be fitted with fabric filtering system; • The materials which may generate airborne dusty emissions should be wetted by water spray system; • All receiving hoppers should be enclosed on three sides up to 3m above unloading point; • All conveyor transfer points should be totally enclosed; • All access and route roads within the premises should be paved and wetted; and • Vehicle cleaning facilities should be provided and used by all concrete trucks before leaving the premises to wash off any dust on the wheels and/or body.		
S5.5.2.7 of HKBCFEIA	A6	The following mitigation measures should be adopted to prevent fugitive dust emissions at barging point: • All road surface within the barging facilities will be paved; • Dust enclosures will be provided for the loading ramp; • Vehicles will be required to pass through designated wheels wash facilities; and • Continuous water spray at the loading points.	All construction sites	N/A (Construction in process)
Construction Noise (Air borne)				
S6.4.10 of HKBCFEIA	N1	Use of good site practices to limit noise emissions by considering the following: • only well-maintained plant should be operated on-site and plant should be	All construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		serviced regularly during the construction programme; • machines and plant (such as trucks, cranes) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; • plant known to emit noise strongly in one direction, where possible, be orientated so that the noise is directed away from nearby NSRs; • silencers or mufflers on construction equipment should be properly fitted and maintained during the construction works; • mobile plant should be sited as far away from NSRs as possible and practicable; • material stockpiles, mobile container site officer and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.		
S6.4.11 of HKBCFEIA	N2	Install temporary hoarding located on the site boundaries between noisy construction activities and NSRs. The conditions of the hoardings shall be properly maintained throughout the construction period.	All construction sites	V
S6.4.12 of HKBCFEIA	N3	Install movable noise barriers (typically density @14kg/m^2), acoustic mat or full enclosure close to noisy plants including air compressor, generators, saw.	For plant items listed in Appendix 6D of the EIA report at all construction sites	N/A
S6.4.13 of HKBCFEIA	N4	Select “Quiet plants” which comply with the BS 5228 Part 1 or TM standards.	For plant items listed in Appendix 6D of the	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
			EIA report at all construction sites	
S6.4.14 of HKBCFEIA	N5	Sequencing operation of construction plants where practicable.	All construction sites where practicable	V
S5.1 of TMCLKLEIA	N6	Implement a noise monitoring under EM&A programme.	Selected representative noise monitoring station	V
Waste Management (Construction Waste)				
S12.6 of TMCLKLEIA	WM1	The Contractor shall identify a coordinator for the management of waste.	All construction sites	V
S12.6 of TMCLKLEIA	WM2	The Contractor shall apply for and obtain the appropriate licenses for the disposal of public fill, chemical waste and effluent discharges.	All construction sites	V
S12.6 of TMCLKLEIA	WM3	EM&A of waste handling, storage, transportation, disposal procedures and documentation through the site audit programme shall be undertaken.	All construction sites	V
S8.3.8 of HKBCFEIA and S12.6 of TMCLKLEIA	WM4	*Construction and Demolition Material* The following mitigation measures should be implemented in handling the waste: • Maintain temporary stockpiles and reuse excavated fill material for backfilling and reinstatement; • Carry out on-site sorting;	All construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		• Make provisions in the Contract documents to allow and promote the use of recycled aggregates where appropriate; • Adopt 'Selective Demolition' technique to demolish the existing structures and facilities with a view to recovering broken concrete effectively for recycling purpose, where possible; • Implement a trip-ticket system for each works contract to ensure that the disposal of C&D materials are properly documented and verified; • Implement an enhanced Waste Management Plan similar to ETWBTC (Works) No. 19/2005 – "Environmental Management on Construction Sites" to encourage on-site sorting of C&D materials and to minimize their generation during the course of construction; • In addition, disposal of the C&D materials onto any sensitive locations such as agricultural lands, etc. should be avoided. The Contractor shall propose the final disposal sites to the Project Proponent and get its approval before implementation; and • The surplus surcharge should be transferred to a fill bank.		
S8.3.9-S8.3.11 of HKBCFEIA and S12.6 of	WM5	*C&D Waste* • Standard formwork or pre-fabrication should be used as far as practicable in order to minimise the arising of C&D materials. The use of more durable formwork or plastic facing for the construction works should be considered. Use of wooden	All construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
TMCLKLEIA		hoardings should not be used, as in other projects. Metal hoarding and falsework should be used to enhance the possibility of recycling. The purchasing of construction materials will be carefully planned in order to avoid over ordering and wastage. • The Contractor should recycle as much of the C&D materials as possible on-site. Public fill and C&D waste should be segregated and stored in different containers or skips to enhance reuse or recycling of materials and their proper disposal. Where practicable, concrete and masonry can be crushed and used as fill. Steel reinforcement bar can be used by scrap steel mills. Different areas of the sites should be considered for such segregation and storage.		
S8.2.12-S8.3.15 of HKBCFEIA and S12.6 of TMCLKLEIA	WM6	*Chemical Waste* • Chemical waste that is produced, as defined by Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation, should be handled in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. • Containers used for the storage of chemical wastes should be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed; have a capacity of less than 450 liters unless the specification has been approved by the EPD; and display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the regulation. • The storage area for chemical wastes should be clearly labelled and used solely for	All construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		the storage of chemical waste; enclosed on at least 3 sides; have an impermeable floor and bunding of sufficient capacity to accommodate 110% of the volume of the largest container or 20 % of the total volume of waste stored in that area, whichever is the greatest; have adequate ventilation; covered to prevent rainfall entering; and arranged so that incompatible materials are adequately separated. • Disposal of chemical waste should be via a licensed waste collector; be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Centre which also offers a chemical waste collection service and can supply the necessary storage containers; or be to a reuser of the waste, under approval from the EPD.		
S8.3.16 of HKBCFEIA and S12.6 of TMCLKLEIA	WM7	*Sewage* • Adequate numbers of portable toilets should be provided for the workers. The portable toilets should be maintained in a state, which will not deter the workers from utilizing these portable toilets. Night soil should be collected by licensed collectors regularly.	All construction sites	V
S8.3.17 of HKBCFEIA and S12.6 of TMCLKLEIA	WM8	*General Refuse* • The site and surroundings shall be kept tidy and litter free. General refuse generated on-site should be stored in enclosed bins or compaction units separately from construction and chemical wastes. • A reputable waste collector should be employed by the Contractor to remove general refuse from the site, separately from construction and chemical wastes, on	All construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		a daily basis to minimize odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law. • Aluminium cans are often recovered from the waste stream by individual collectors if they are segregated and made easily accessible. Separate labelled bins for their deposit should be provided if feasible. • Office wastes can be reduced through the recycling of paper if volumes are large enough to warrant collection. Participation in a local collection scheme should be considered by the Contractor. In addition, waste separation facilities for paper, aluminum cans, plastic bottles etc., should be provided. • Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including reduction, reuse and recycling of wastes. • Sufficient dustbins shall be provided for storage of waste as required under the Public Cleansing and Prevention of Nuisances By-laws. In addition, general refuse shall be cleared daily and shall be disposed of to the nearest licensed landfill or refuse transfer station. • All waste containers shall be in a secure area on hardstanding.		

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
Water Quality (Construction Phase)				
	W1	Mitigation during the marine works to reduce impacts to within acceptable levels have been recommended and will comprise a series of measures that restrict the method and sequencing of backfilling, as well as protection measures. Details of the measures are provided below: • Reclamation filling for the Project shall not proceed until at least 200m of leading seawall at the reclamation area formed above +2.2mPD, unless otherwise agreement was obtained from EPD, except for the 300m gaps for marine access. All underwater filling works shall be carried out behind seawalls to avoid dispersion of suspended solids outside the Project limit; • Except for the filling of the cellular structures, not more than 15% public fill shall be used for reclamation filling below +2.5mPD during construction of the seawall; • After the seawall is completed except for the 300m marine access as indicated in the EPs, not more than 30% public fill shall be used for reclamation filling below +2.5mPD, unless otherwise agreement from EPD was obtained; • Upon completion of 200m leading seawall, no more than a total of 60 filling barge trips per day shall be made with a cumulative maximum daily filling rate of 60,000	During filling	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		m3 for HKBCF and TMCLKL southern landfall reclamation during the filling operation; and • Upon completion of the whole section of seawall except for the 300m marine access as indicated in the EPs, no more than a total of 190 filling barge trips per day shall be made with a cumulative maximum daily filling rate of 190,000 m3 for the remaining filling operations for HKBCF and TMCLKL southern landfall reclamation. • Floating type perimeter silt curtains shall be around the HKBCF site before the commencement of marine works. Staggered layers of silt curtain shall be provided to prevent sediment loss at navigation accesses. The length of each staggered layers shall be at least 200m; • Single layer silt curtain to be applied around the North-east airport water intake; • The silt-curtains should be maintained in good condition to ensure the sediment plume generated from filling be confined effectively within the site boundary; • The filling works shall be scheduled to spread the works evenly over a working day; • Cellular structure shall be used for seawall construction; • A layer of geotextile shall be placed on top of the seabed before any filling activities take place inside the cellular structures to form the seawall; • The conveyor belts shall be fitted with windboards and conveyor release points shall be covered with curtain to prevent any spillage of filling materials onto the		

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		surrounding waters; and • An additional layer of silt curtain shall be installed near the active stone column installation points. A layer of geotextile with stone blanket on top shall be placed on the seabed prior to stone column installation works.		
S9.11.1.3 of HKBCFEIA and S6.10 of TMCLKLEIA	W2	<u>Land Works</u> General construction activities on land should also be governed by standard good working practice. Specific measures to be written into the works contracts should include: • wastewater from temporary site facilities should be controlled to prevent direct discharge to surface or marine waters; • sewage effluent and discharges from on-site kitchen facilities shall be directed to Government sewer in accordance with the requirements of the WPCO or collected for disposal offsite. The use of soakaways shall be avoided; • storm drainage shall be directed to storm drains via adequately designed sand/silt removal facilities such as sand traps, silt traps and sediment basins. Channels, earth bunds or sand bag barriers should be provided on site to properly direct stormwater to such silt removal facilities. Catchpits and perimeter channels should be constructed in advance of site formation works and earthworks; • silt removal facilities, channels and manholes shall be maintained and any	All land-based construction sites	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		deposited silt and grit shall be removed regularly, including specifically at the onset of and after each rainstorm; • temporary access roads should be surfaced with crushed stone or gravel; • rainwater pumped out from trenches or foundation excavations should be discharged into storm drains via silt removal facilities; • measures should be taken to prevent the washout of construction materials, soil, silt or debris into any drainage system; • open stockpiles of construction materials (e.g. aggregates and sand) on site should be covered with tarpaulin or similar fabric during rainstorms; • manholes (including any newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into foul sewers; • discharges of surface run-off into foul sewers must always be prevented in order not to unduly overload the foul sewerage system; • all vehicles and plant should be cleaned before they leave the construction site to ensure that no earth, mud or debris is deposited by them on roads. A wheel washing bay should be provided at every site exit; • wheel wash overflow shall be directed to silt removal facilities before being		

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		discharged to the storm drain; • the section of construction road between the wheel washing bay and the public road should be surfaced with crushed stone or coarse gravel; • wastewater generated from concreting, plastering, internal decoration, cleaning work and other similar activities, shall be screened to remove large objects; • vehicle and plant servicing areas, vehicle wash bays and lubrication facilities shall be located under roofed areas. The drainage in these covered areas shall be connected to foul sewers via a petrol interceptor in accordance with the requirements of the WPCO or collected for offsite disposal; • the contractors shall prepare an oil / chemical cleanup plan and ensure that leakages or spillages are contained and cleaned up immediately; • waste oil should be collected and stored for recycling or disposal, in accordance with the Waste Disposal Ordinance; • all fuel tanks and chemical storage areas should be provided with locks and be sited on sealed areas. The storage areas should be surrounded by bunds with a capacity equal to 110% of the storage capacity of the largest tank; and • surface run-off from bunded areas should pass through oil/grease traps prior to discharge to the storm water system..		
S9.14 of HKBCFEIA	W3	Implement a water quality monitoring programme	At identified monitoring location	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
and S6.10 of TMCLKLEIA				
S6.10 of TMCLKLEIA	W4	All construction works shall be subject to routine audit to ensure implementation of all EIA recommendations and good working practice.	All construction site areas	V
Ecology (Construction Phase)				
S10.7 of HKBCFEIA and S8.14 of TMCLKLEIA	E1	• Install silt curtain during the construction • Limit works fronts • Construct seawall prior to reclamation filling where practicable • Good site practices • Strict enforcement of no marine dumping • Site runoff control • Spill response plan	Seawall, reclamation area	V
S10.7 of HKBCFEIA	E2	• Watering to reduce dust generation; prevention of siltation of freshwater habitats; Site runoff should be desilted, to reduce the potential for suspended sediments, organics and other contaminants to enter streams and standing freshwater.	Land-based works areas	V
S10.7 of HKBCFEIA and S8.14 of TMCLKLEIA	E3	• Good site practices, including strictly following the permitted works hours, using quieter machines where practicable, and avoiding excessive lightings during night time.	Land-based works areas	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
S10.7 of HKBCFEIA and S8.14 of TMCLKLEIA	E4	• Dolphin Exclusion Zone • Dolphin watching plan	Marine works	V
S10.7 of HKBCFEIA and S8.14 of TMCLKLEIA	E5	• Decouple compressors and other equipment on working vessels • Proposal on design and implementation of acoustic decoupling measures applied during reclamation works • Avoidance of percussive piling	Marine works	V
S10.7 of HKBCFEIA and S8.14 of TMCLKLEIA	E6	• Control vessel speed • Skipper training • Predefined and regular routes for working vessels; avoid Brothers Islands	Marine traffic	V
S10.10 of HKBCFEIA and S8.14 of TMCLKLEIA	E7	• Vessel based dolphin monitoring	Northeast and Northwest Lantau	V
Fisheries				
S11.7 of HKBCFEIA	F1	• Reduce re-suspension of sediments • Limit works fronts • Good site practices	Seawall, reclamation area	V

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
		• Strict enforcement of no marine dumping • Spill response plan		
S11.7 of HKBCFEIA	F2	• Install silt-grease trap in the drainage system collecting surface runoff	Reclamation area	V
Landscape & Visual (Construction Phase)				
S14.3.3. 3 of HKBCFEIA and S10.9 of TMCLKLEIA	LV1	*Mitigate Landscape Impacts* G1/CM4 Grass-hydroseed or sheeting bare soil surface and stock pile areas. G9 Reserve of loose natural granite rocks for re-use. Provide new coastline to adopt "natural-look" by means of using armour rocks in the form of natural rock materials and planting strip area accommodating screen buffer to enhance "natural-look" of new coastline.	All construction site areas	N/A
S10.9 of TMCLKLEIA	LV2	*Mitigate Landscape Impacts* CM7 Ensure no run-off into water body adjacent to the Project Area.	All construction site areas	V
S14.3.3. 3 of HKBCFEIA	LV4	*Mitigate Visual Impacts* V1 Minimize time for construction activities during construction period.	All construction site areas	V
S10.9 of TMCLKLEIA	LV5	*Mitigate Visual Impacts* CM6 Control night-time lighting and glare by hooding all lights.	All construction site areas	V
EM&A				

EIA Ref.	EM&A Log Ref	Environmental Mitigation Measures	Location	Implementation Status
S15.2.2 of HKBCFEIA	EM1	An Independent Environmental Checker needs to be employed as per the EM&A Manual.	All construction site areas	V
S15.5 - S15.6 of HKBCFEIA	EM2	• An Environmental Team needs to be employed as per the EM&A Manual. • Prepare a systematic Environmental Management Plan to ensure effective implementation of the mitigation measures. • An environmental impact monitoring needs to be implementing by the Environmental Team to ensure all the requirements given in the EM&A Manual are fully complied with.	All construction site areas	V

Legend: V = implemented; x = not implemented; N/A = not applicable

Appendix D - Summary of Action and Limit Levels

Table 1 – Action and Limit Levels for 1-hour TSP

Location	Action Level	Limit Level
AMS2	374 $\mu g/m^3$	500 $\mu g/m^3$
AMS3A*	368 $\mu g/m^3$	500 $\mu g/m^3$
AMS6	360 $\mu g/m^3$	500 $\mu g/m^3$
AMS7	370 $\mu g/m^3$	500 $\mu g/m^3$

Remarks: * Action Level set out at AMS3 Ho Yu College is adopted.

Table 2 – Action and Limit Levels for 24-hour TSP

Location	Action Level	Limit Level
AMS2	176 $\mu g/m^3$	260 $\mu g/m^3$
AMS3A*	167 $\mu g/m^3$	260 $\mu g/m^3$
AMS6	173 $\mu g/m^3$	260 $\mu g/m^3$
AMS7	183 $\mu g/m^3$	260 $\mu g/m^3$

Remarks: * Action Level set out at AMS3 Ho Yu College is adopted.

Table 3 – Action and Limit Levels for Construction Noise (0700-1900 hrs of normal weekdays)

Location	Action Level	Limit Level
NMS2	When one documented complaint, related to 0700 – 1900 hours on normal weekdays, is received from any one of the sensitive receivers	75 dB(A)
NMS3A		*65 / 70 dB(A)

*Daytime noise Limit Level of 70 dB(A) applies to education institutions, while 65dB(A) applies during school examination period.

Table 4 – Action and Limit Levels for Water Quality

Parameters	**Action**	**Limit**
DO in mg L^{-1} (Surface, Middle & Bottom)	Surface and Middle 5.0 Bottom 4.7	Surface and Middle 4 .2 (except 5 mg/L for FCZ) Bottom 3.6
SS in mg L^{-1} (depth-averaged)	23.5 and 120% of upstream control station's SS at the same tide of the same day	34.4 and 130% of upstream control station's SS at the same tide of the same day and 10mg/L for WSD Seawater intakes
Turbidity in NTU (depth-averaged)	27.5 and 120% of upstream control station's turbidity at the same tide of the same day	47.0 and130% of upstream control station's turbidity at the same tide of the same day

Notes:

1. "depth-averaged" is calculated by taking the arithmetic means of reading of all three depths.
2. For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limits.
3. For turbidity, SS, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.

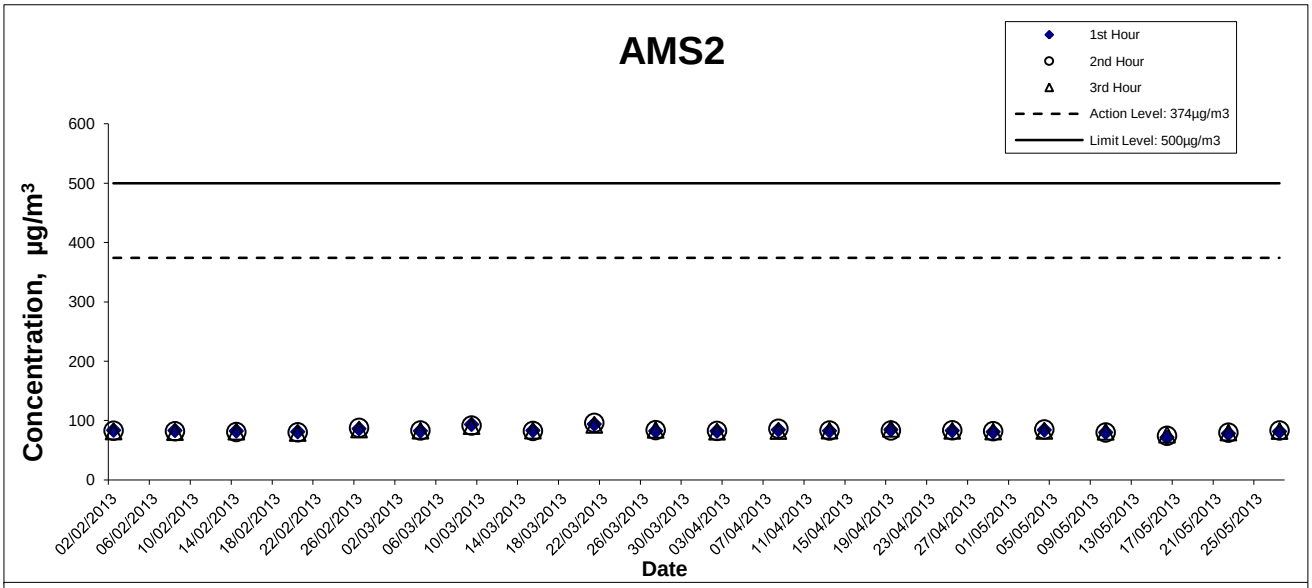
Table 5(a) Action and Limit Levels for Chinese White Dolphin Monitoring - Approach to Define Action Level (AL) and Limit Level (LL):

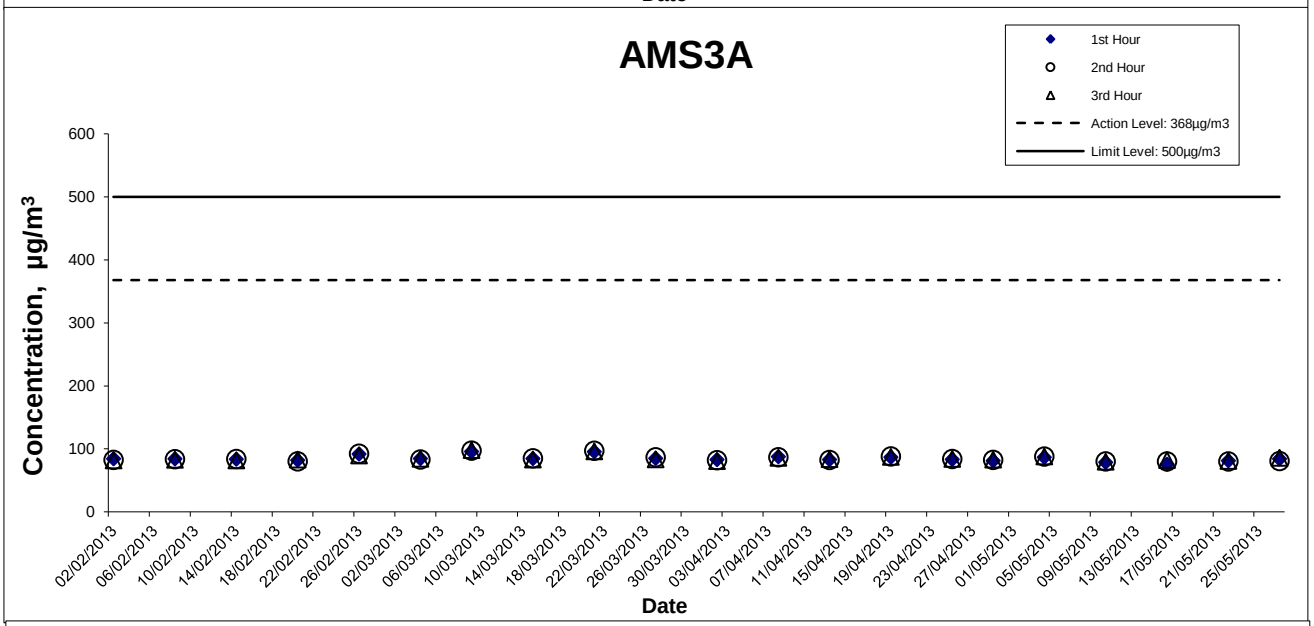
	North Lantau Social Cluster	
	NEL	**NWL**
Action Level	(STG < 70% of baseline) & (ANI < 70% of baseline)	(STG < 70% of baseline) & (ANI < 70% of baseline)
Limit Level	[(STG < 40% of baseline) & (ANI < 40% of baseline)] AND [(STG < 40% of baseline) & (ANI < 40% of baseline)]	

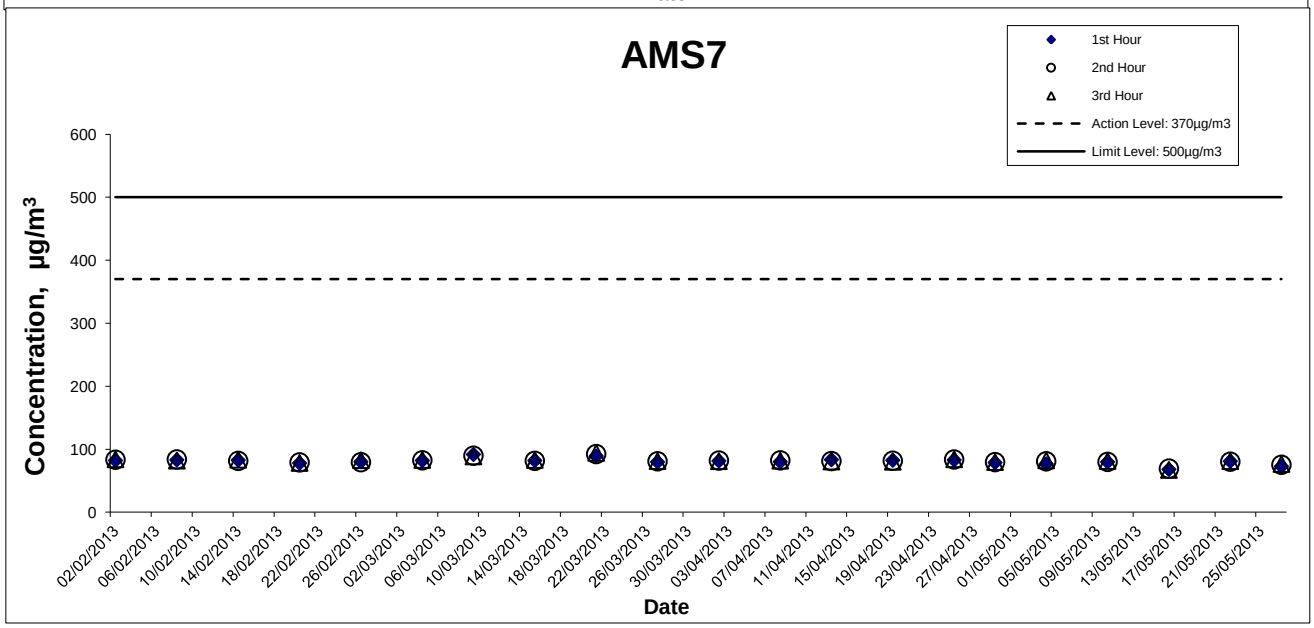
For North Lantau Social Cluster, action level will be trigger if either NEL **or** NWL fall below the criteria; limit level will be triggered if both NEL **and** NWL fall below the criteria.

Table 5(b) Derived Value of Action Level (AL) and Limit Level (LL) for Chinese White Dolphin Monitoring

	North Lantau Social Cluster	
	NEL	**NWL**
Action Level	(STG < 4.2) & (ANI < 15.5)	(STG < 6.9) & (ANI < 31.3)
Limit Level	[(STG < 2.4) & (ANI <8.9)] AND [(STG < 3.9)& (ANI < 17.9)]	







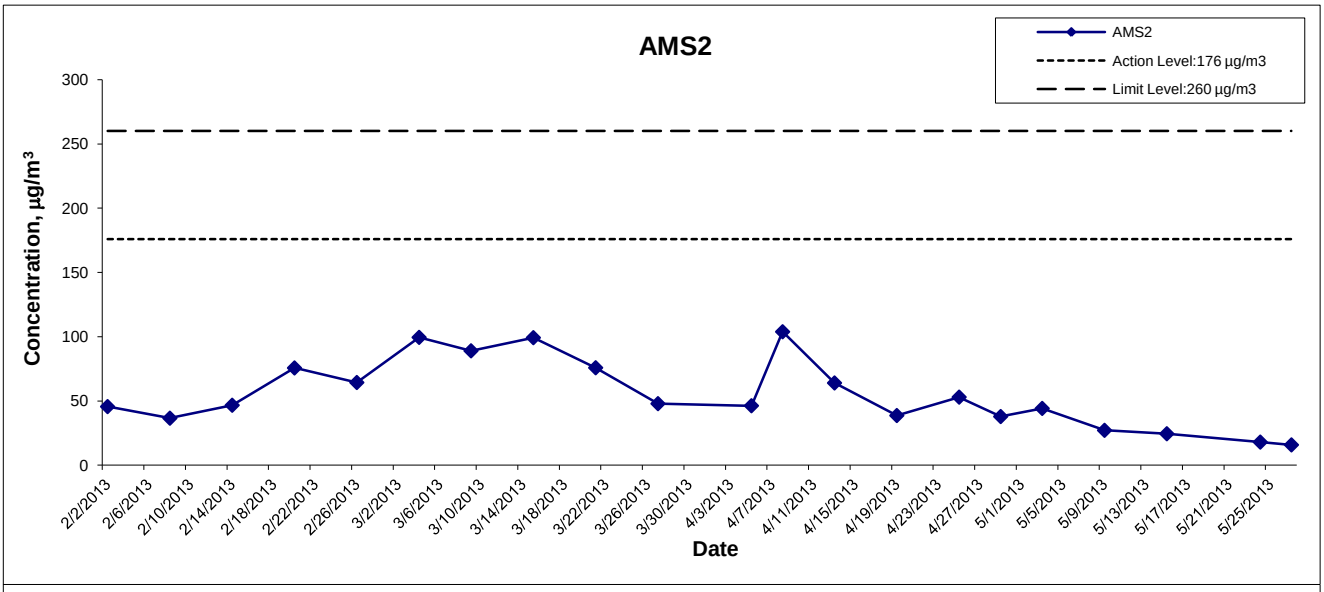
HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS

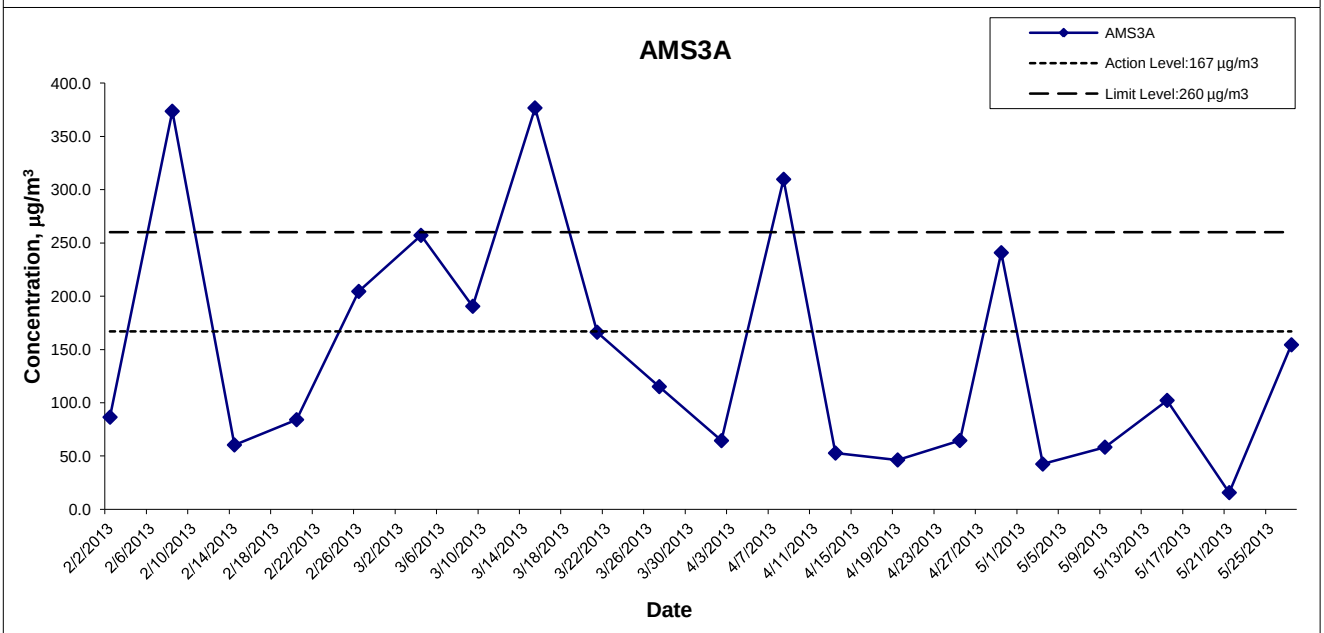
AECOM

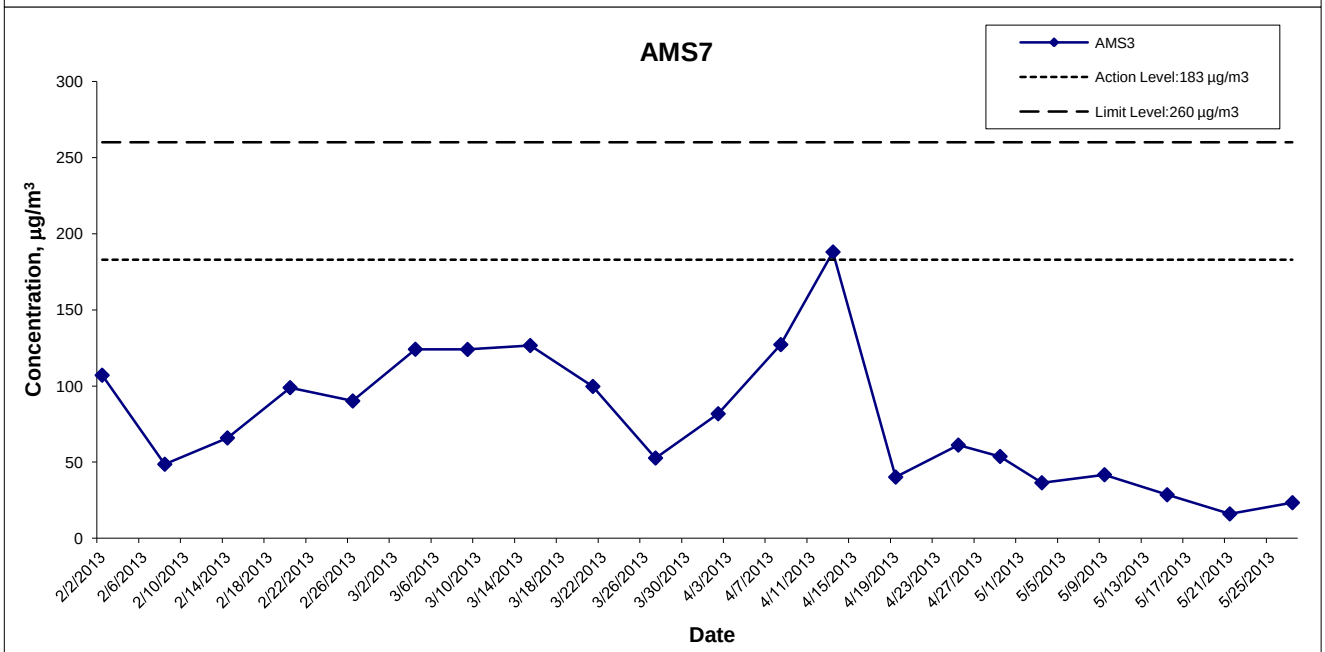
Graphical Presentation of Impact 1-hour TSP Monitoring Results

Project No.: 60249820 **Date: June 2013**

Appendix E



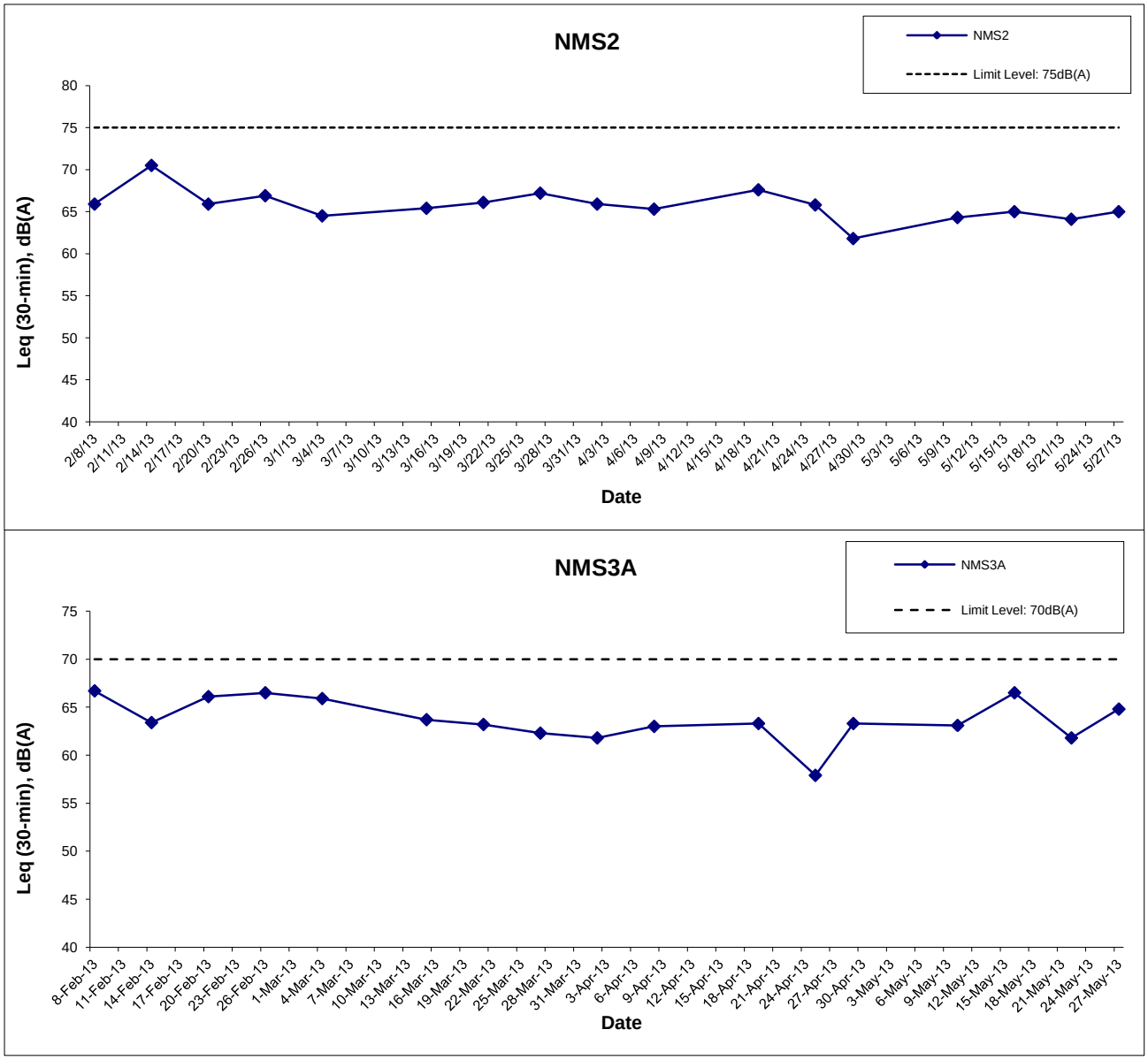




HONG KONG - ZHUHAI - MACAO BRIDGE
HONG KONG BOUNDARY CROSSING FACILITIES
- RECLAMATION WORKS

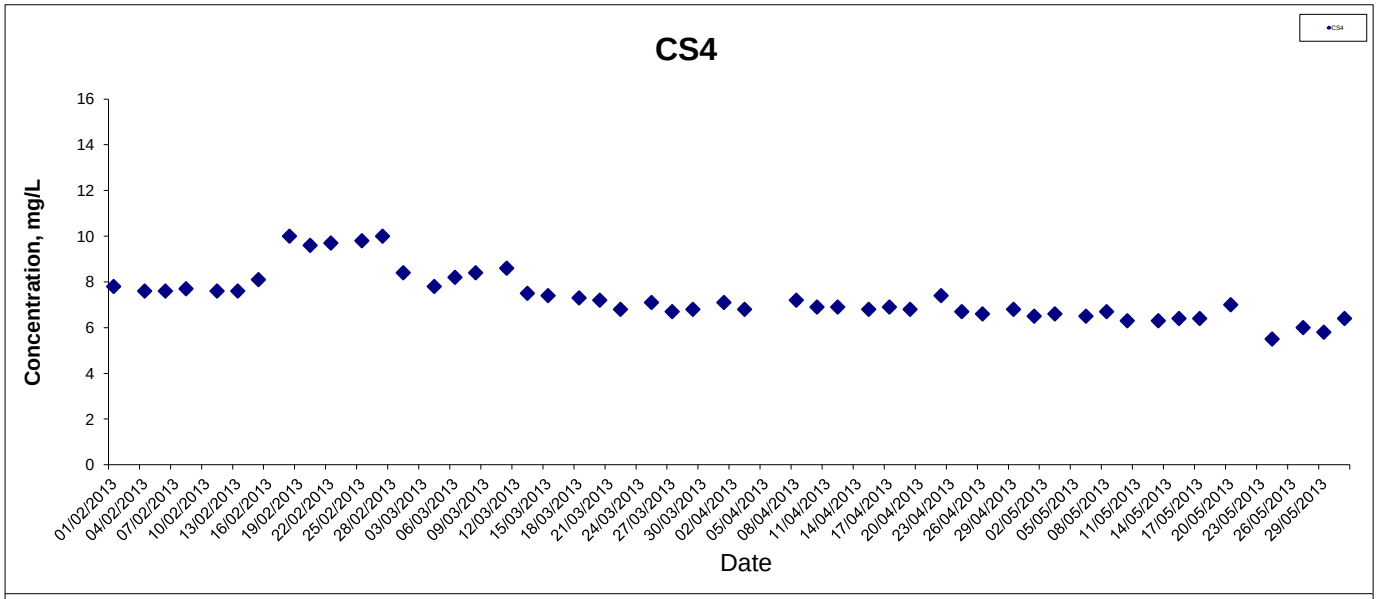
Graphical Presentation of Impact 24-hour TSP Monitoring Results

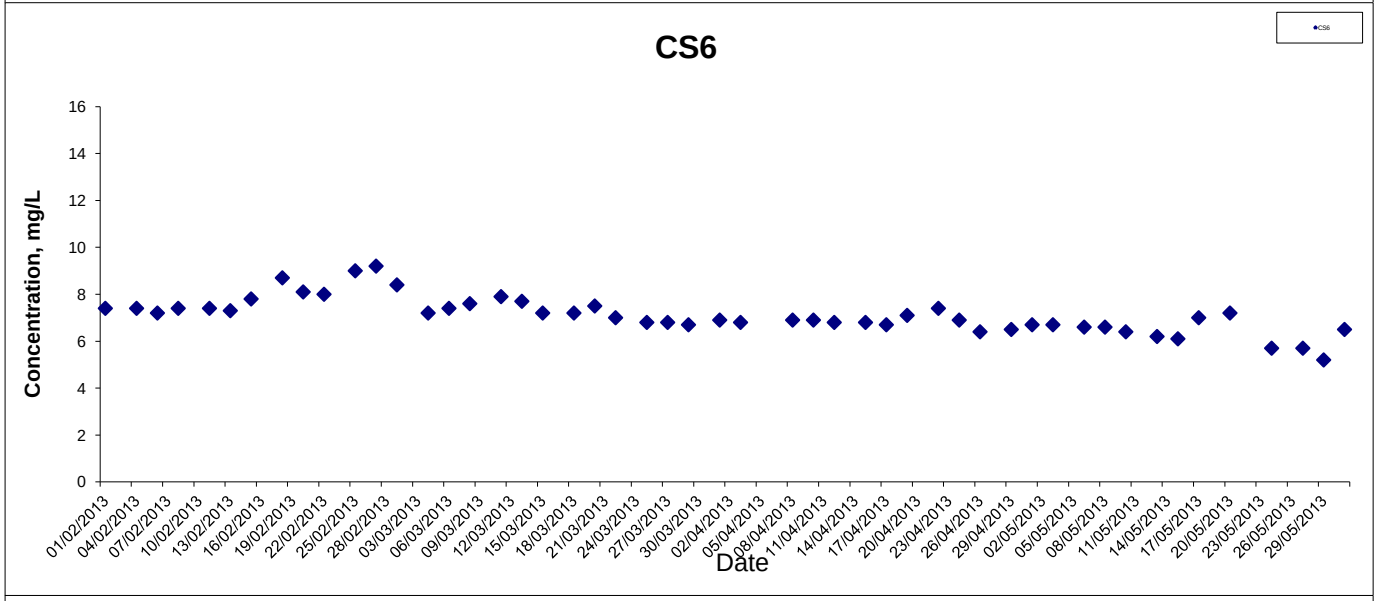
Project No.: 60249820 **Date: June 2013** **Appendix E**

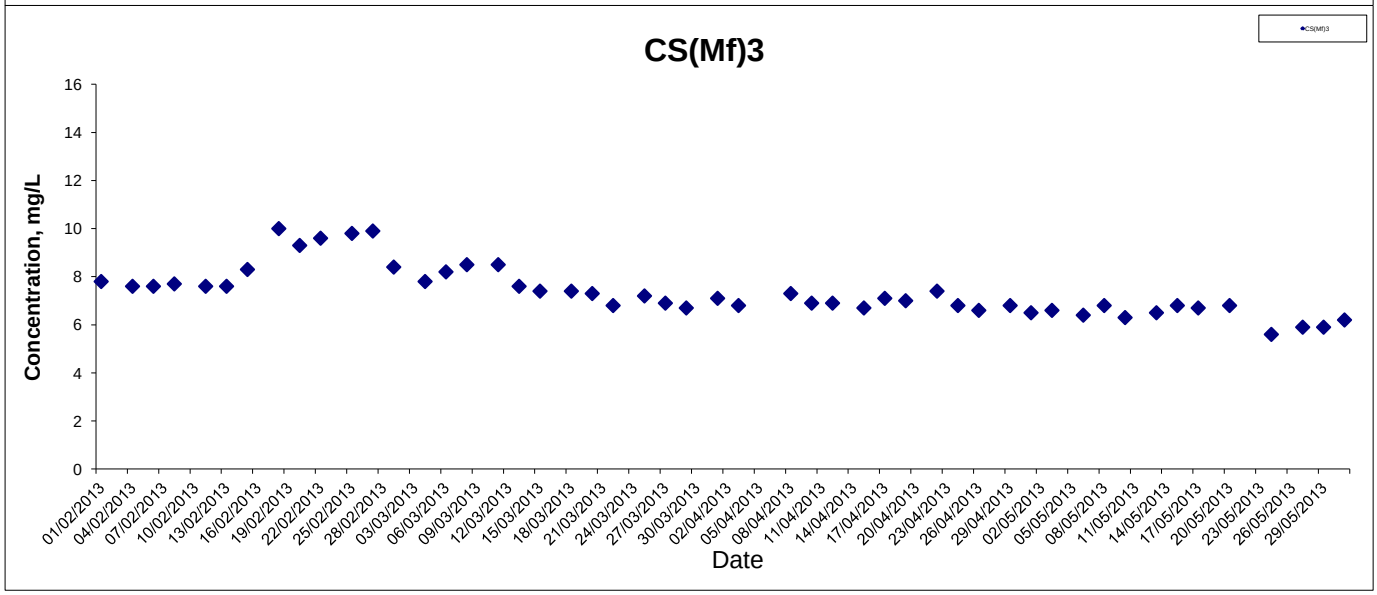


Remarks: Effective from July 2012, the Limit Level at NMS3A was revised to 70dB(A).

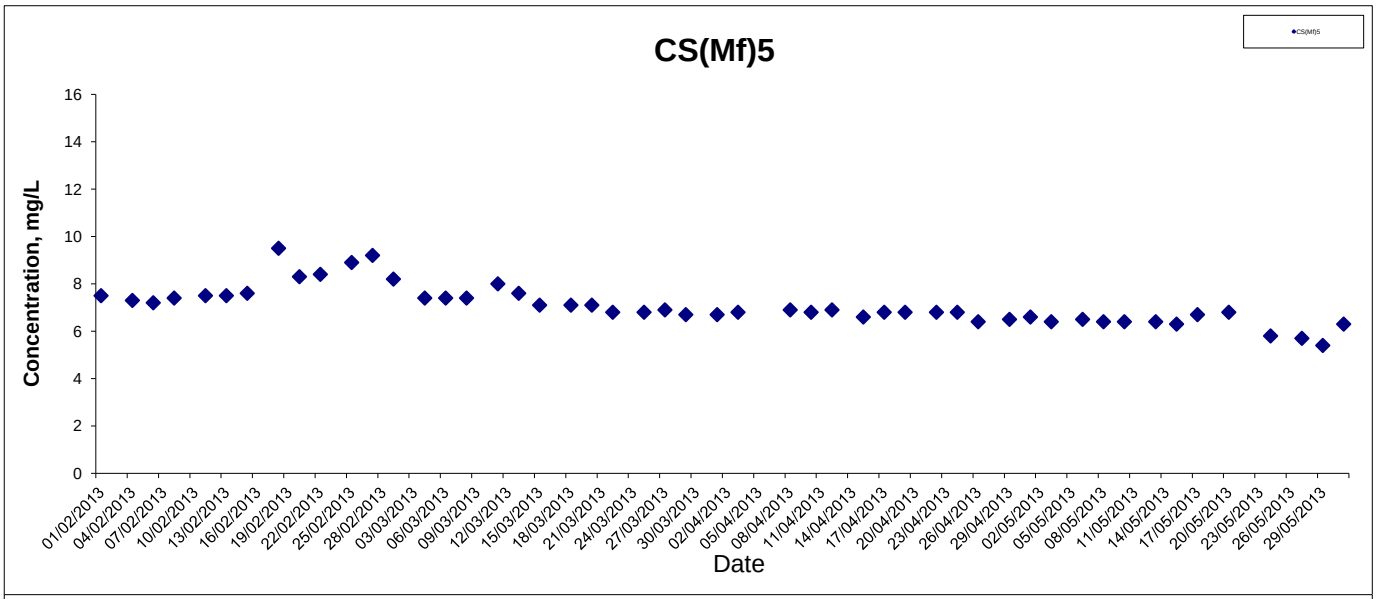
Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide

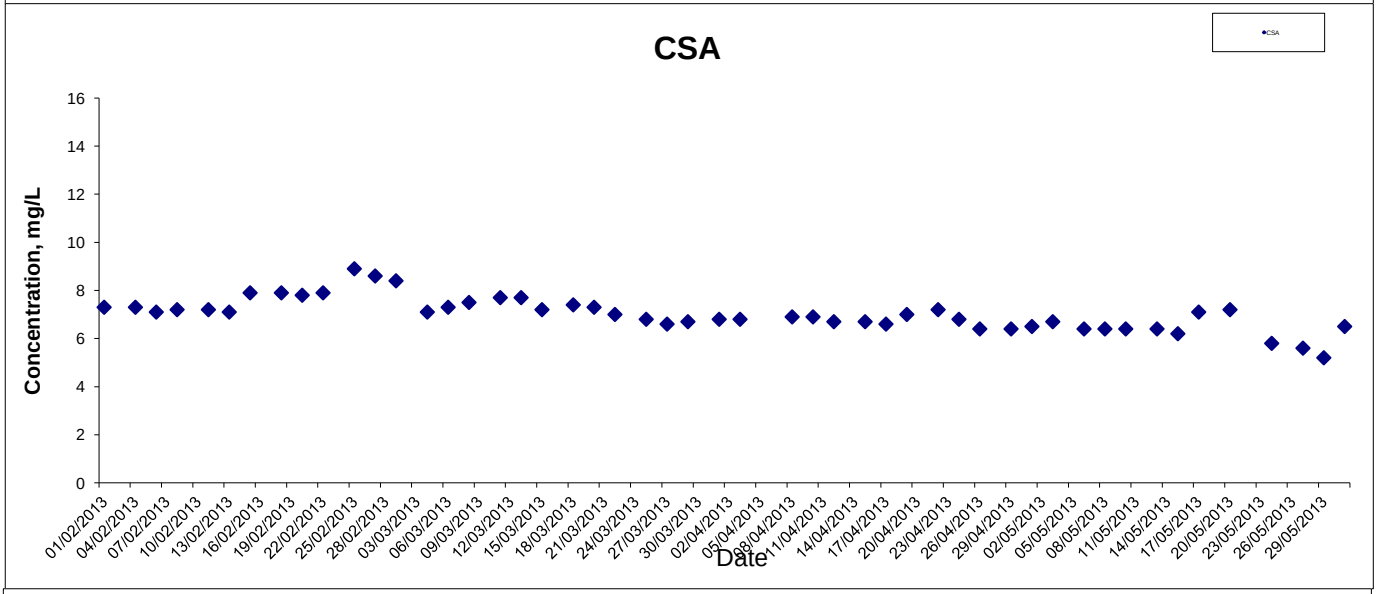


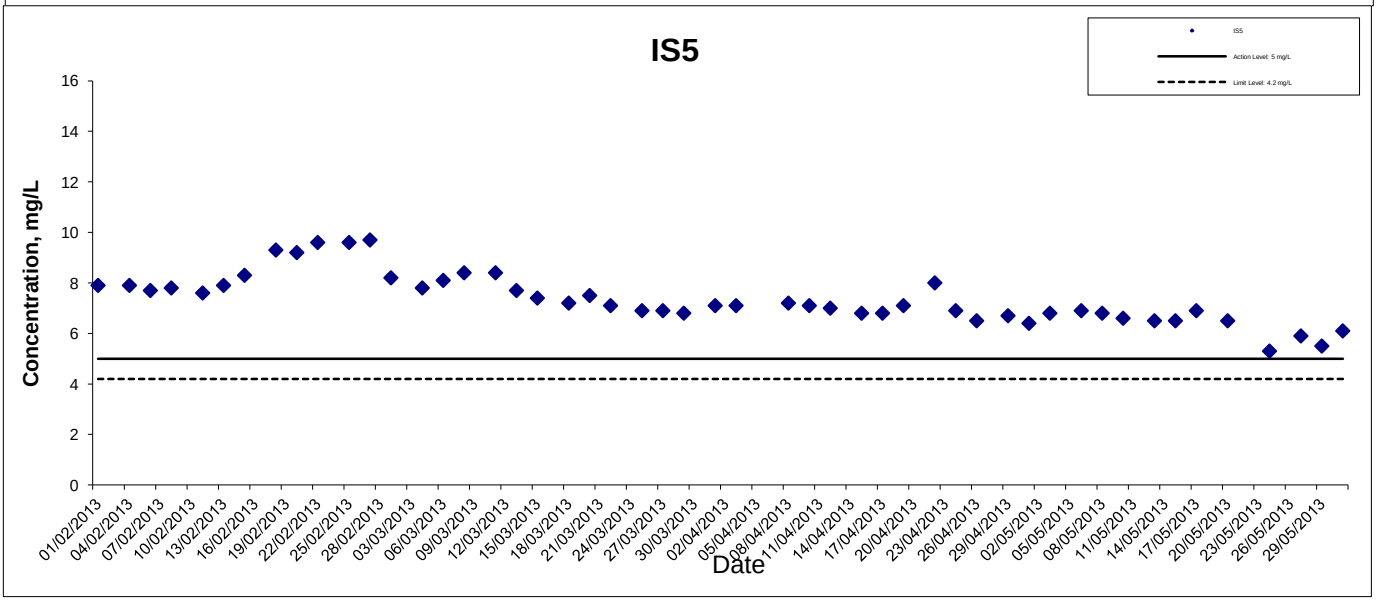




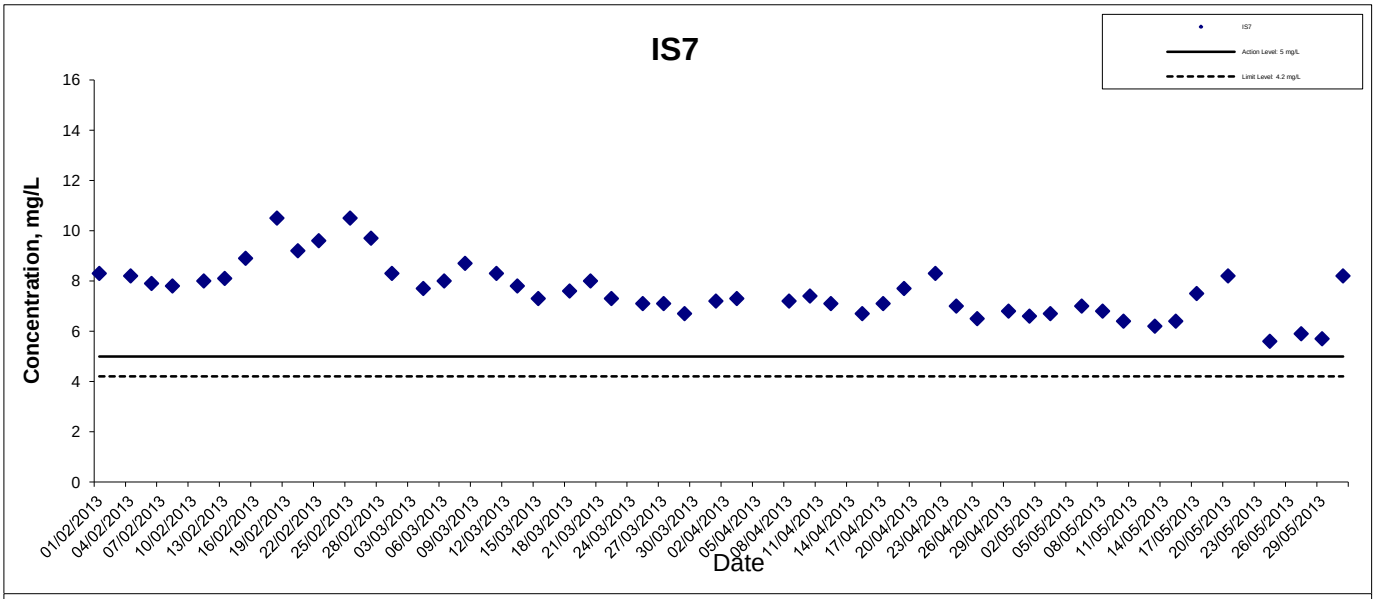
Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide

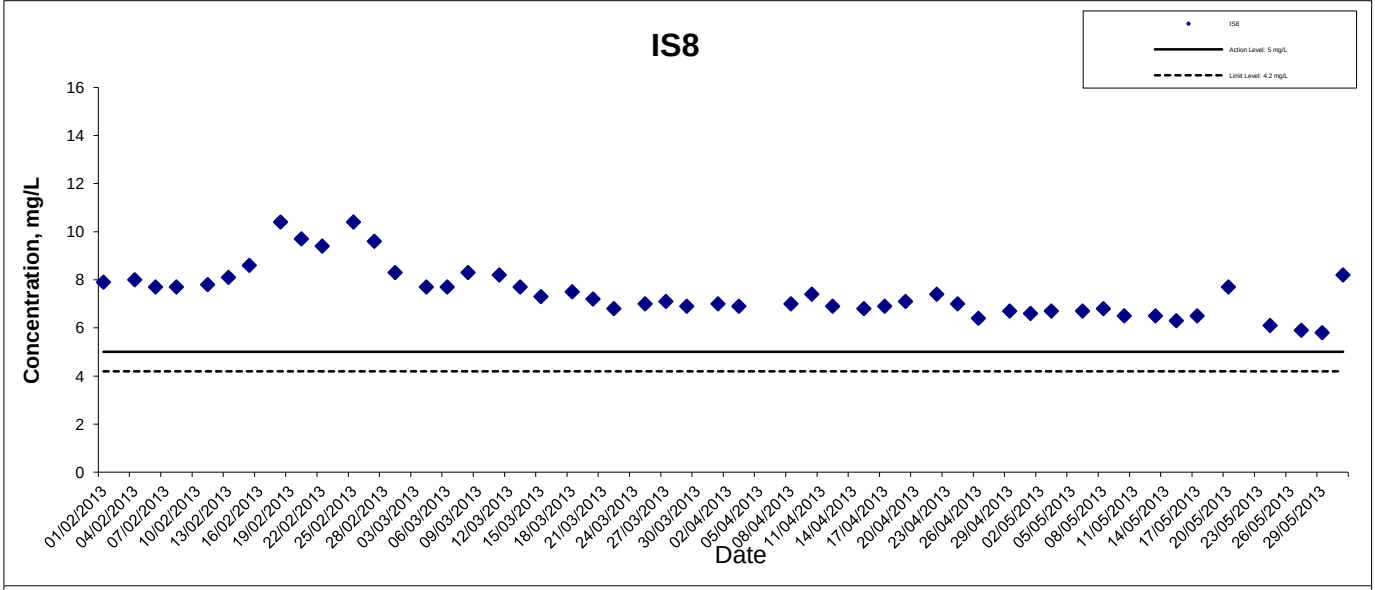


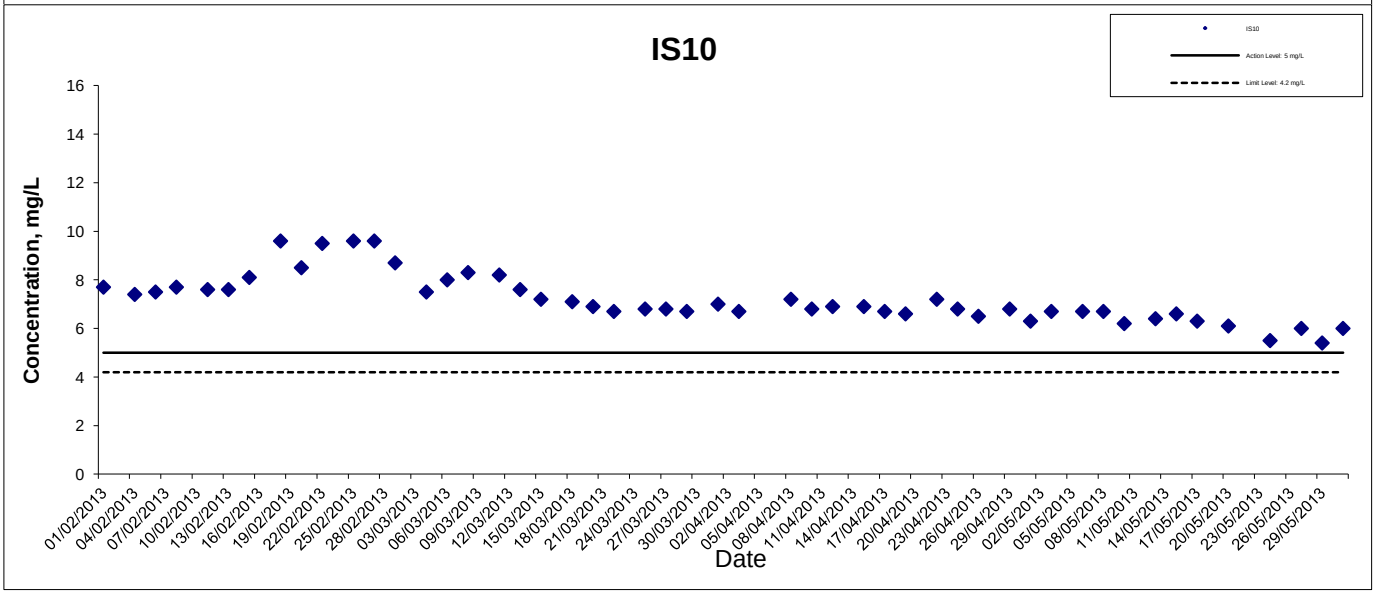




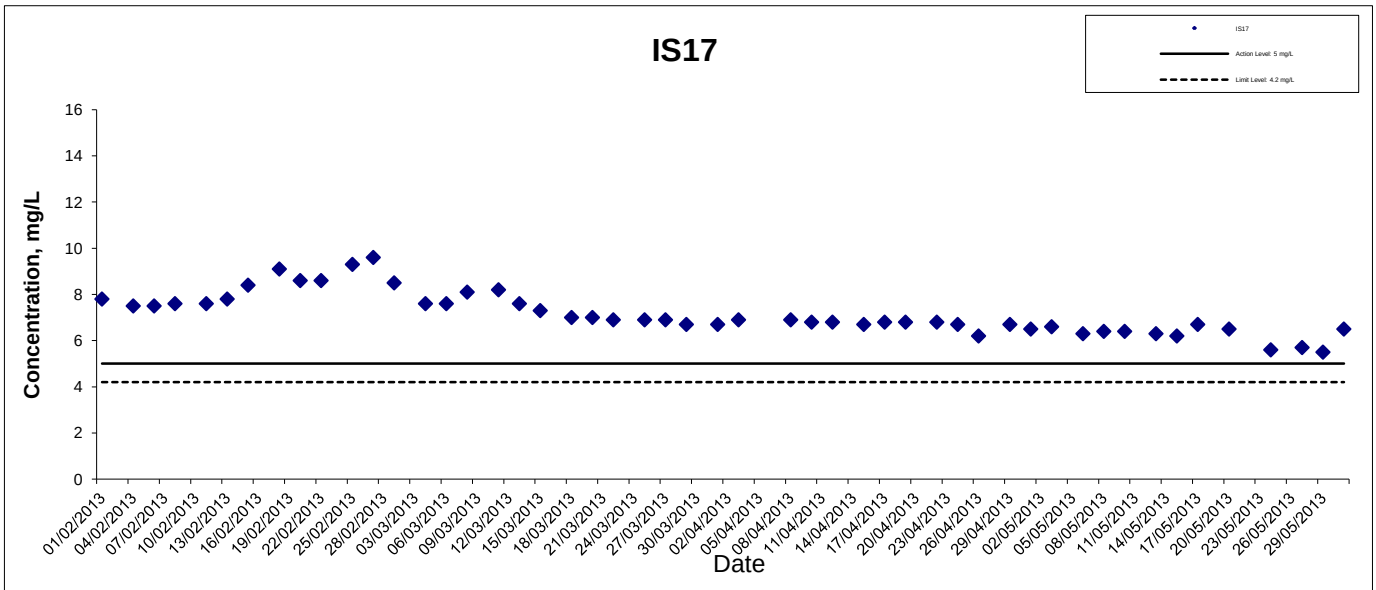
Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide

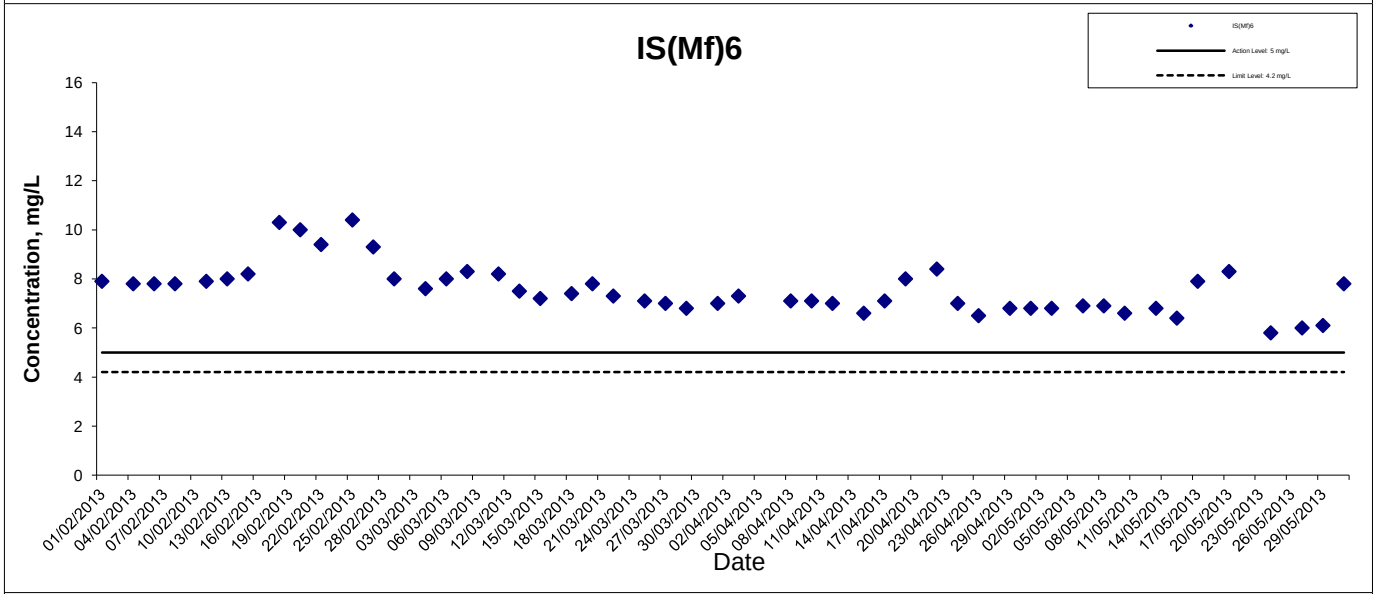


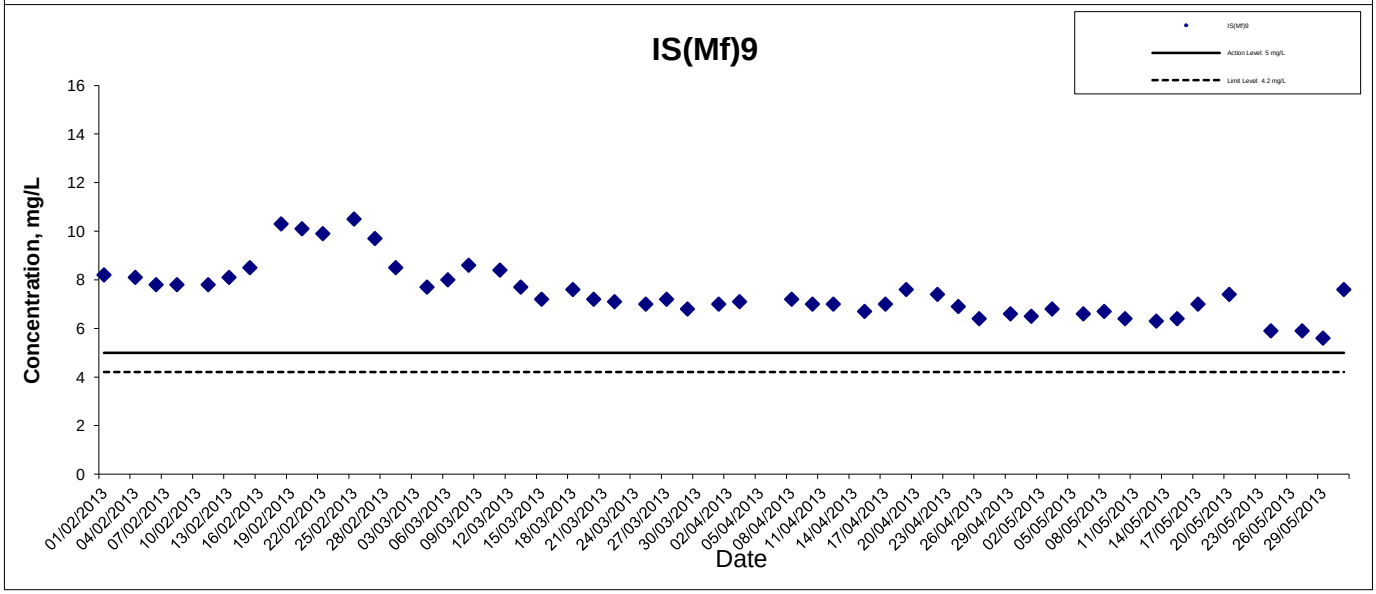




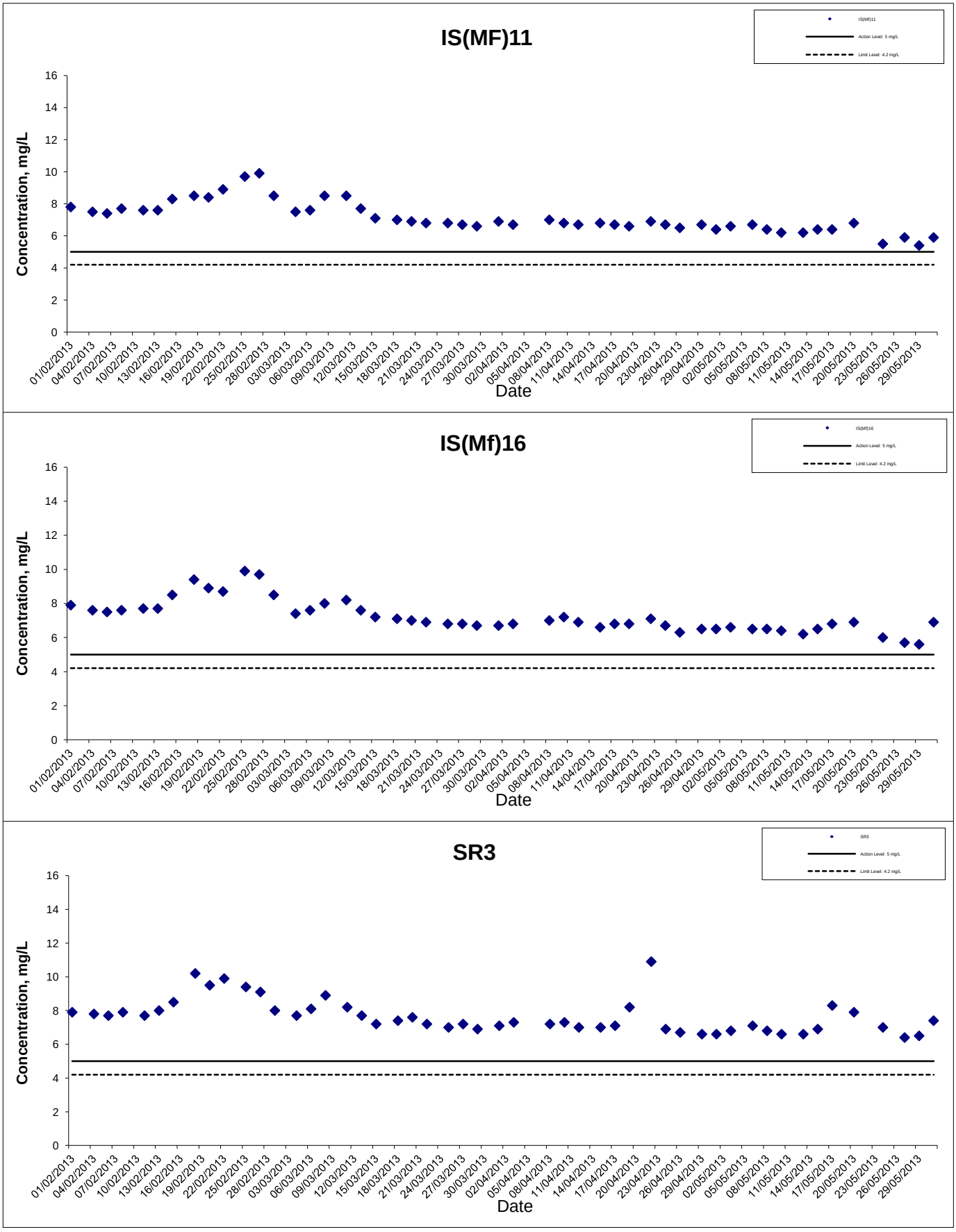
Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



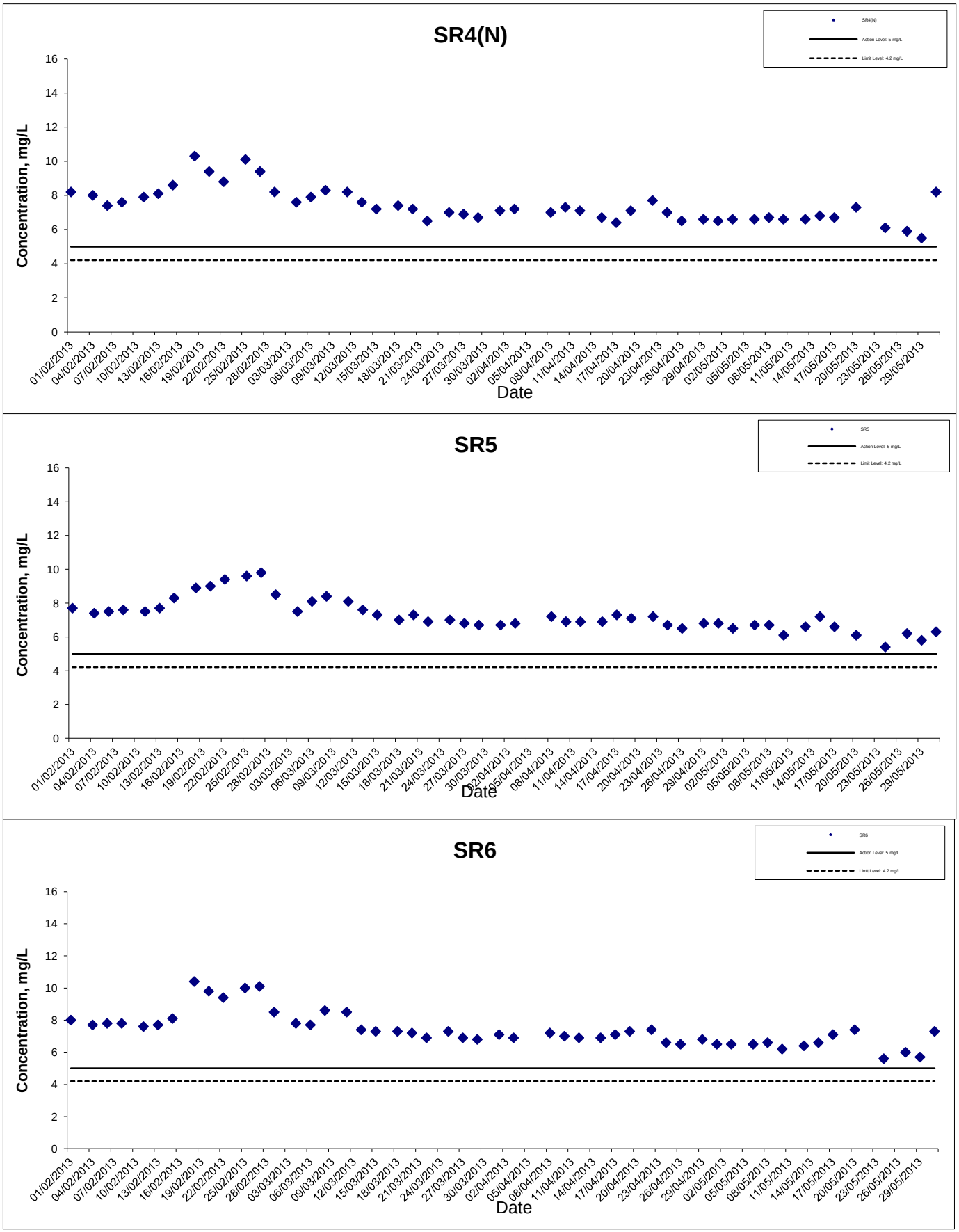




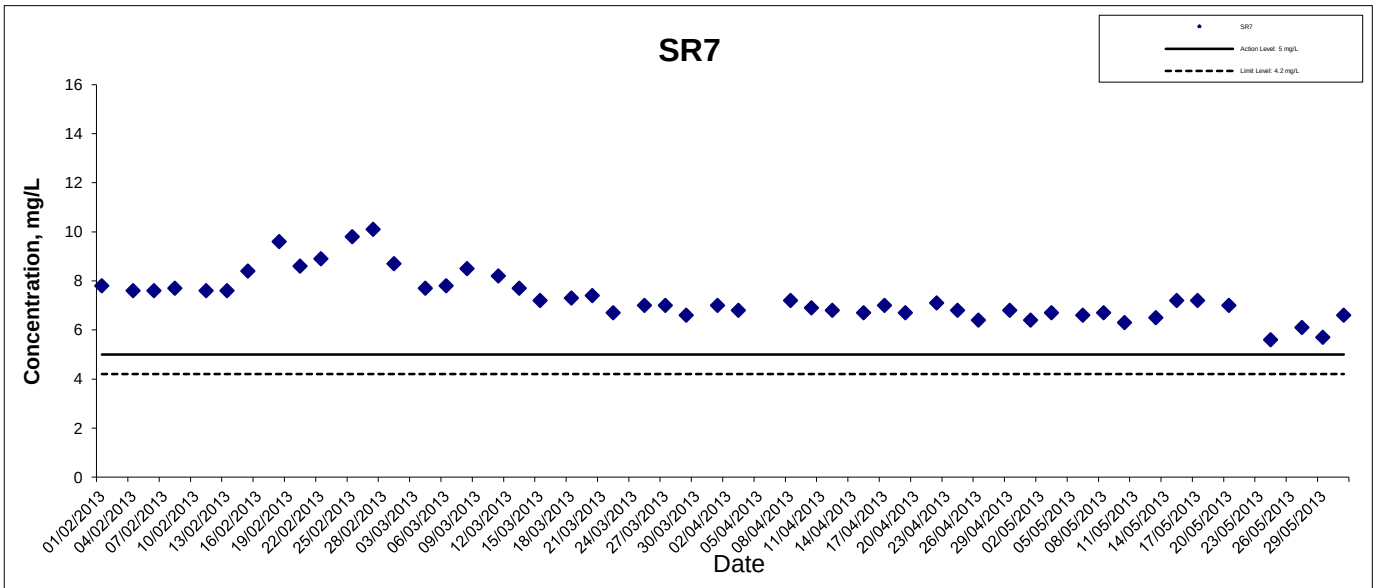
Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide

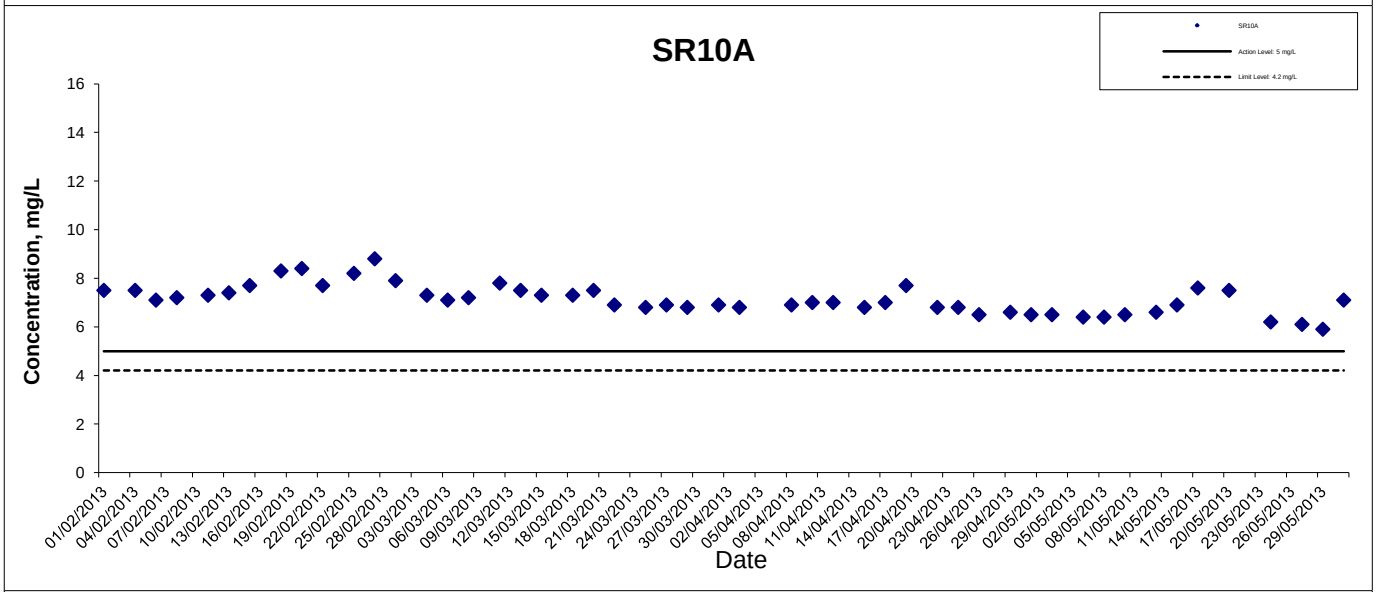


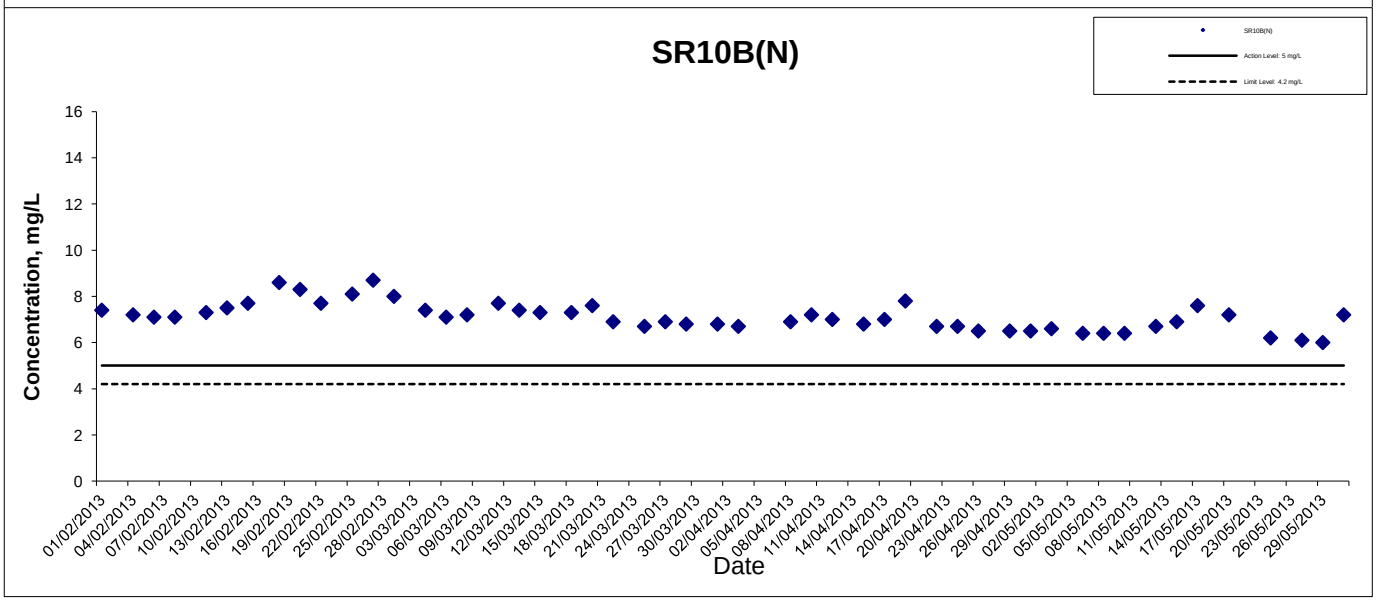
Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide



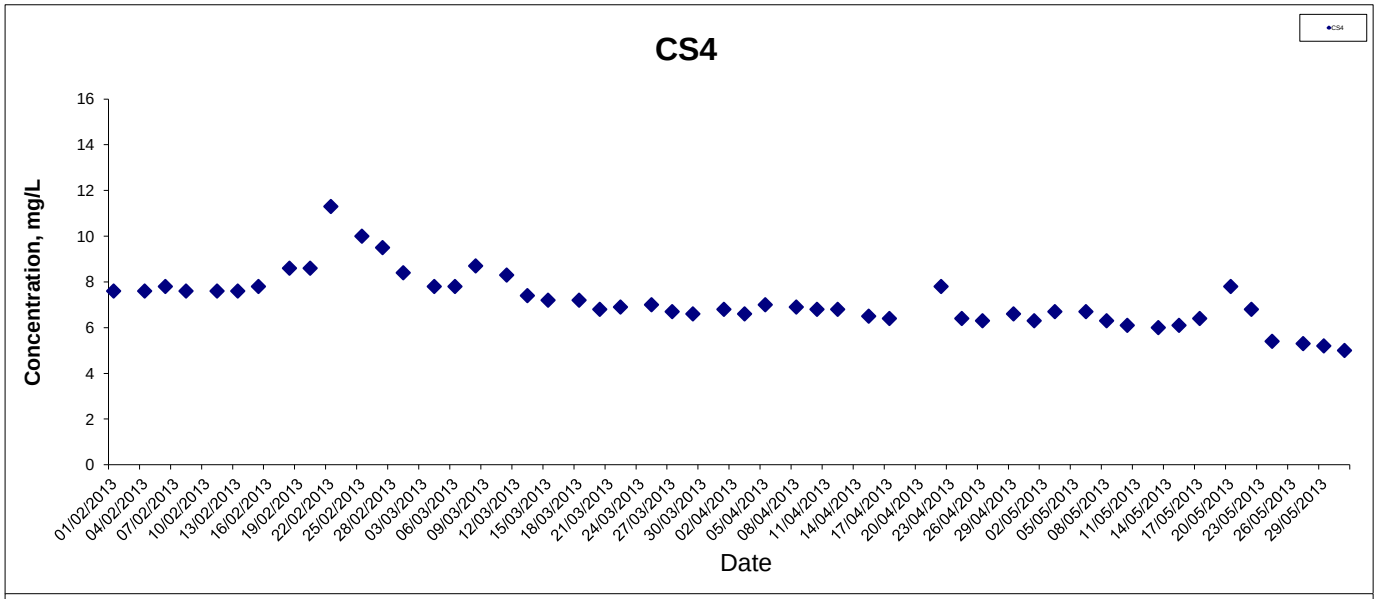
Dissolved Oxygen (Surface & Middle) at Mid-Ebb Tide

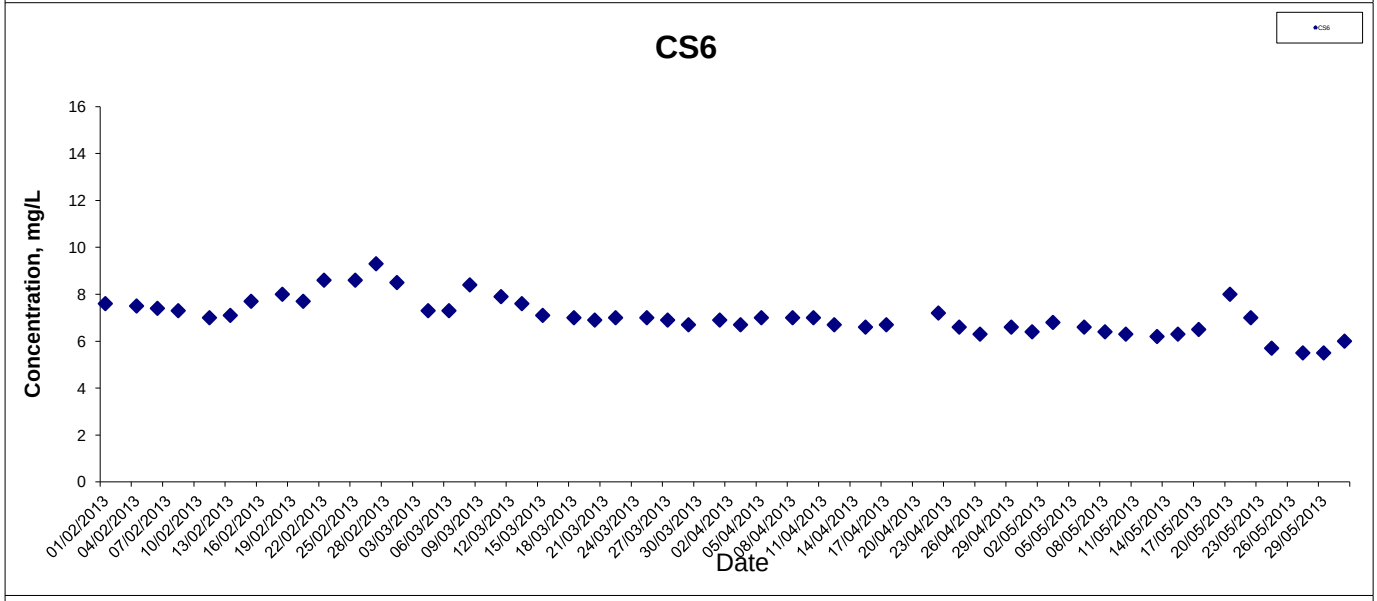


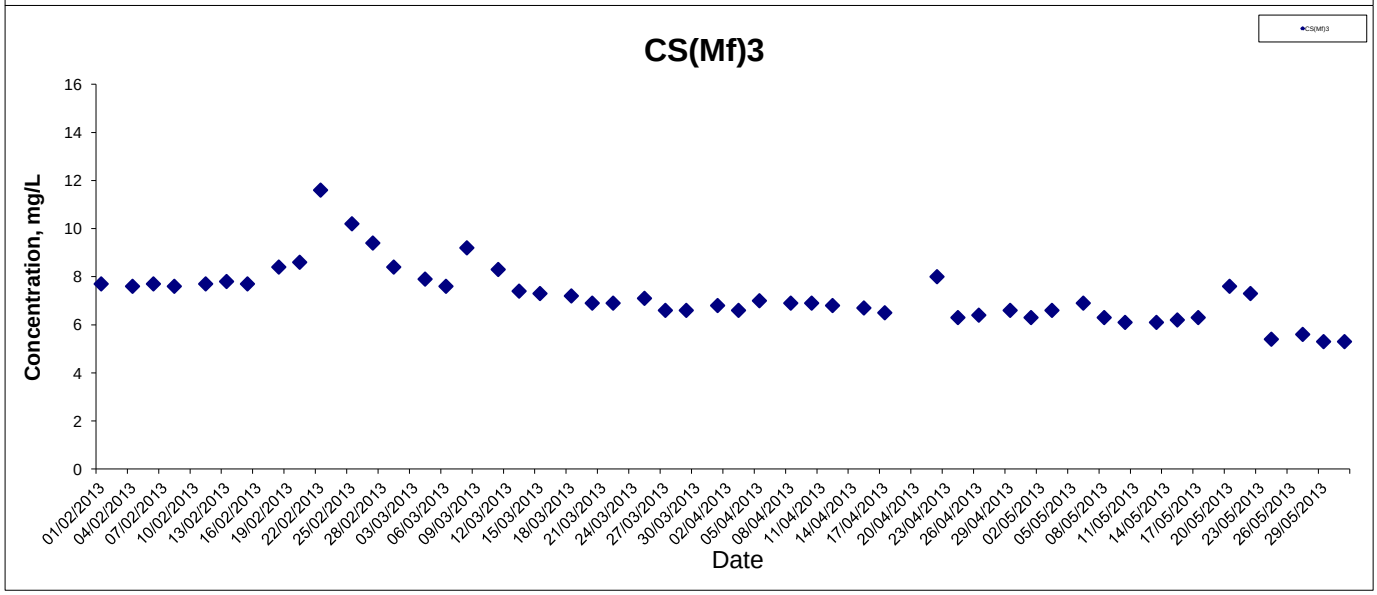




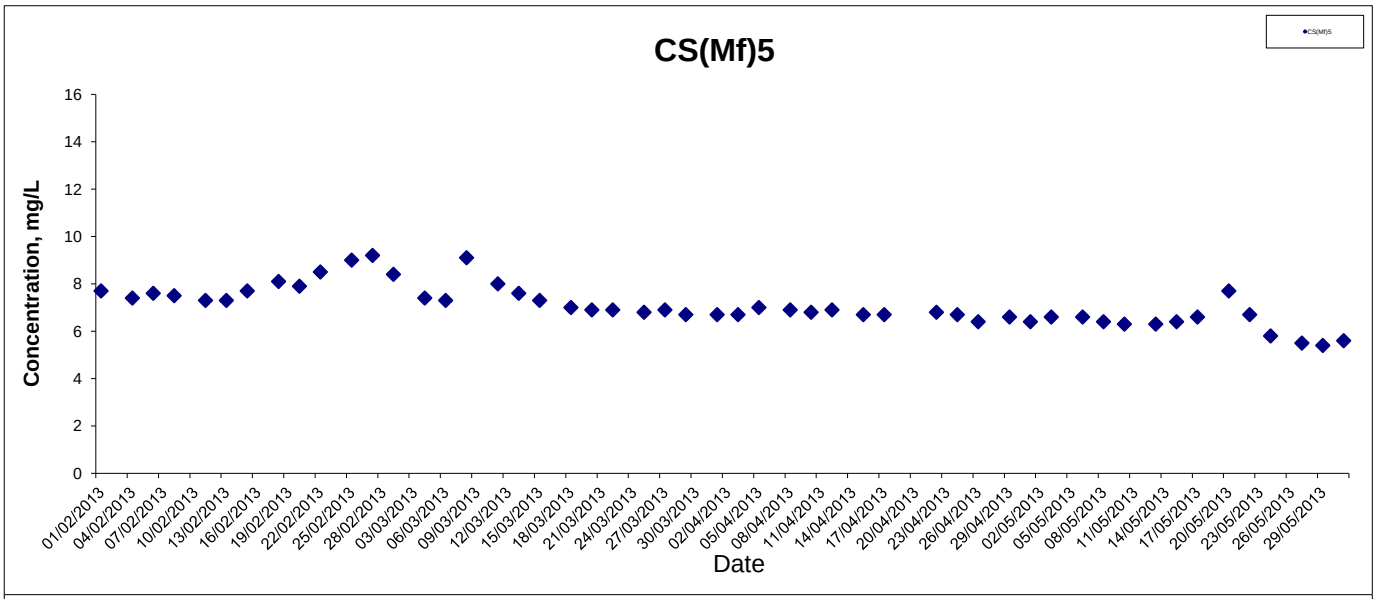
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide

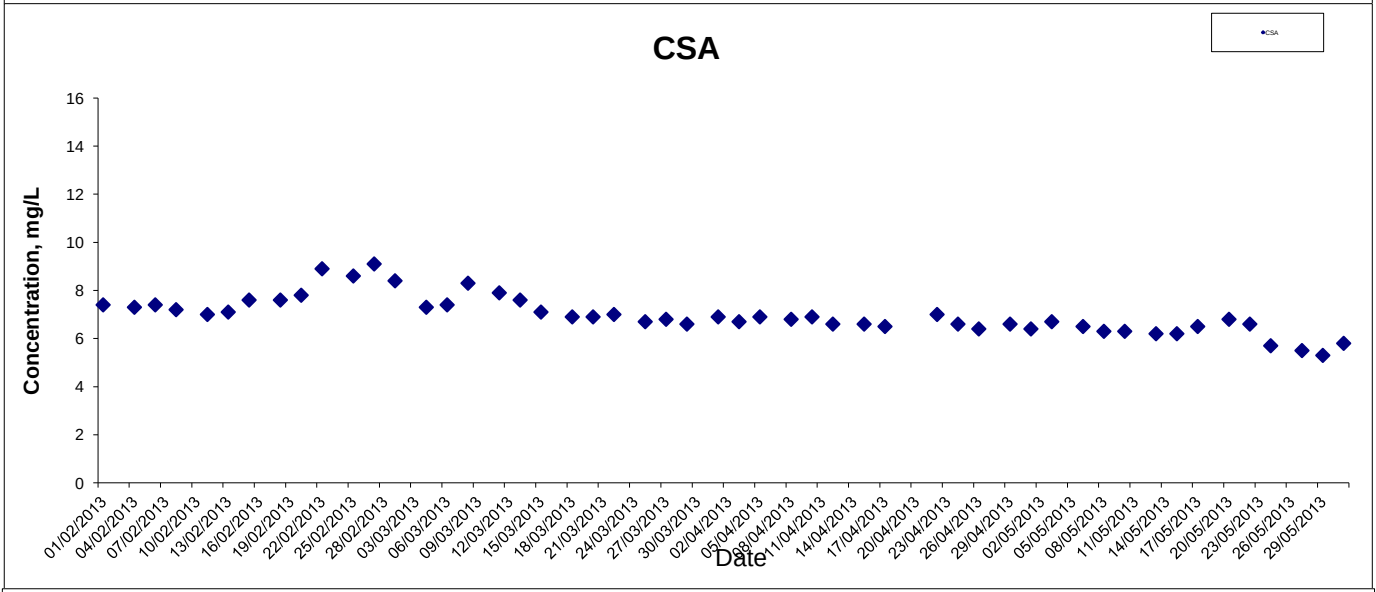


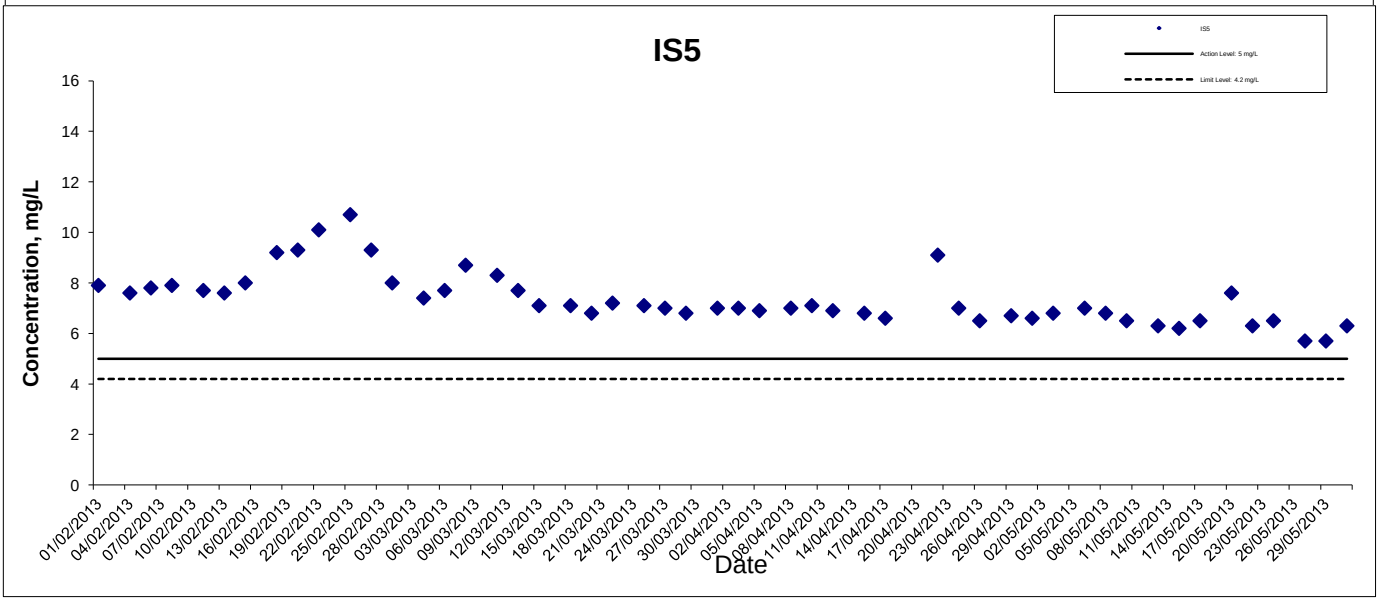




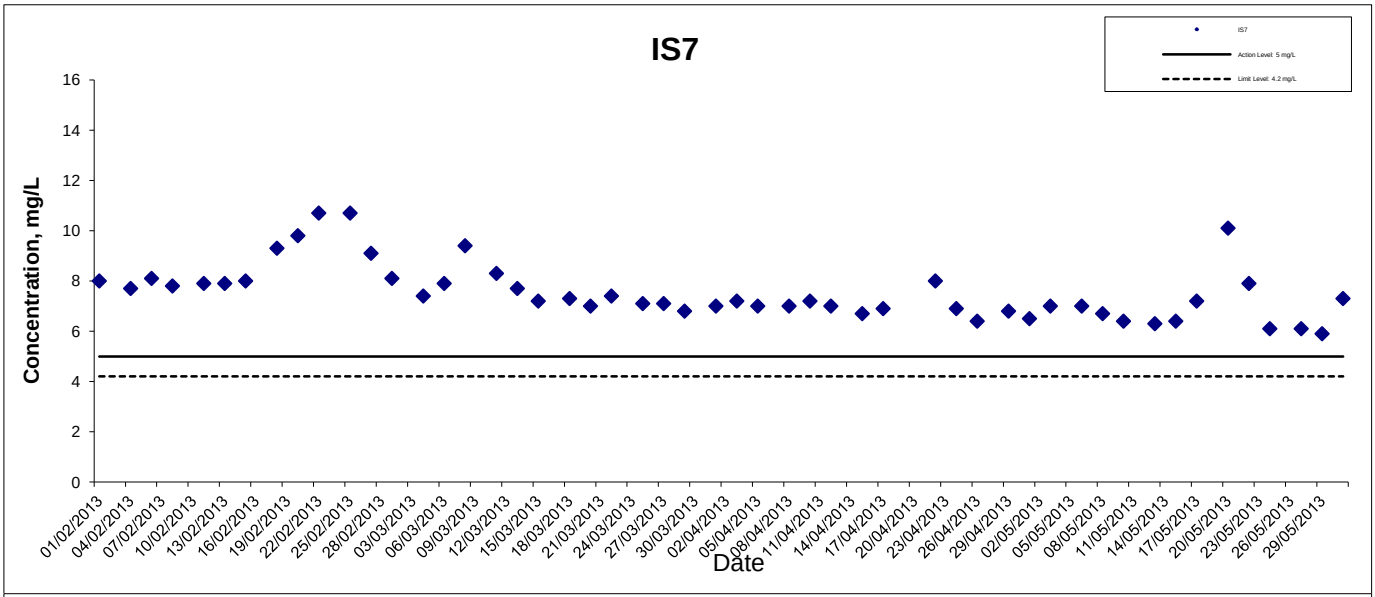
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide

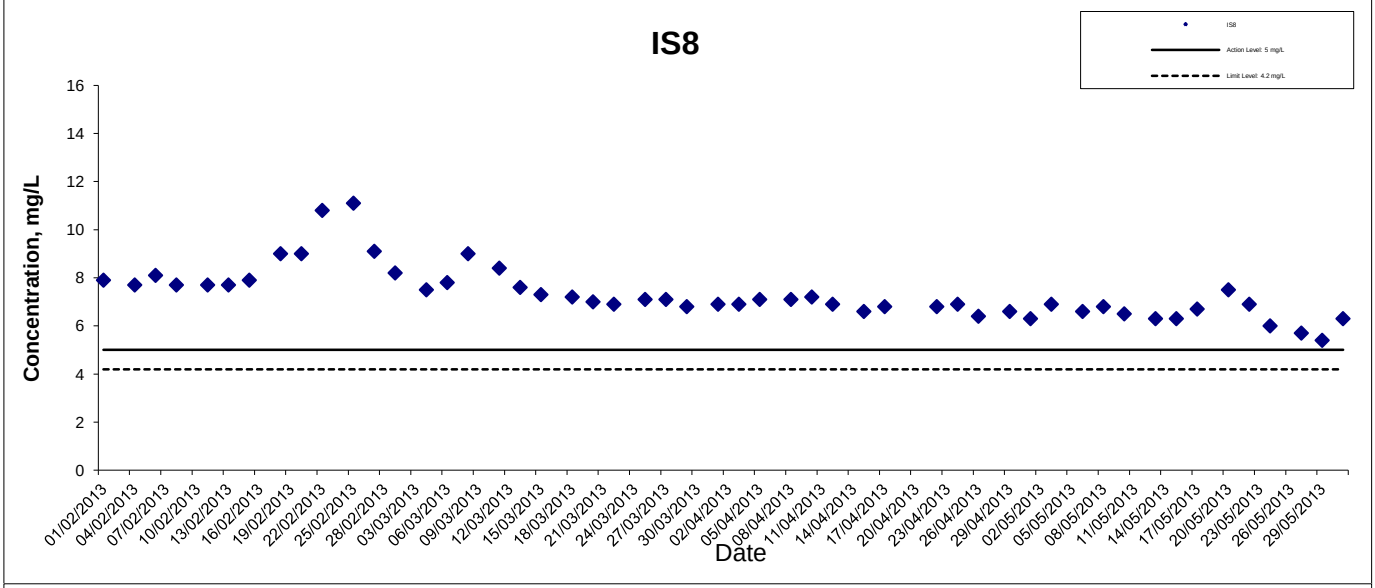


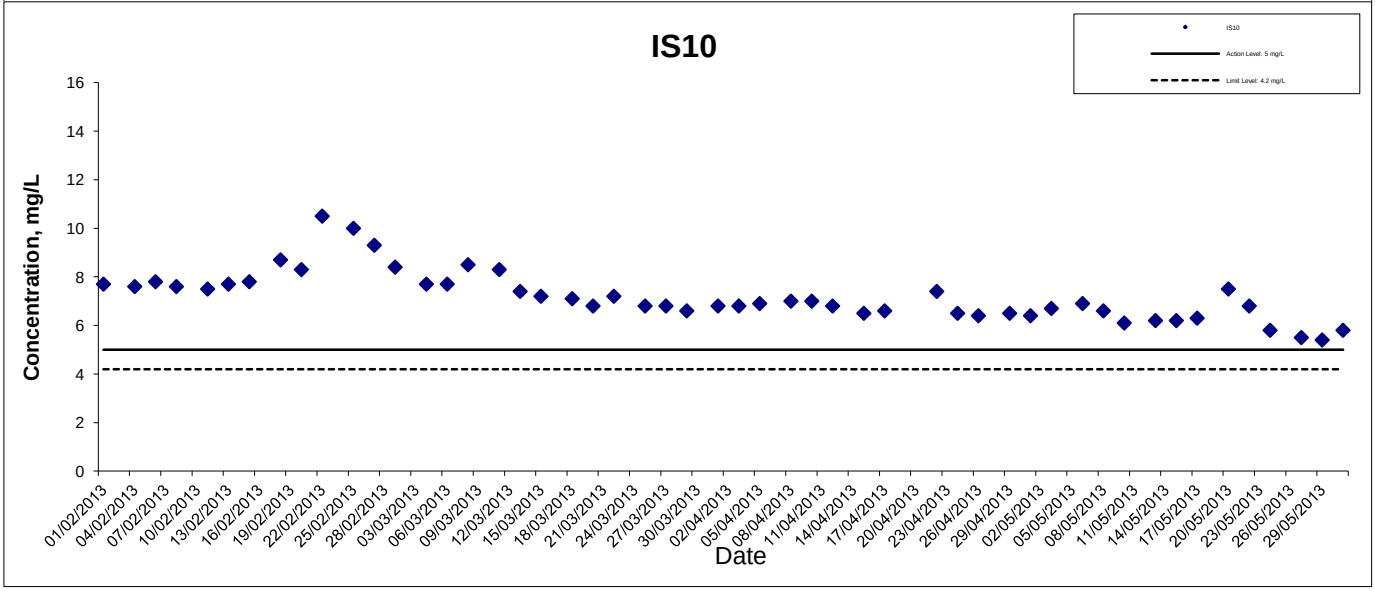




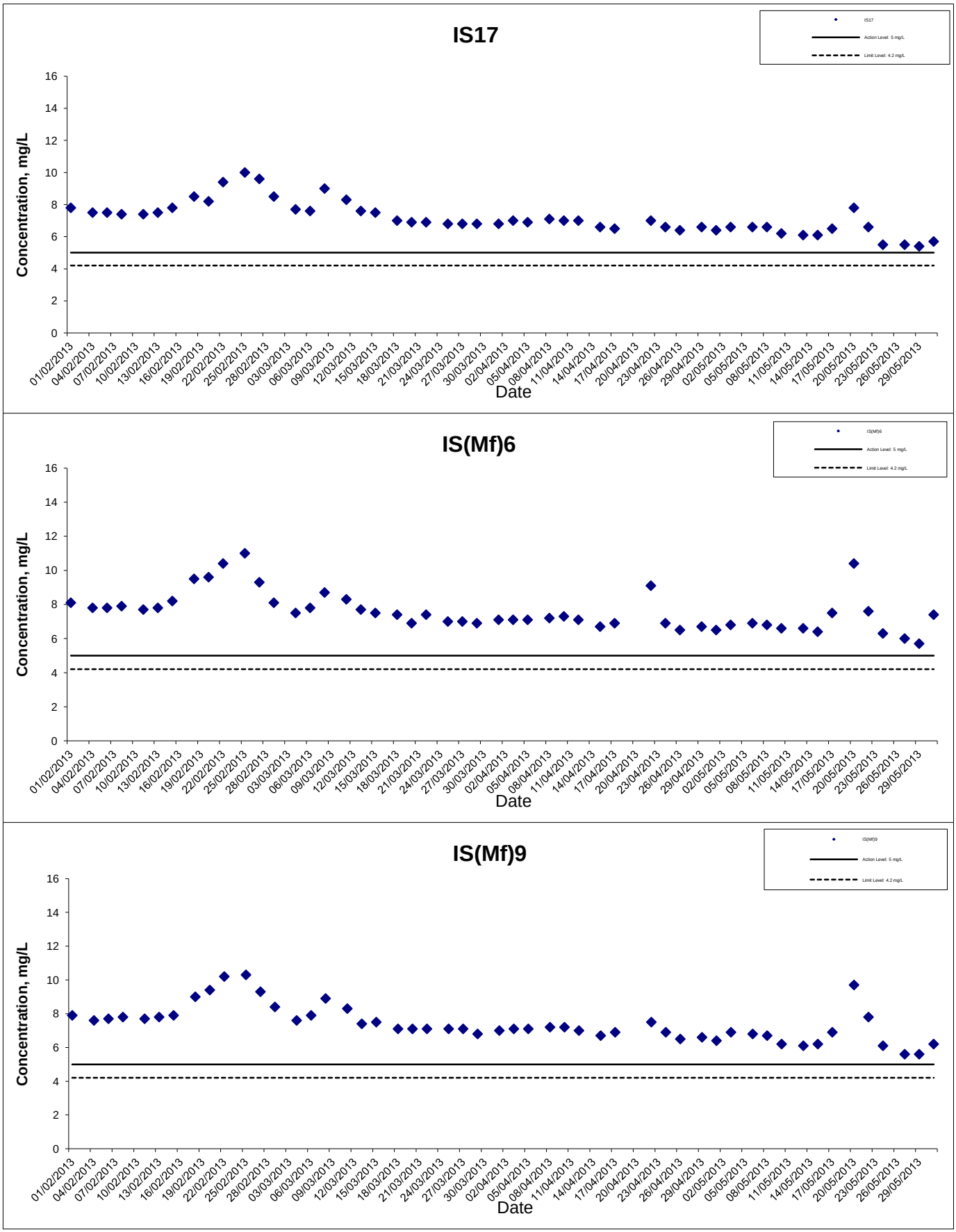
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



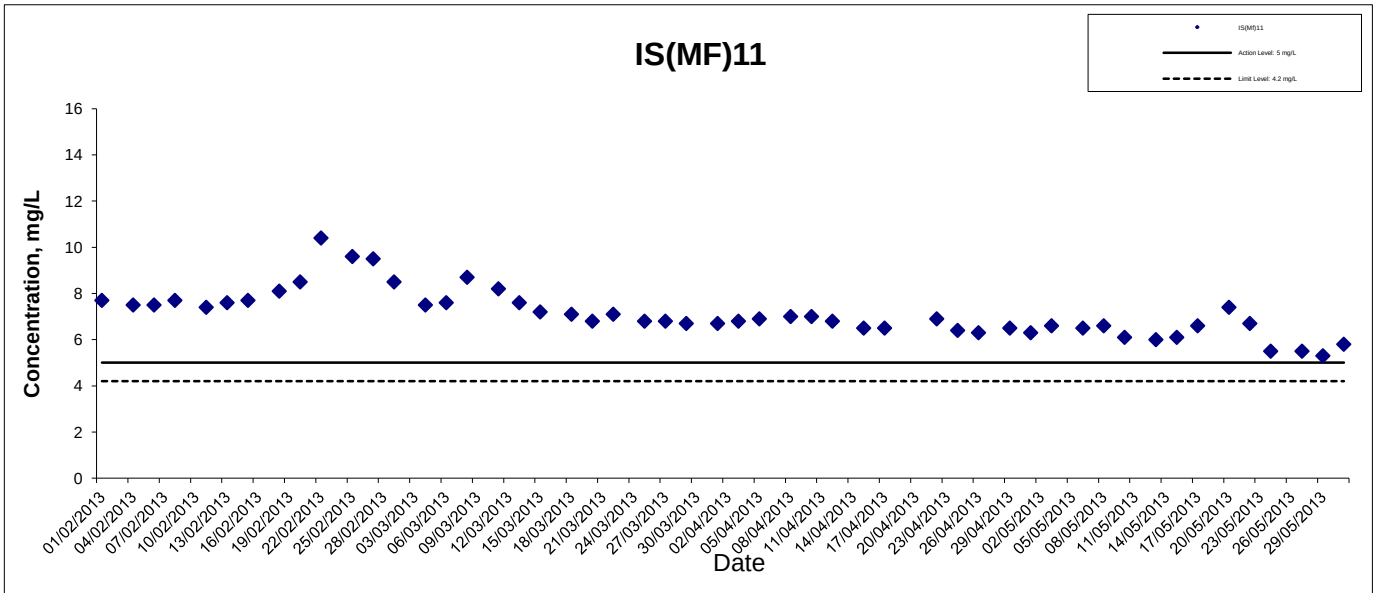


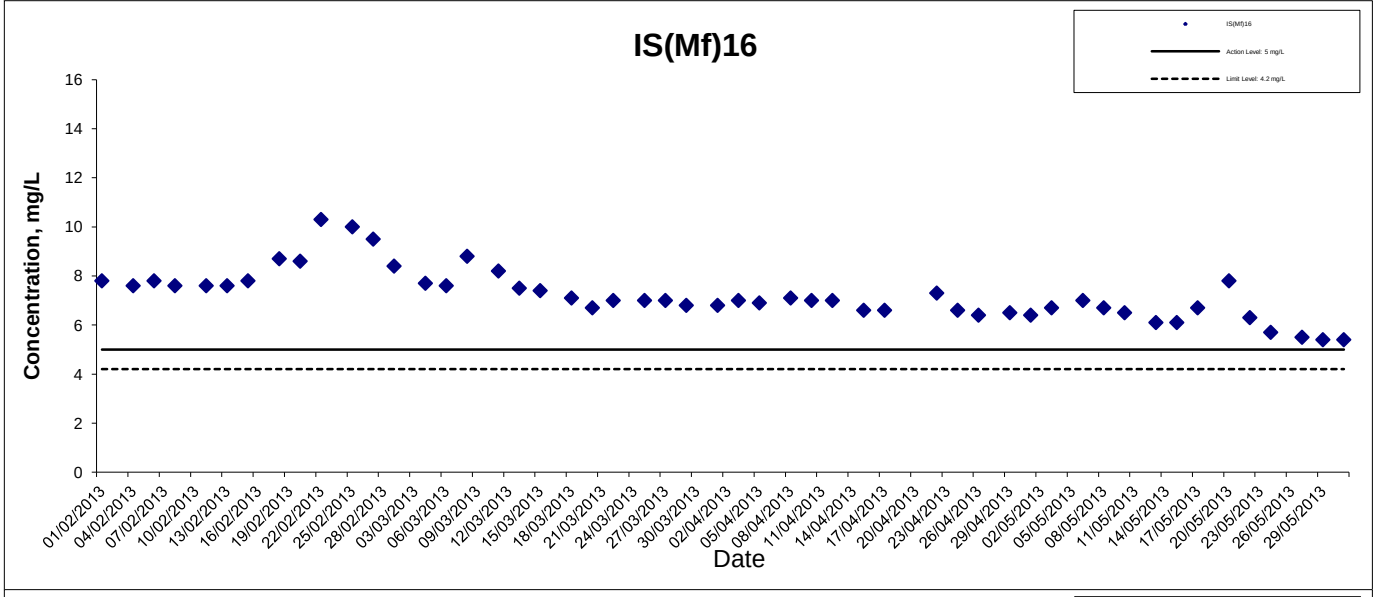


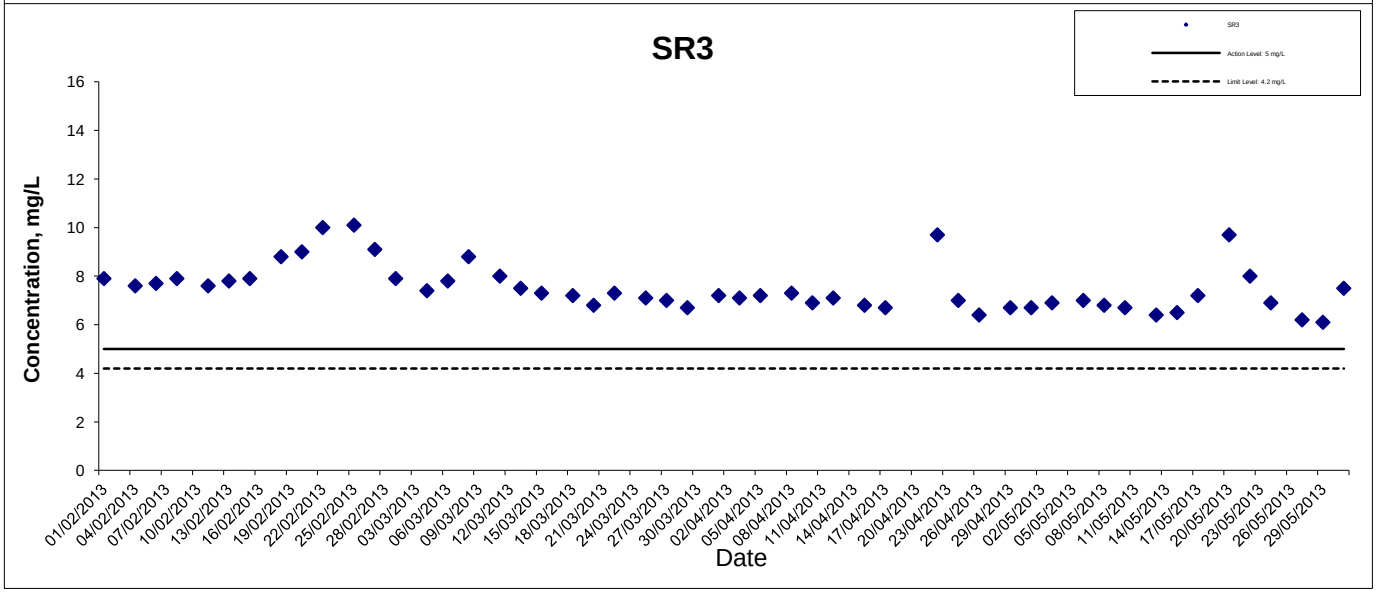
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide



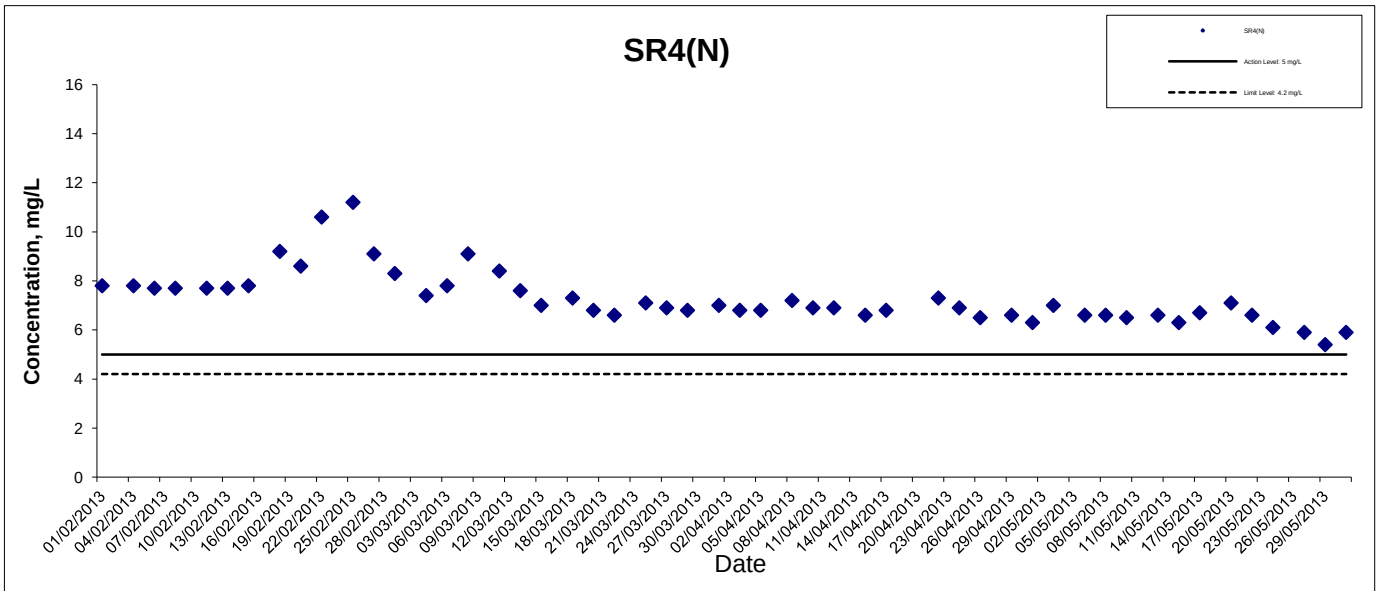
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide

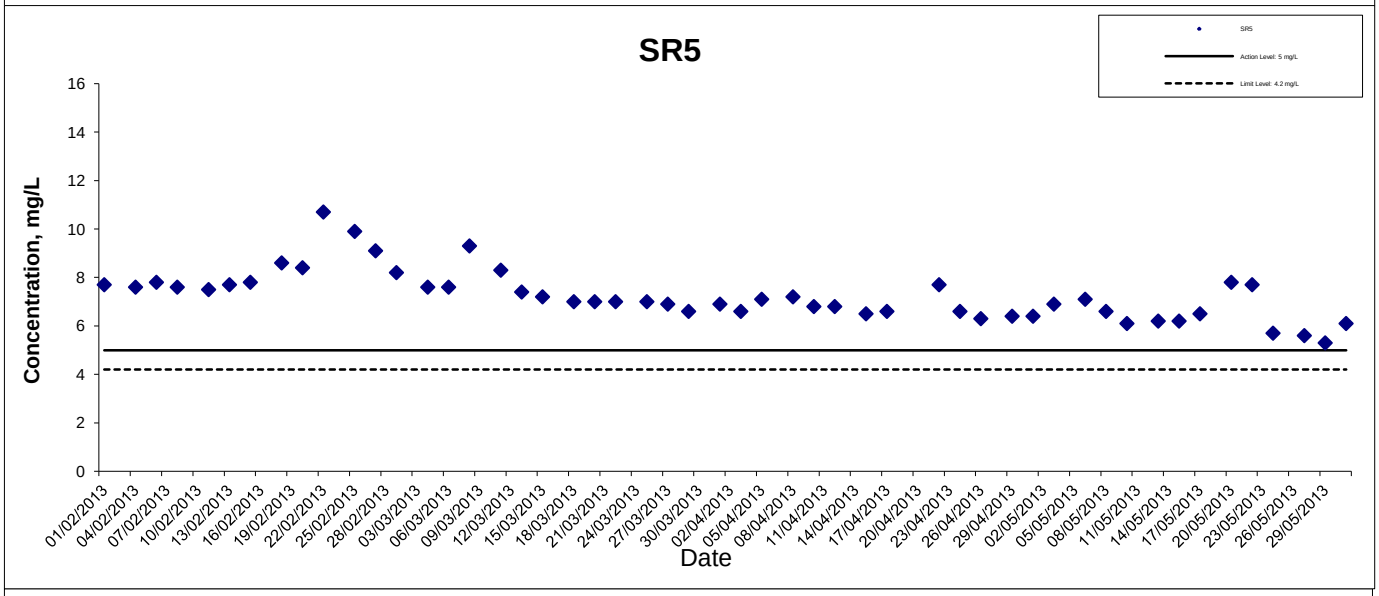


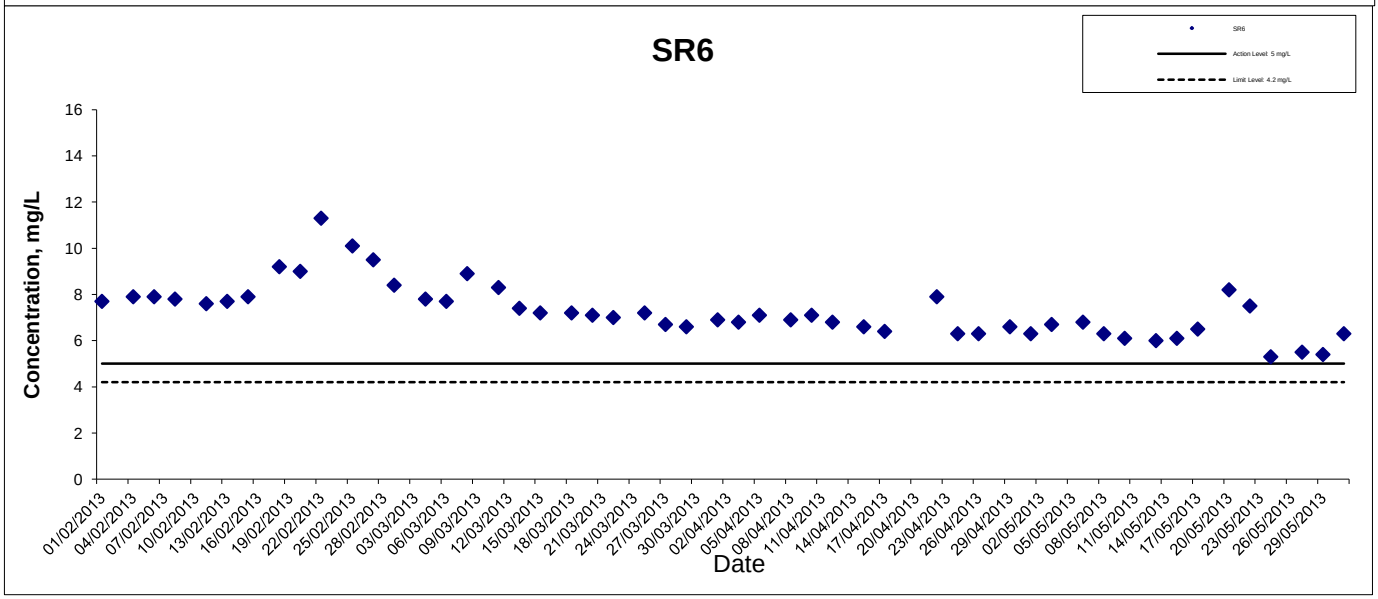




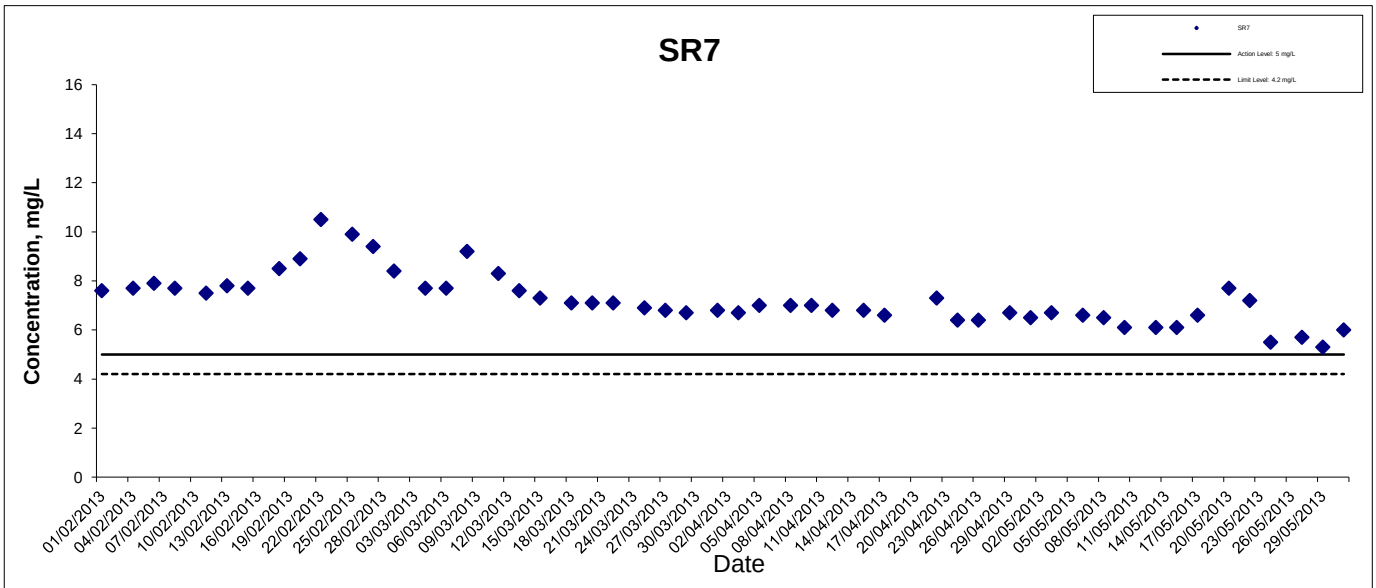
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide

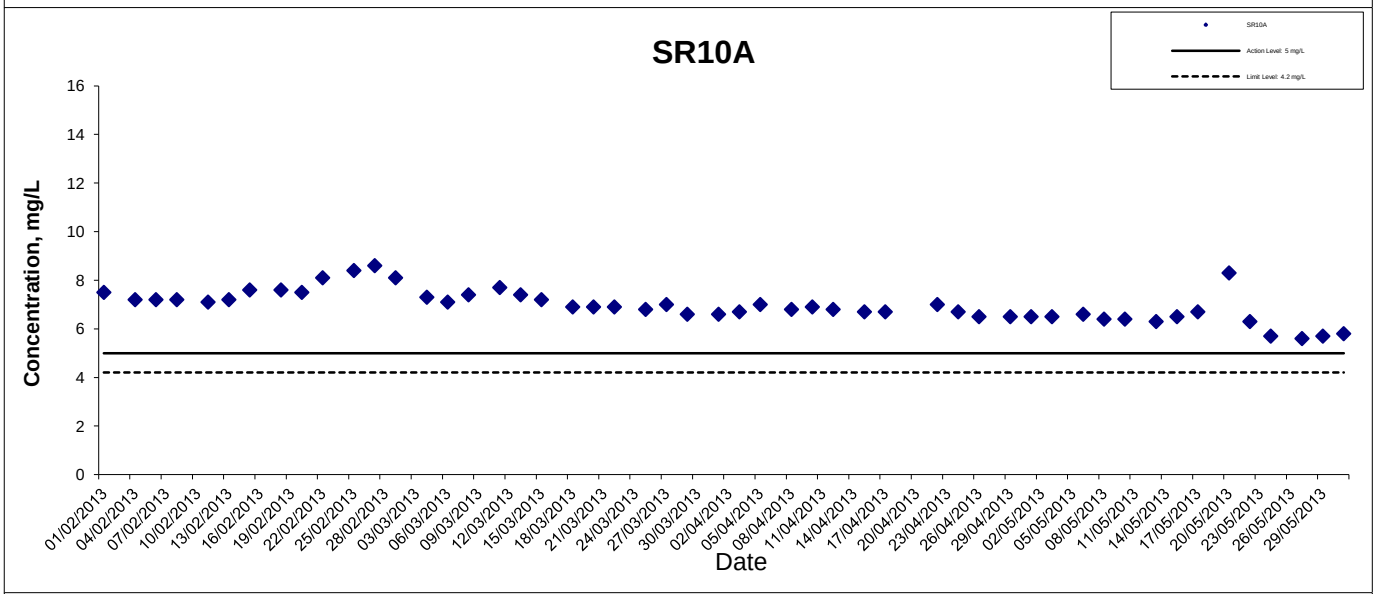


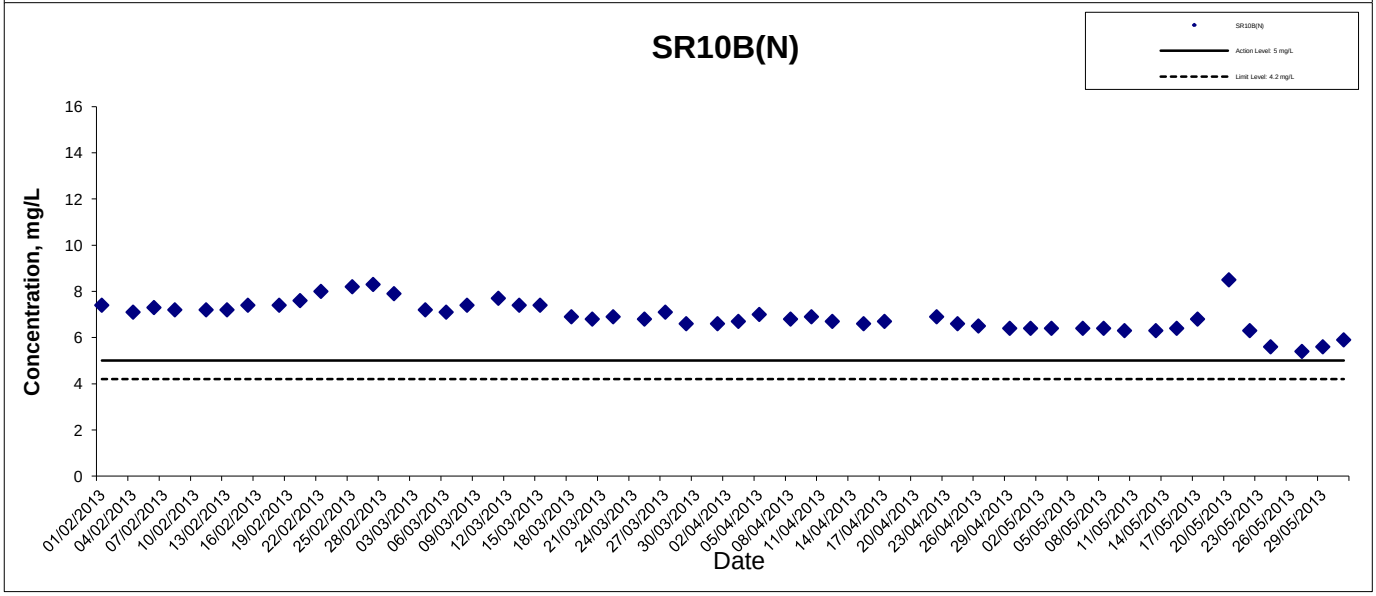




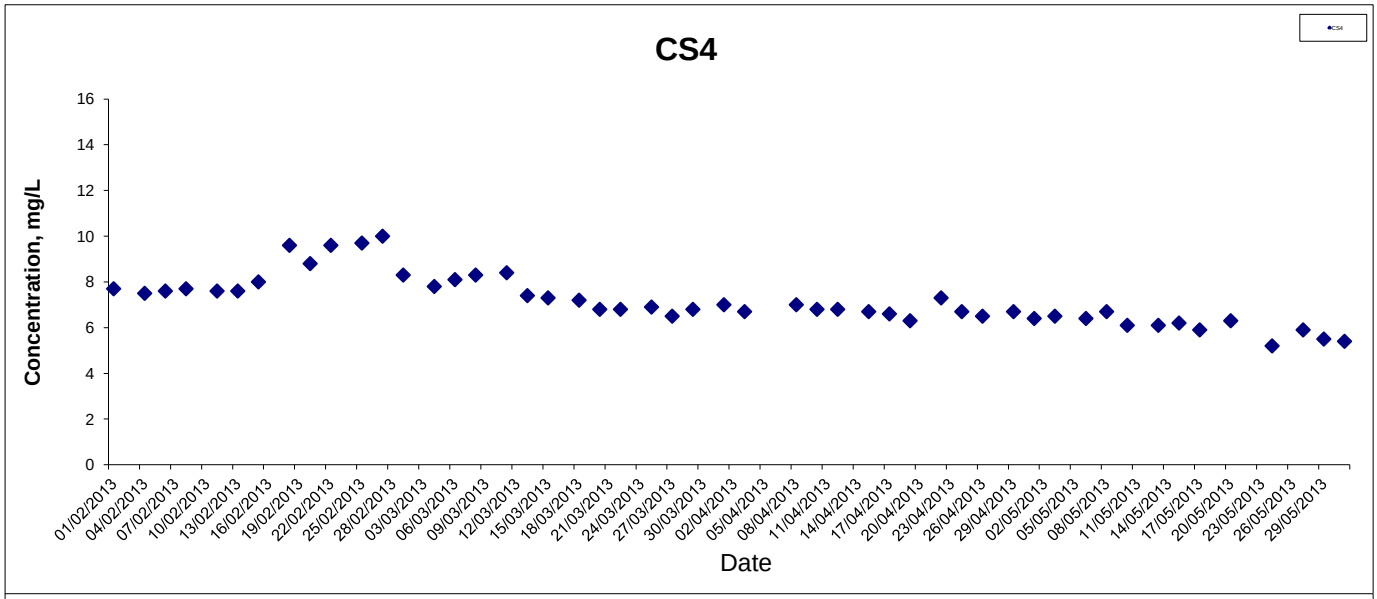
Dissolved Oxygen (Surface & Middle) at Mid-Flood Tide

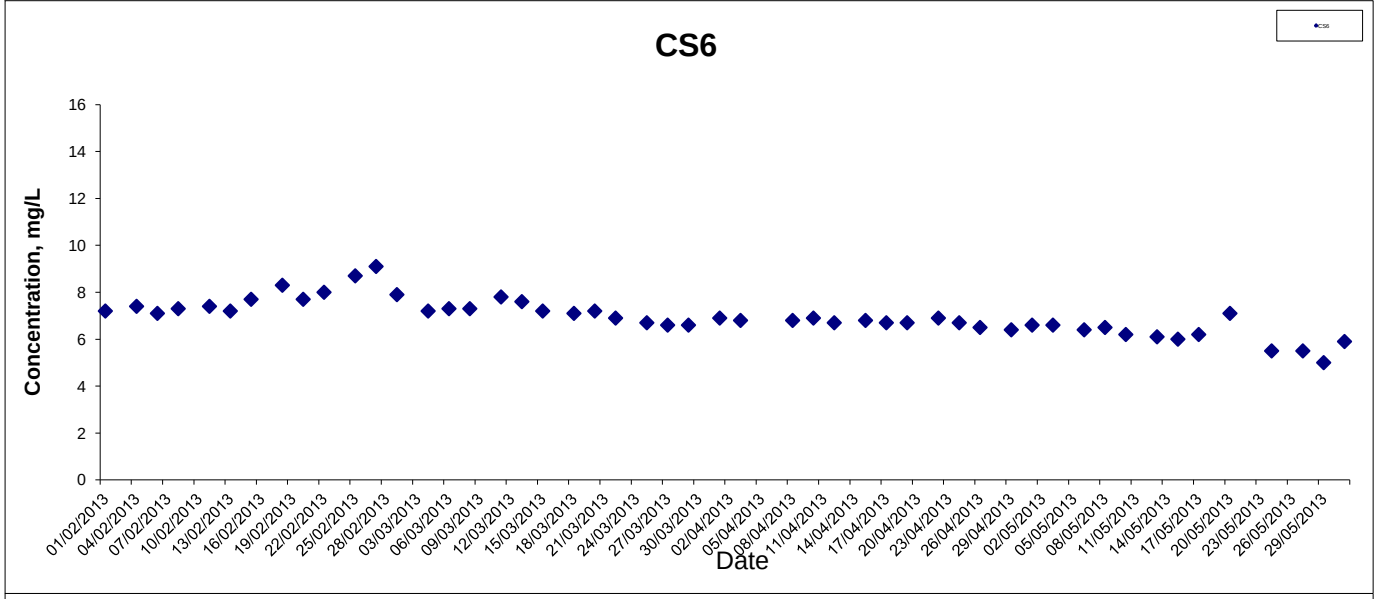


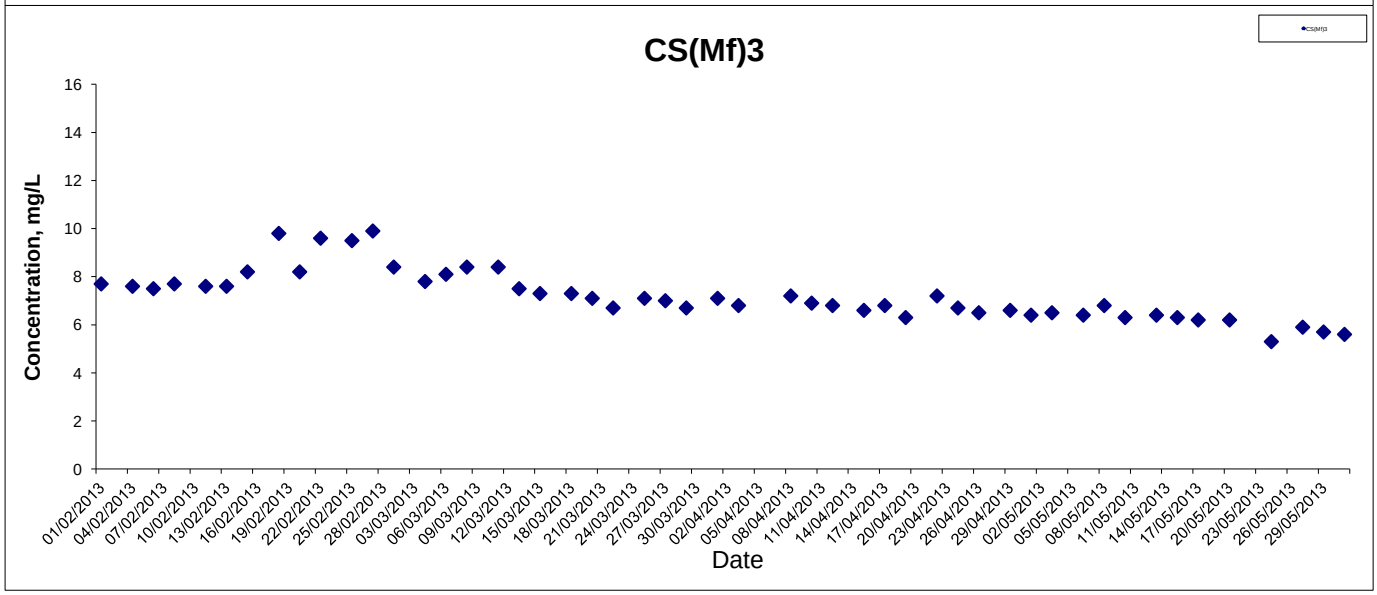




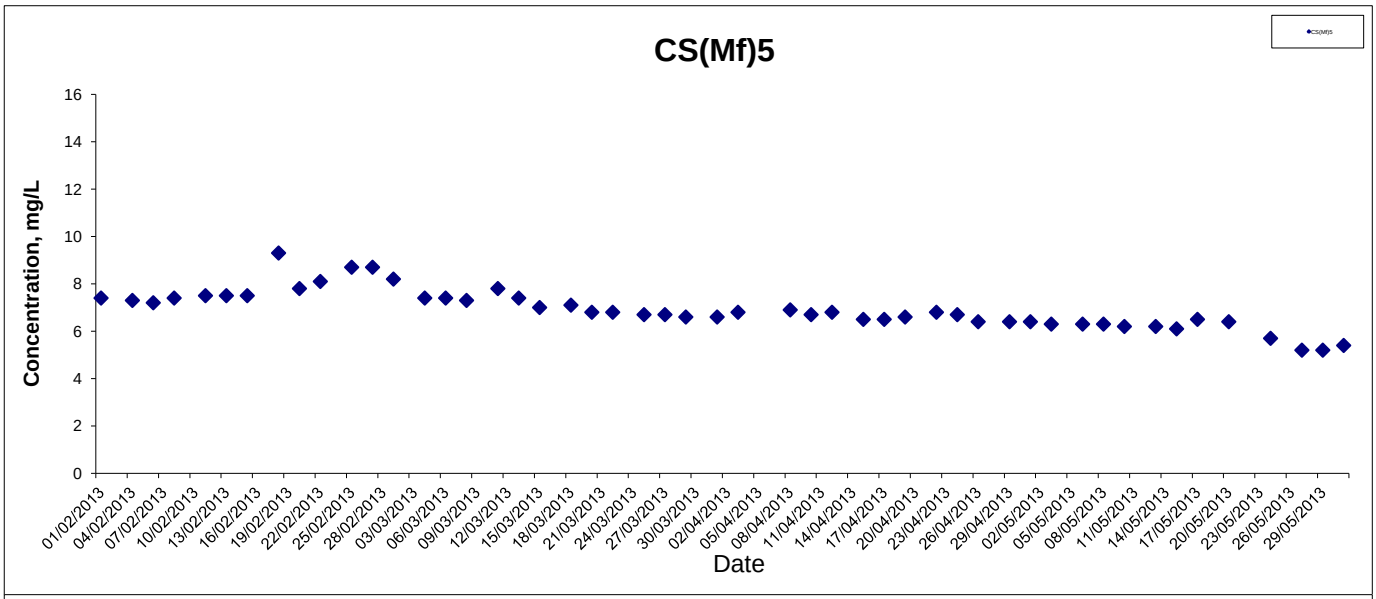
Dissolved Oxygen (Bottom) at Mid-Ebb Tide

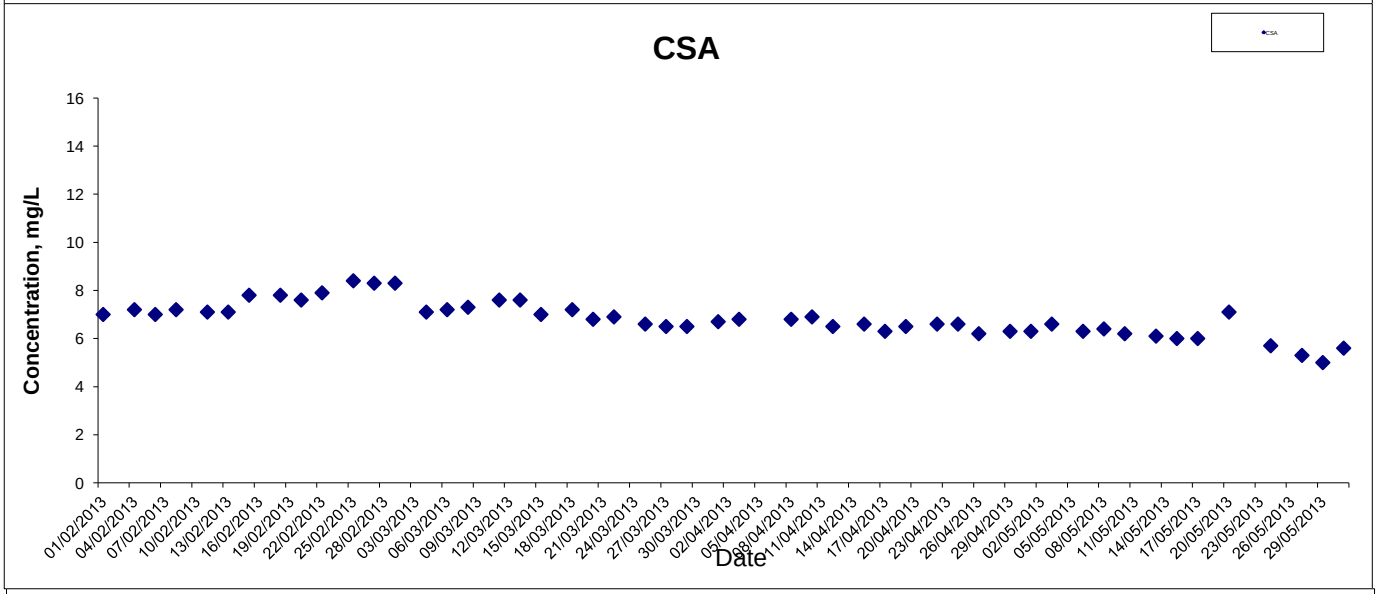


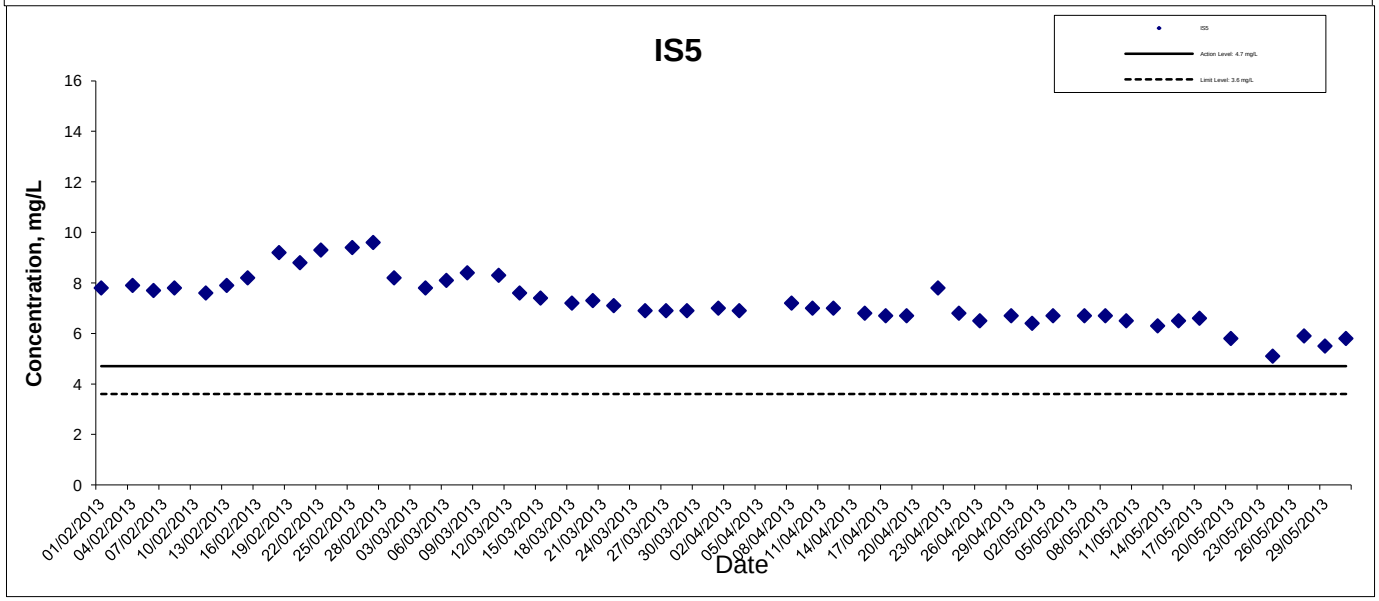




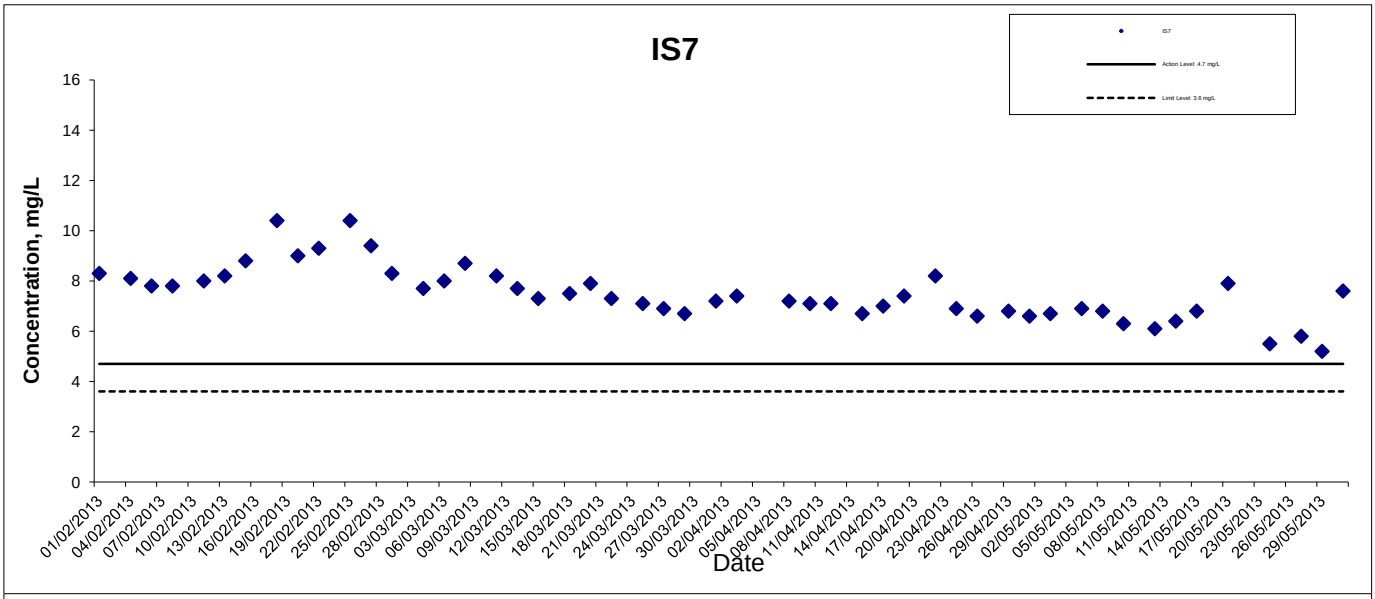
Dissolved Oxygen (Bottom) at Mid-Ebb Tide

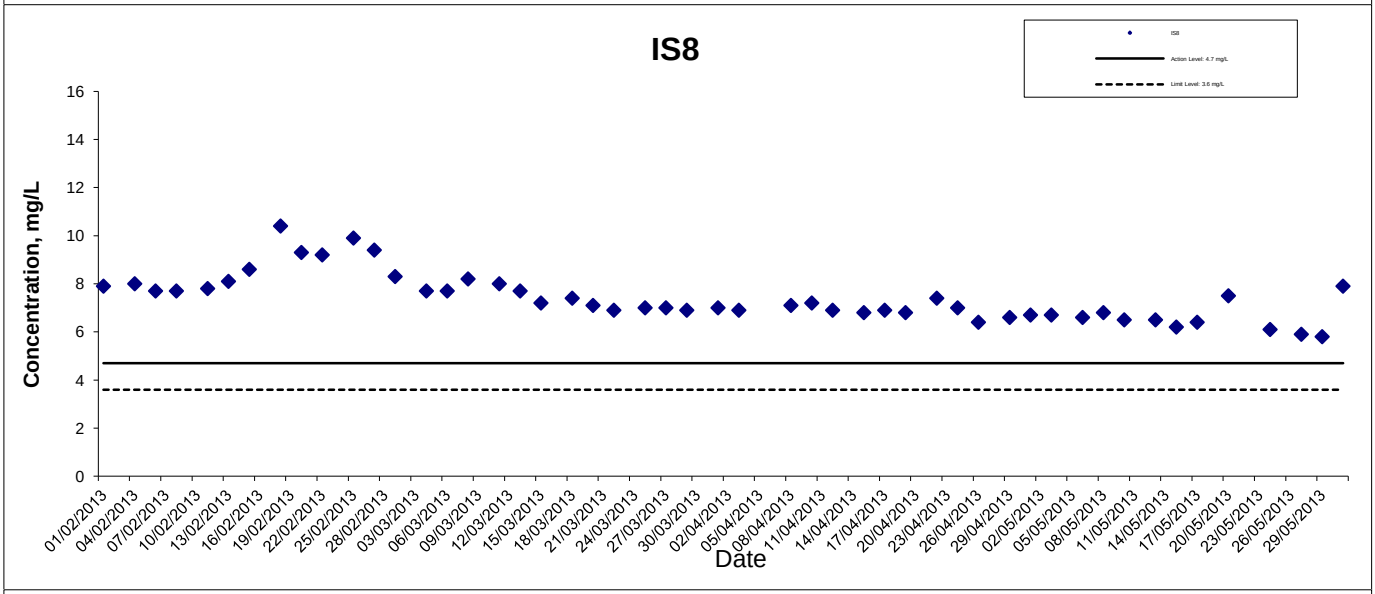


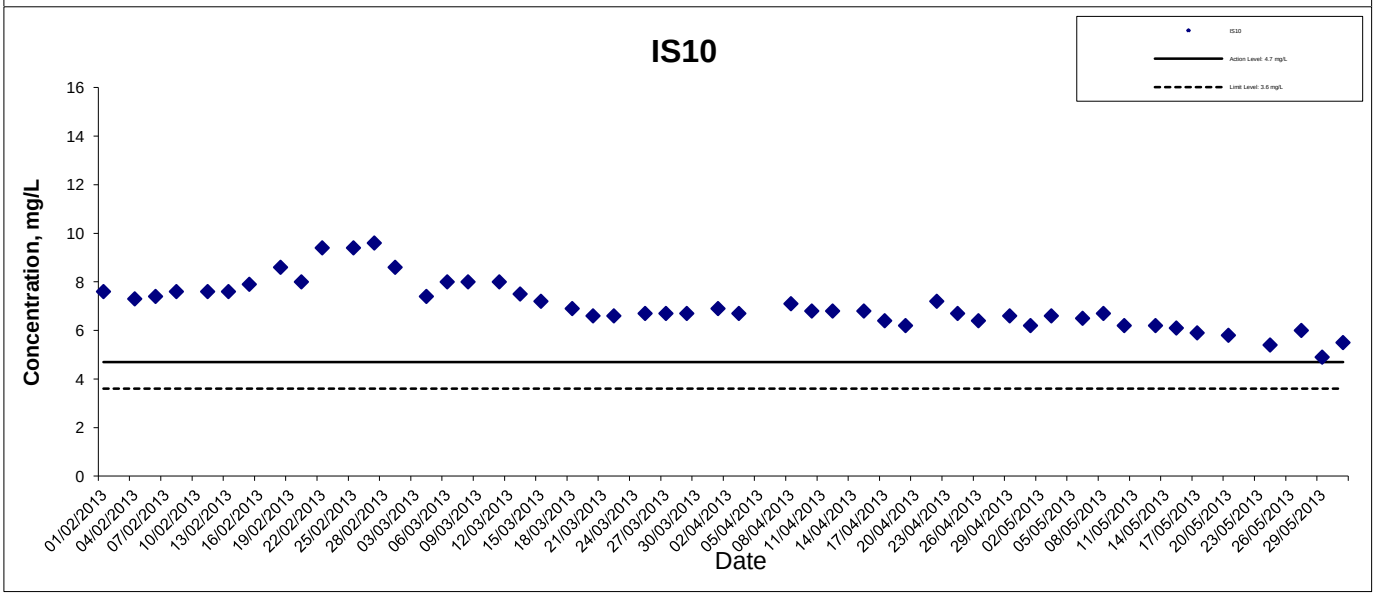




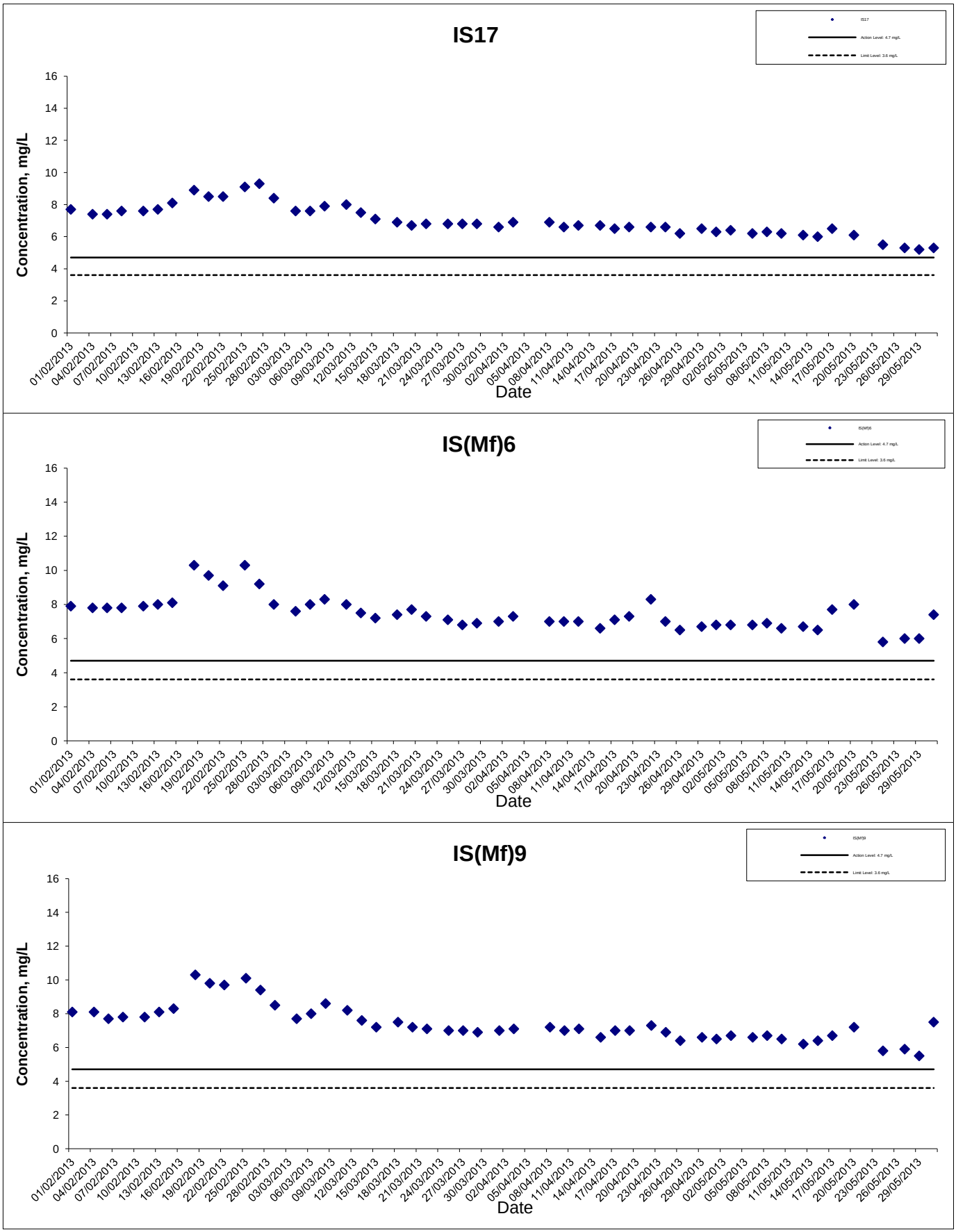
Dissolved Oxygen (Bottom) at Mid-Ebb Tide



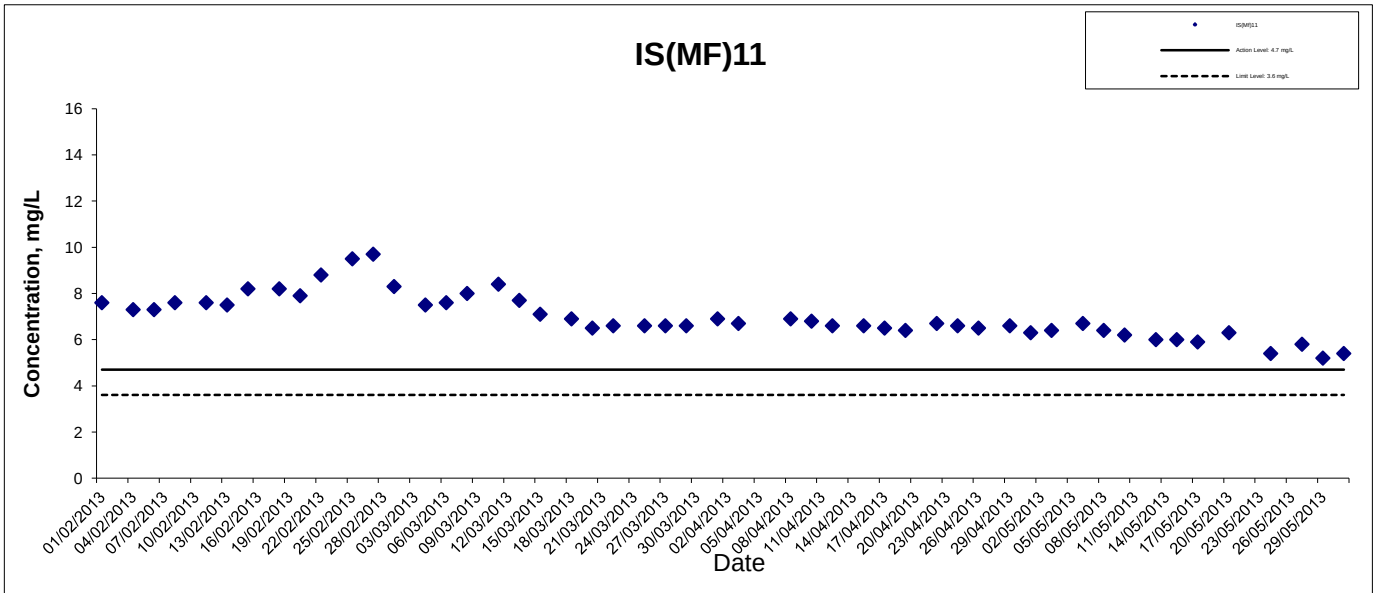


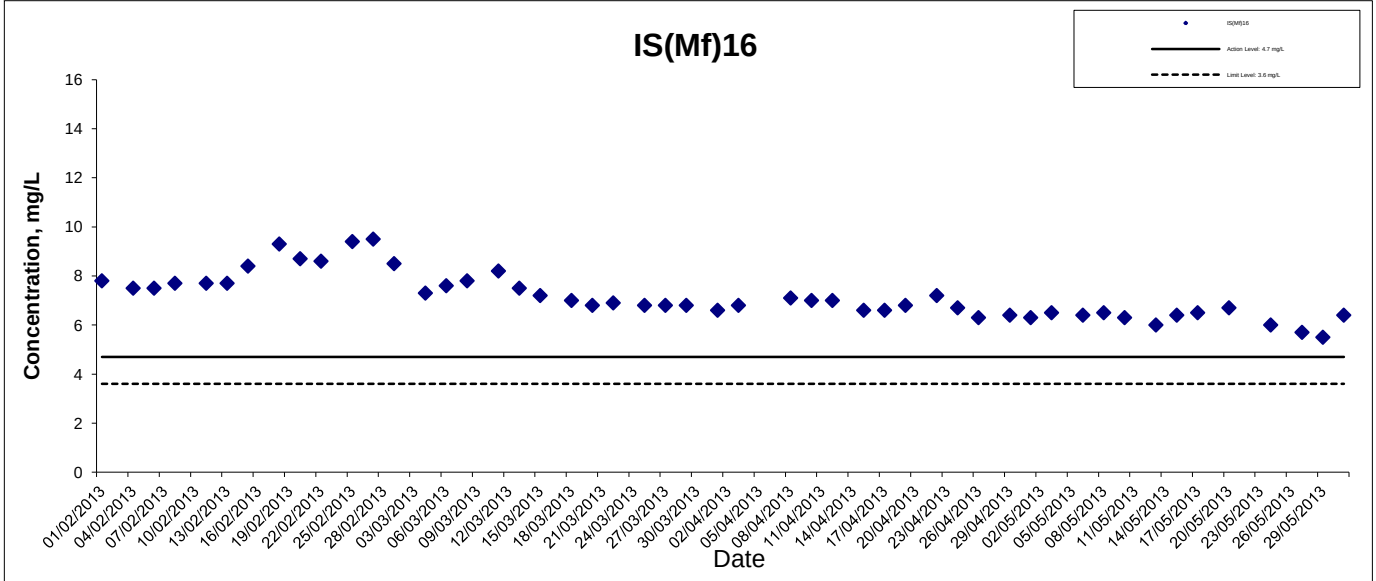


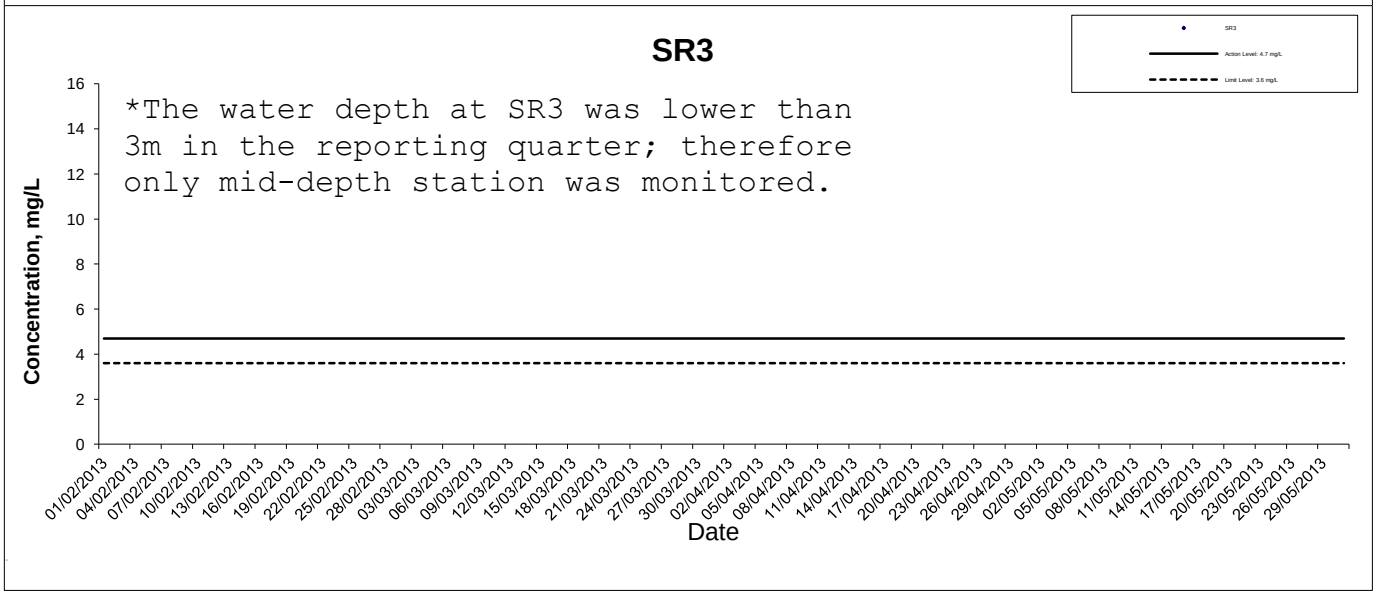
Dissolved Oxygen (Bottom) at Mid-Ebb Tide



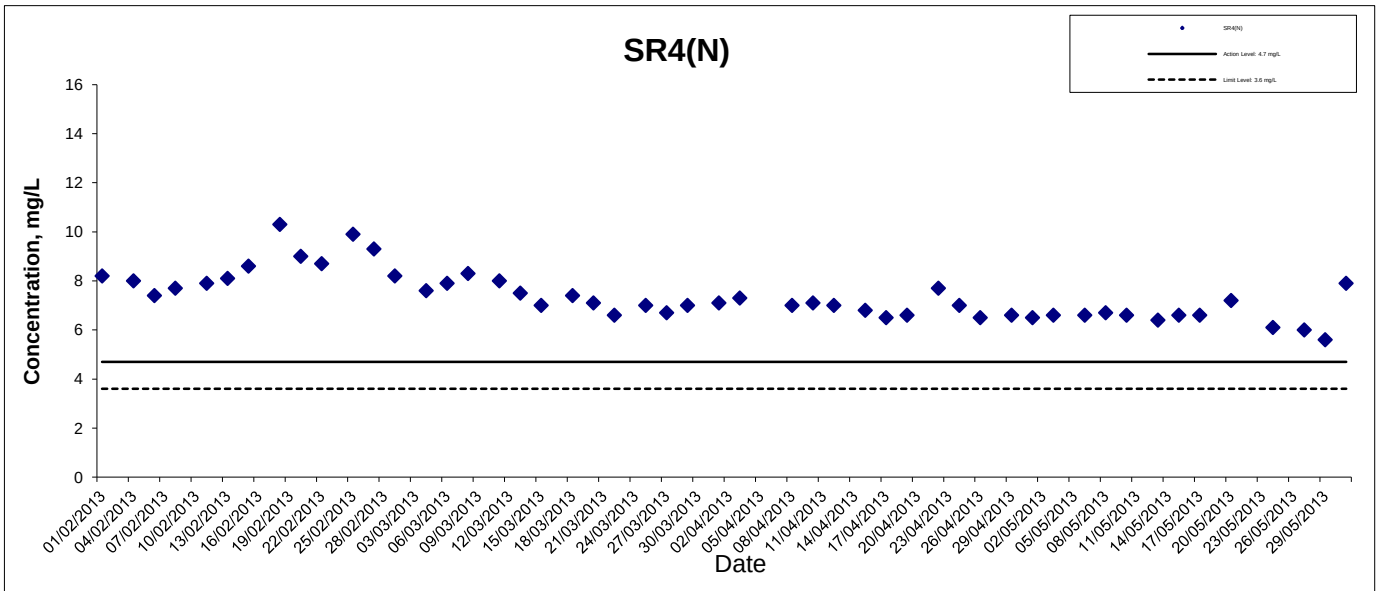
Dissolved Oxygen (Bottom) at Mid-Ebb Tide

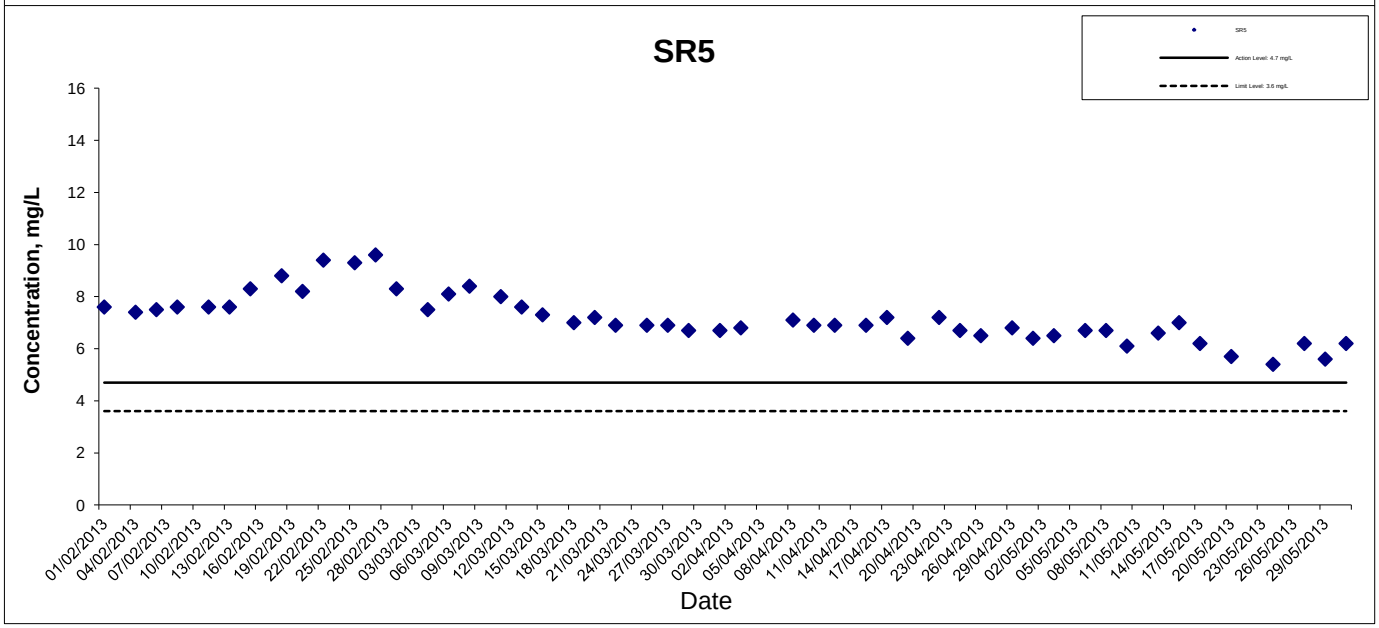


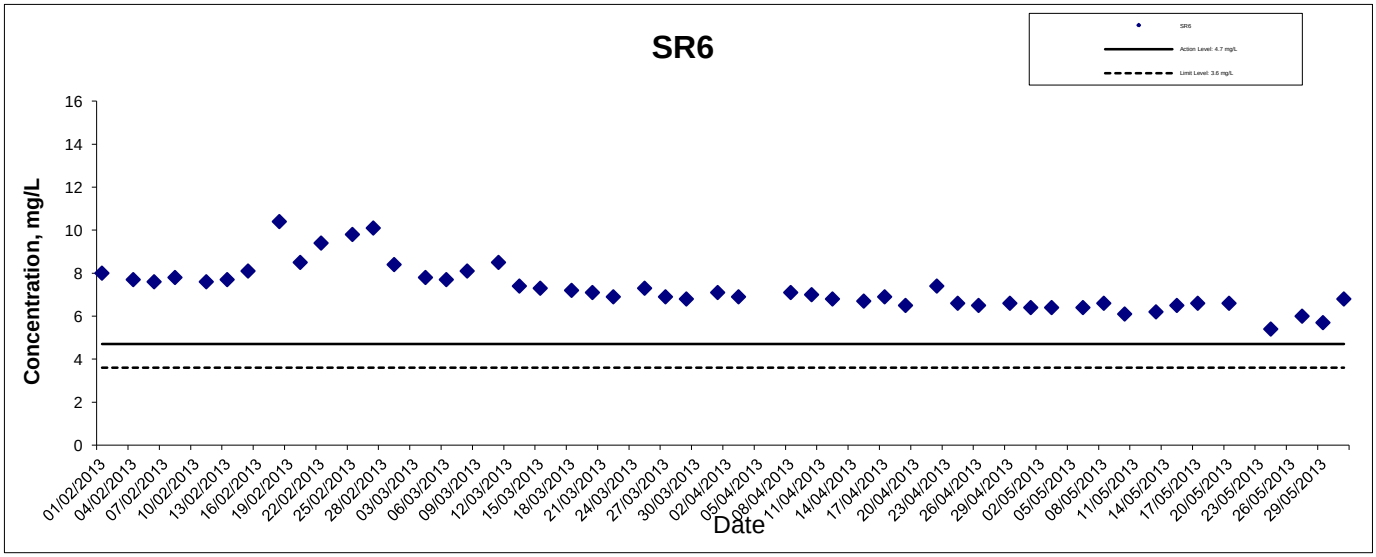




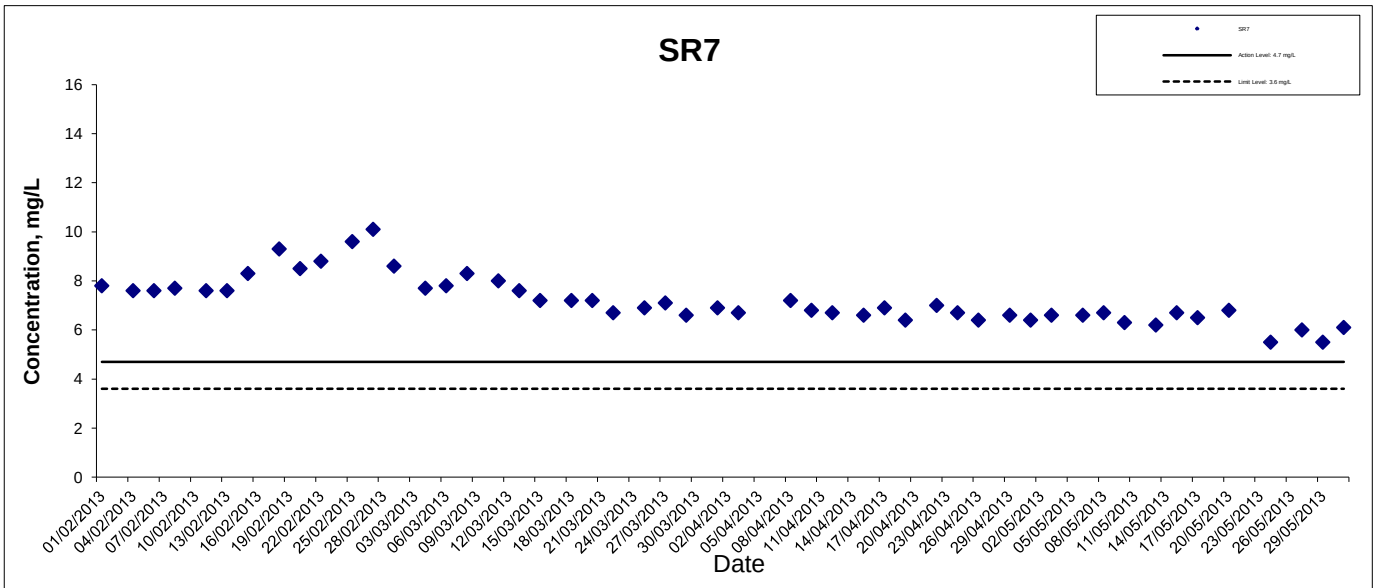
Dissolved Oxygen (Bottom) at Mid-Ebb Tide

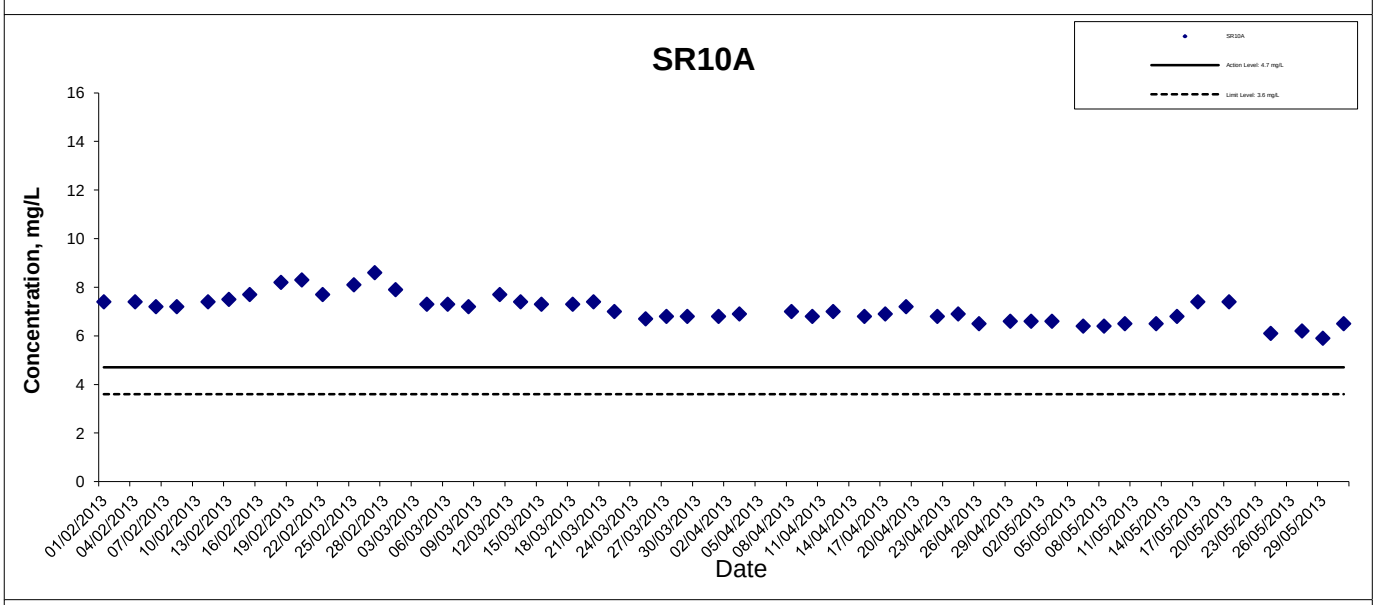


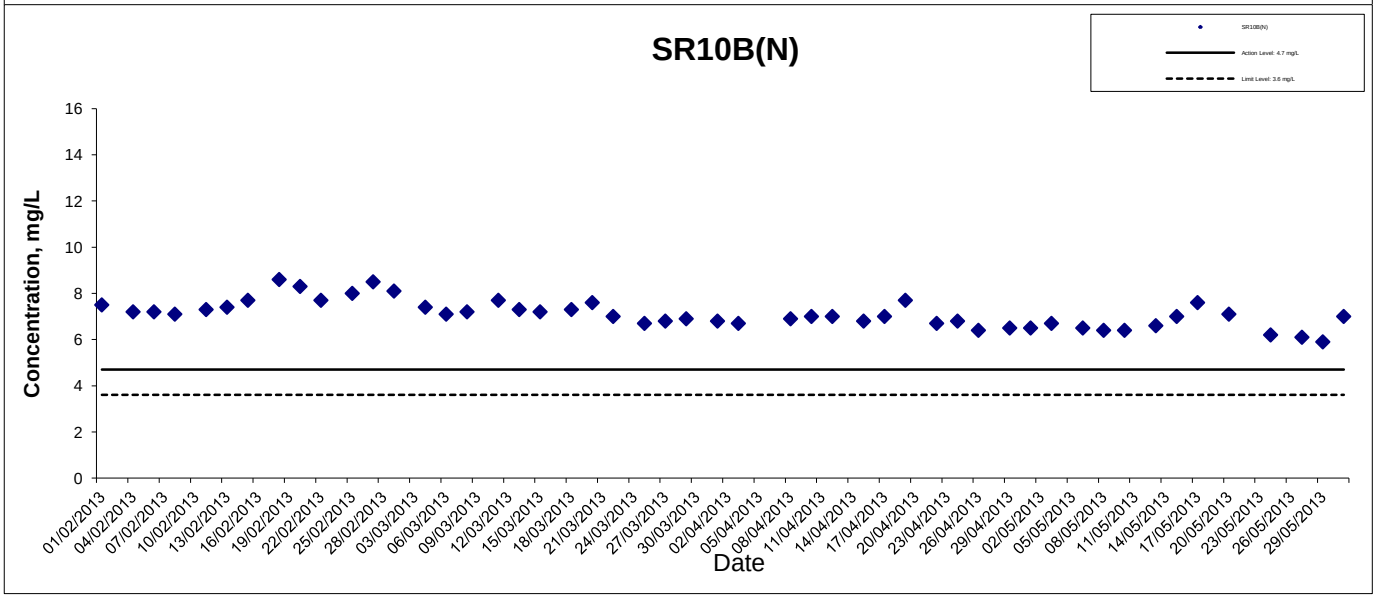




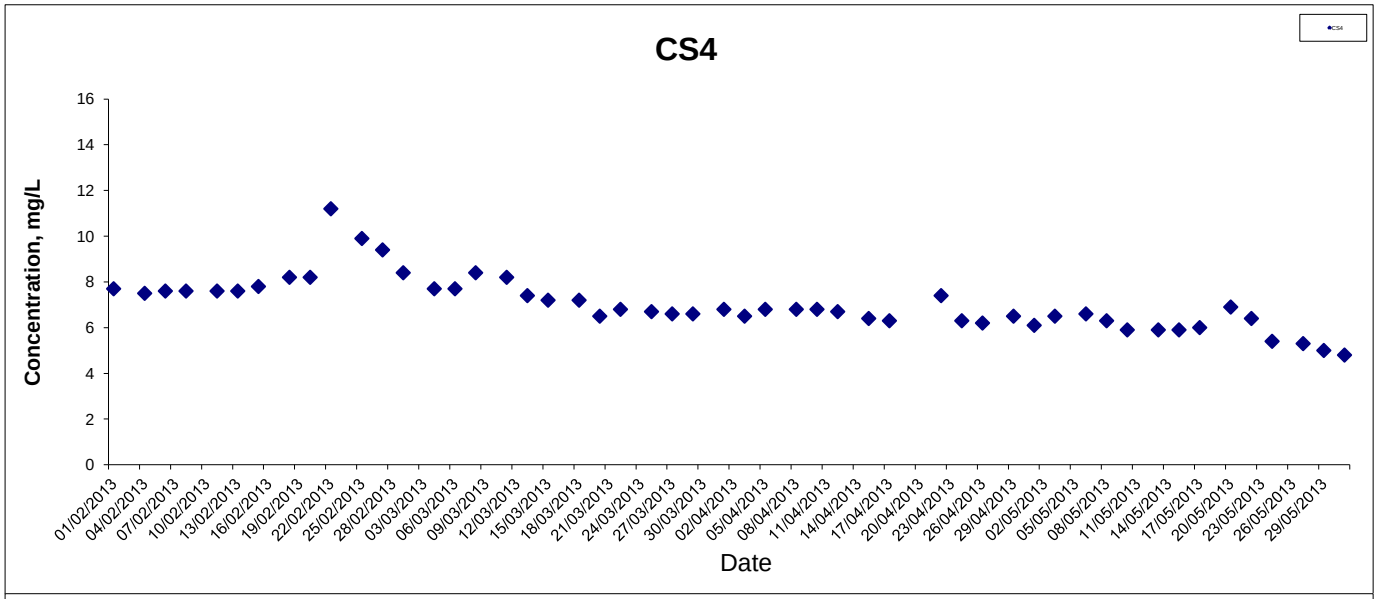
Dissolved Oxygen (Bottom) at Mid-Ebb Tide

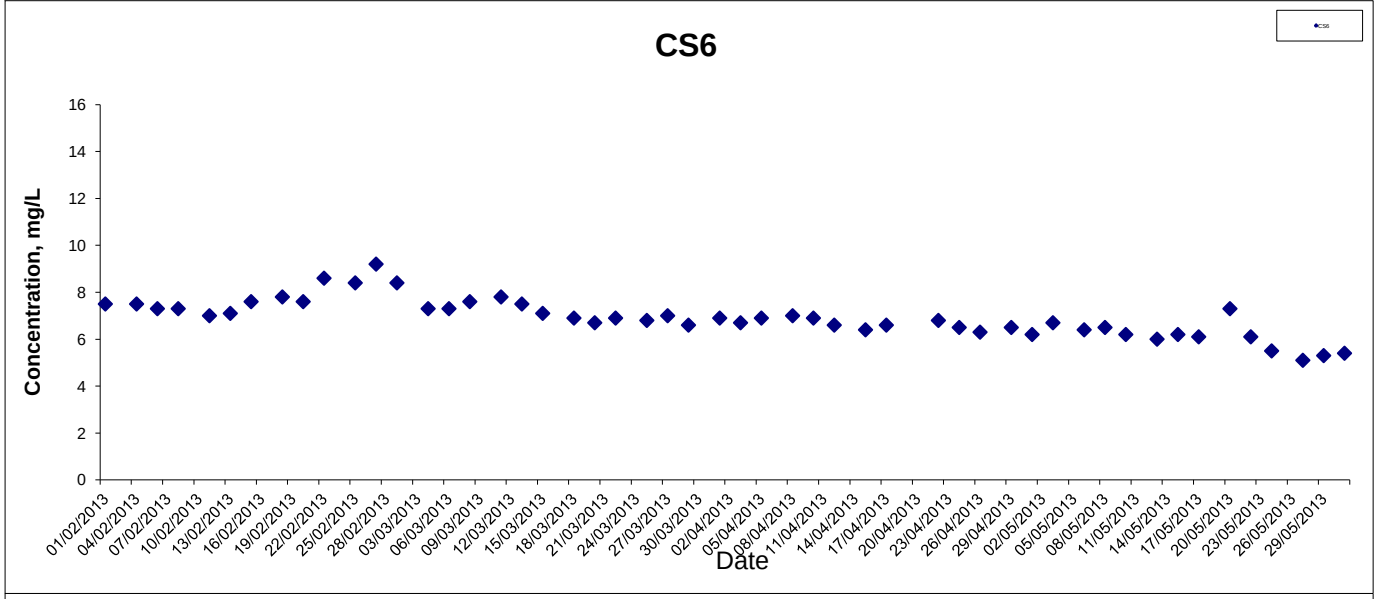


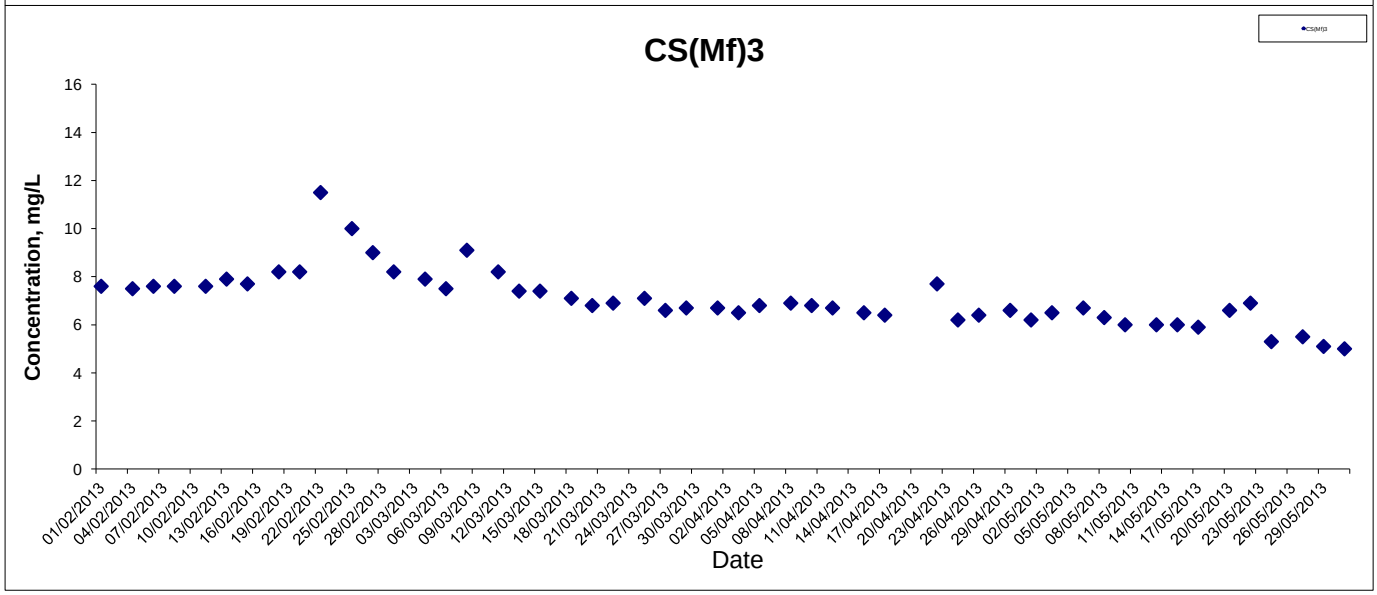




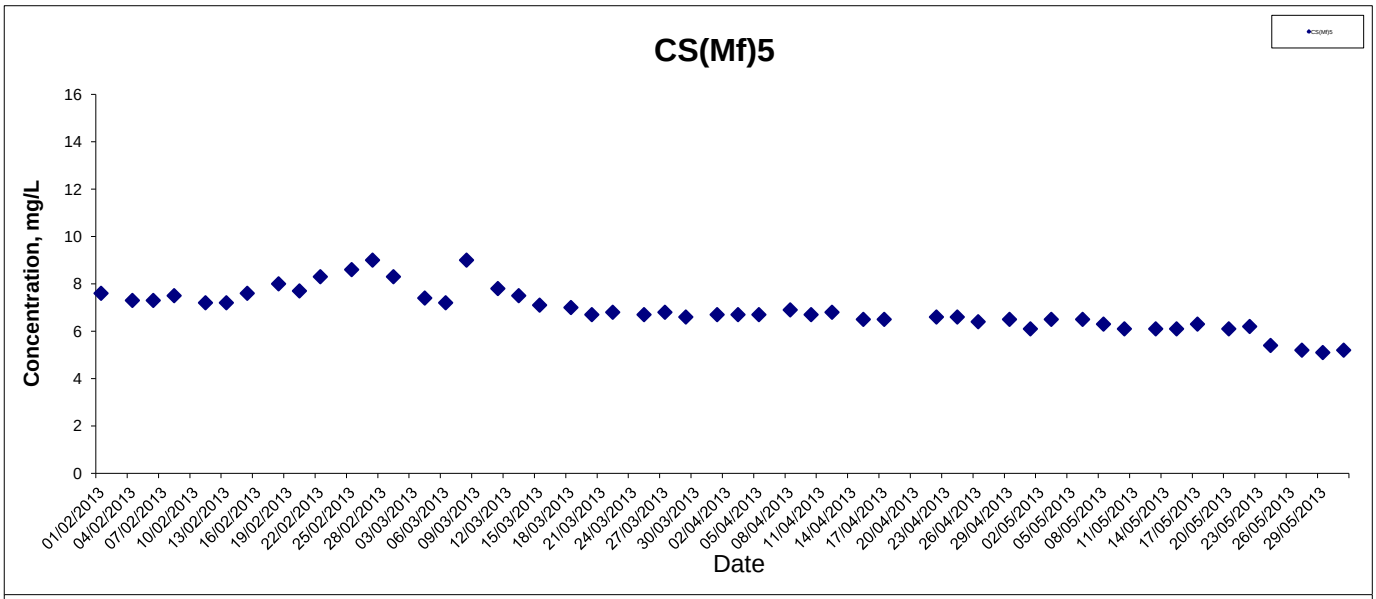
Dissolved Oxygen (Bottom) at Mid-Flood Tide

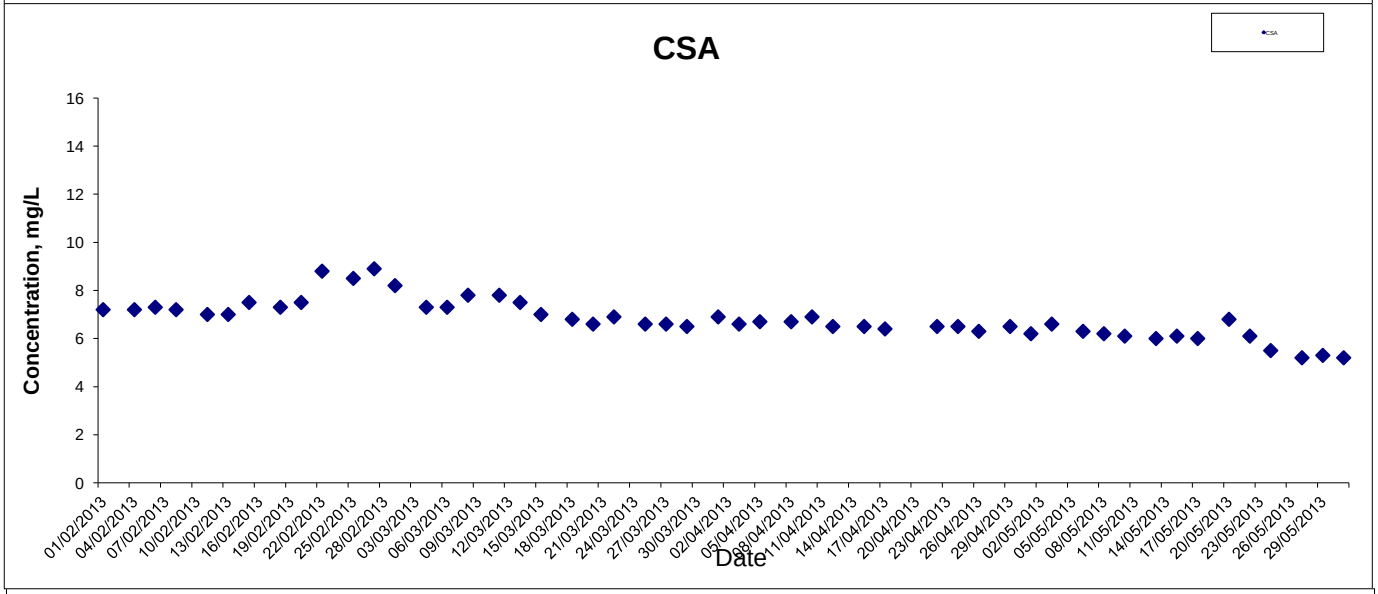


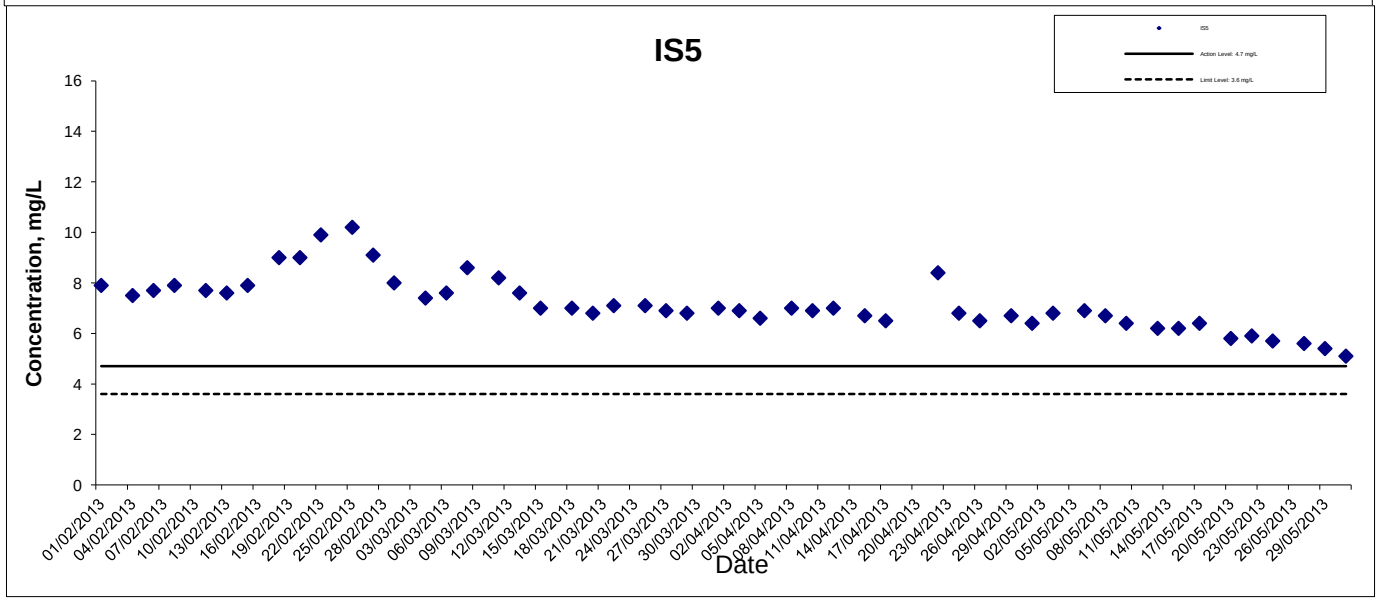




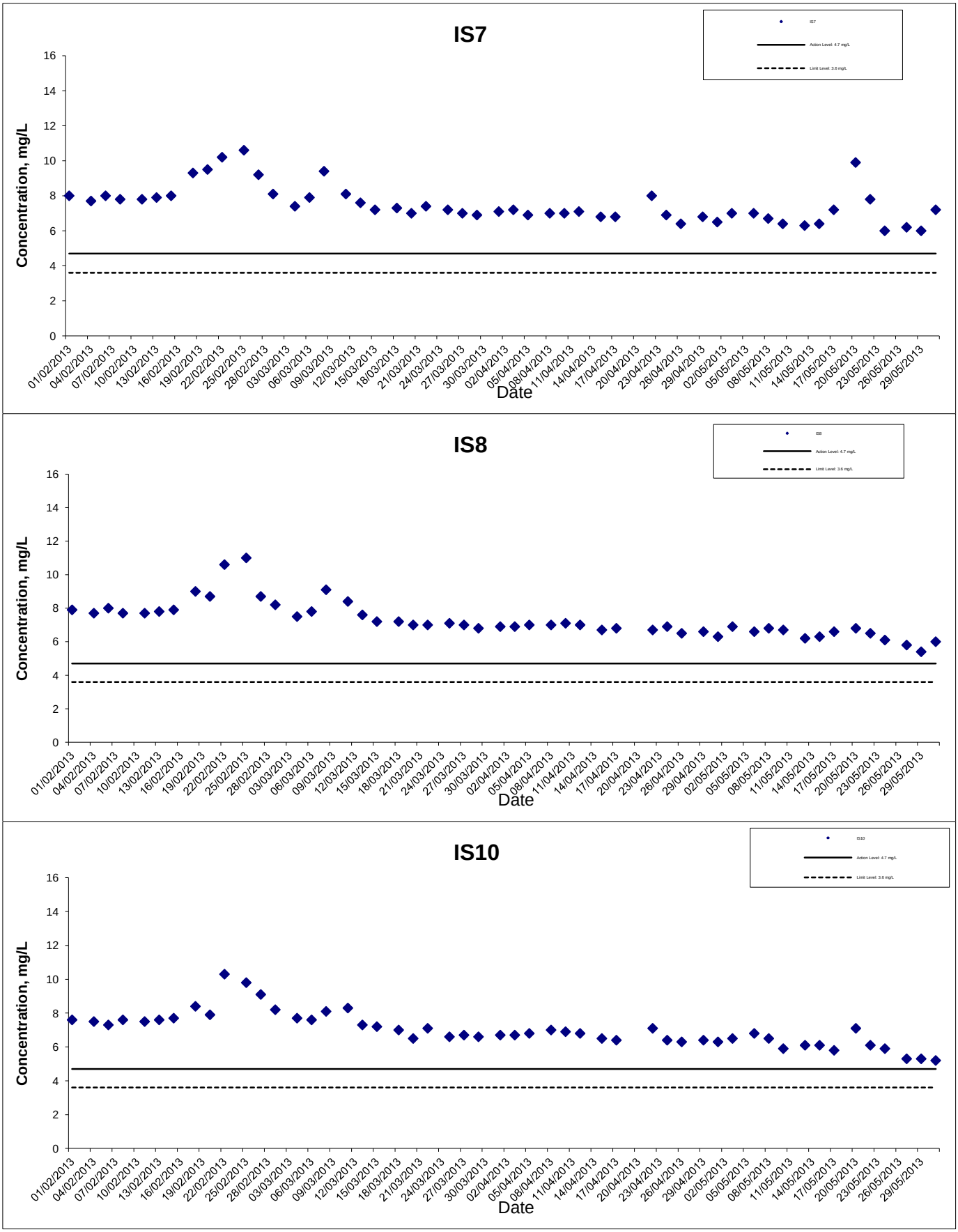
Dissolved Oxygen (Bottom) at Mid-Flood Tide



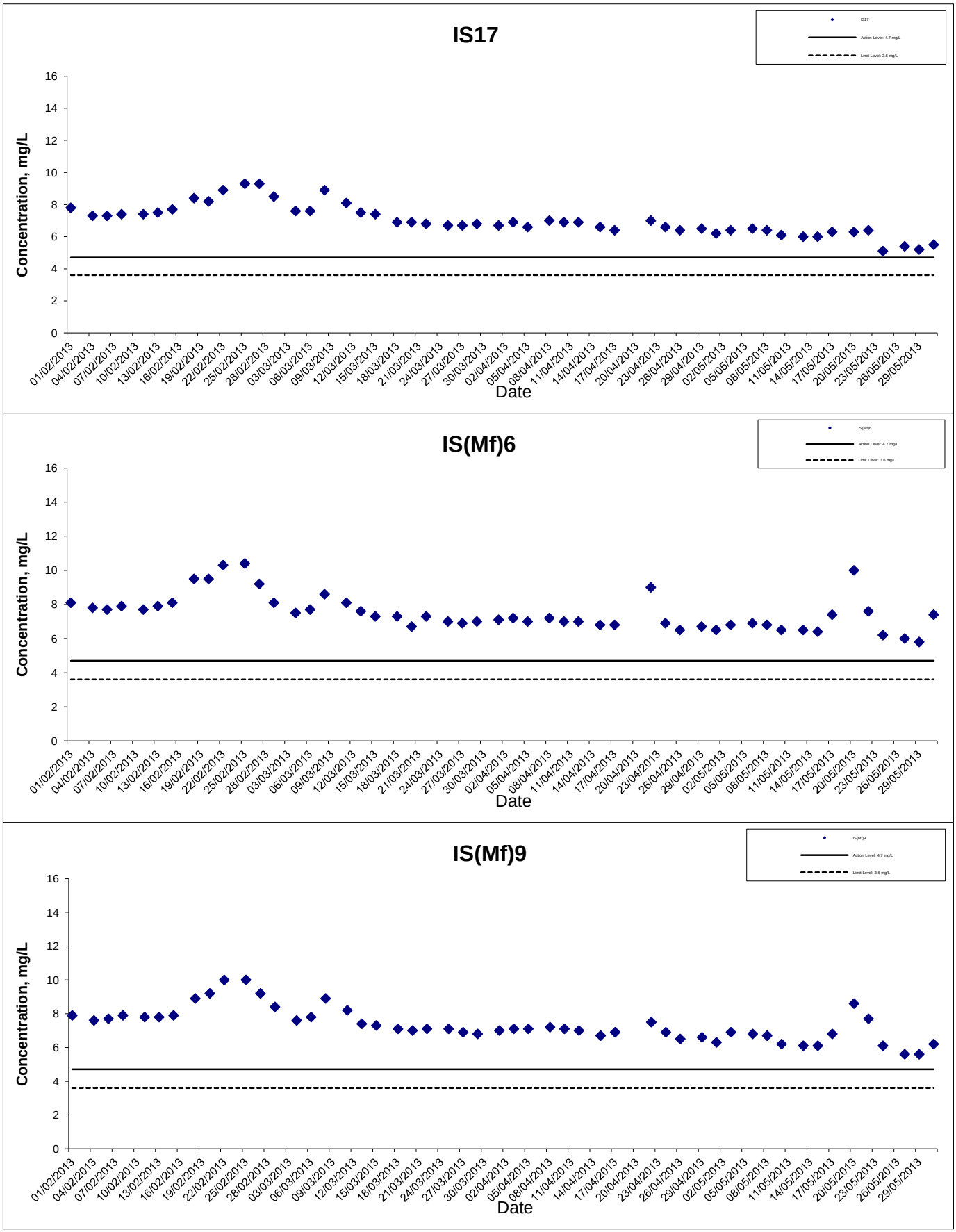




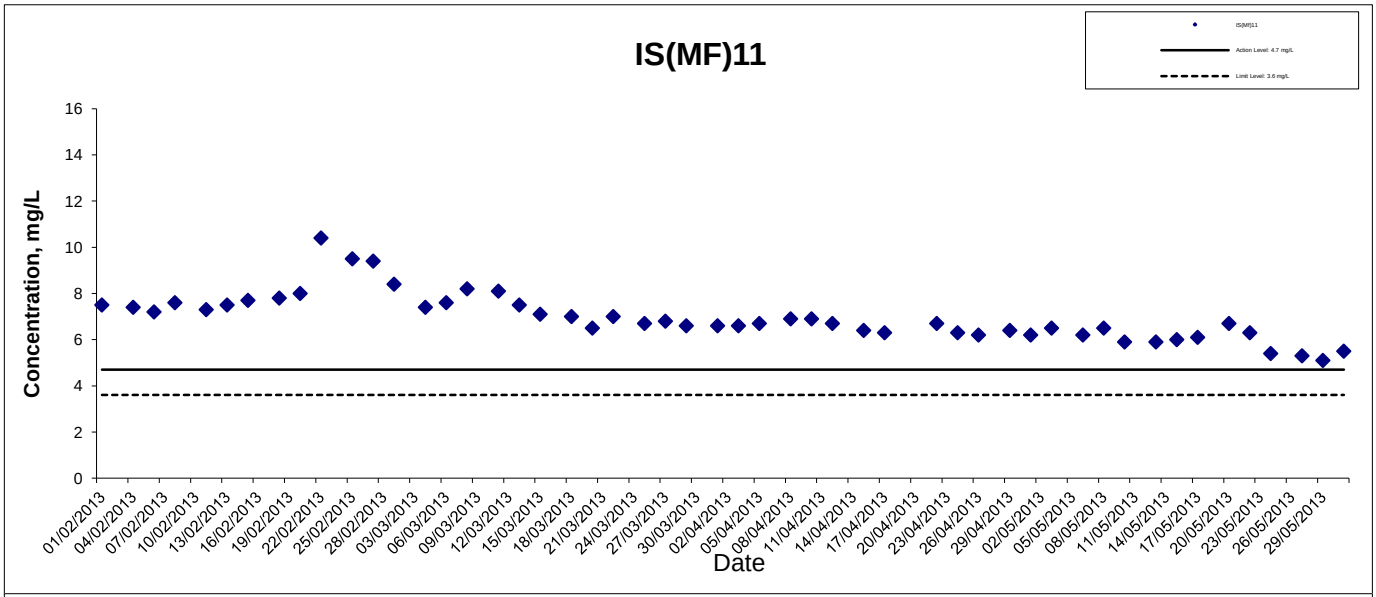
Dissolved Oxygen (Bottom) at Mid-Flood Tide

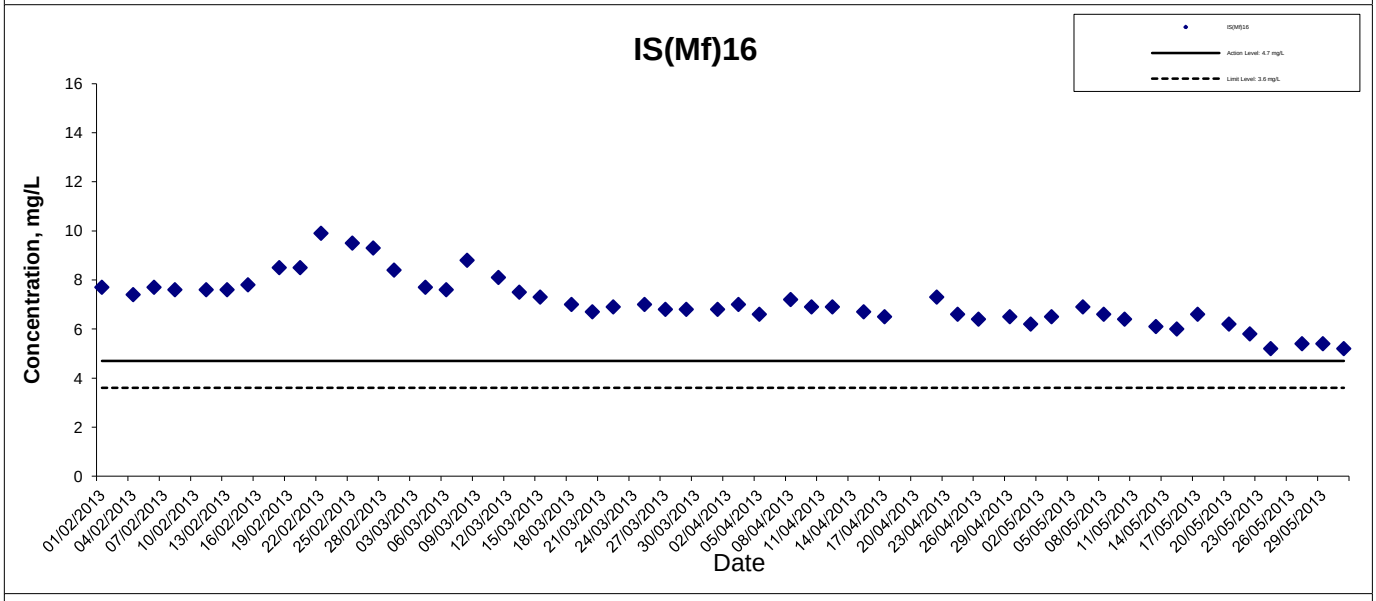


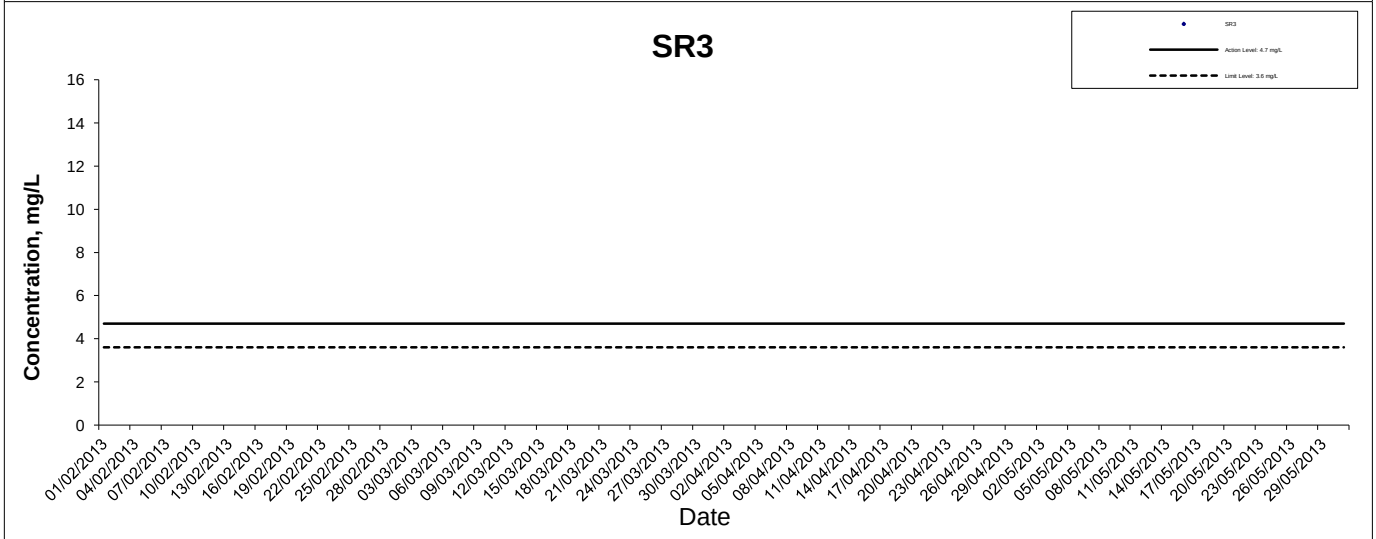
Dissolved Oxygen (Bottom) at Mid-Flood Tide



Dissolved Oxygen (Bottom) at Mid-Flood Tide

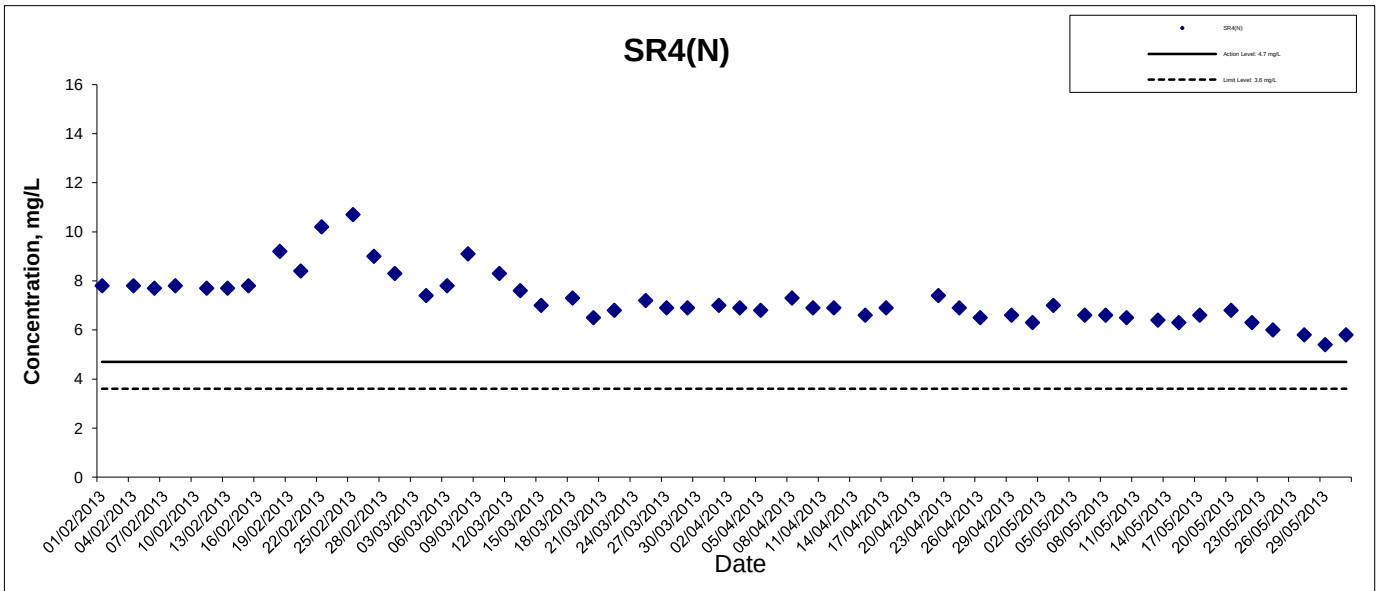


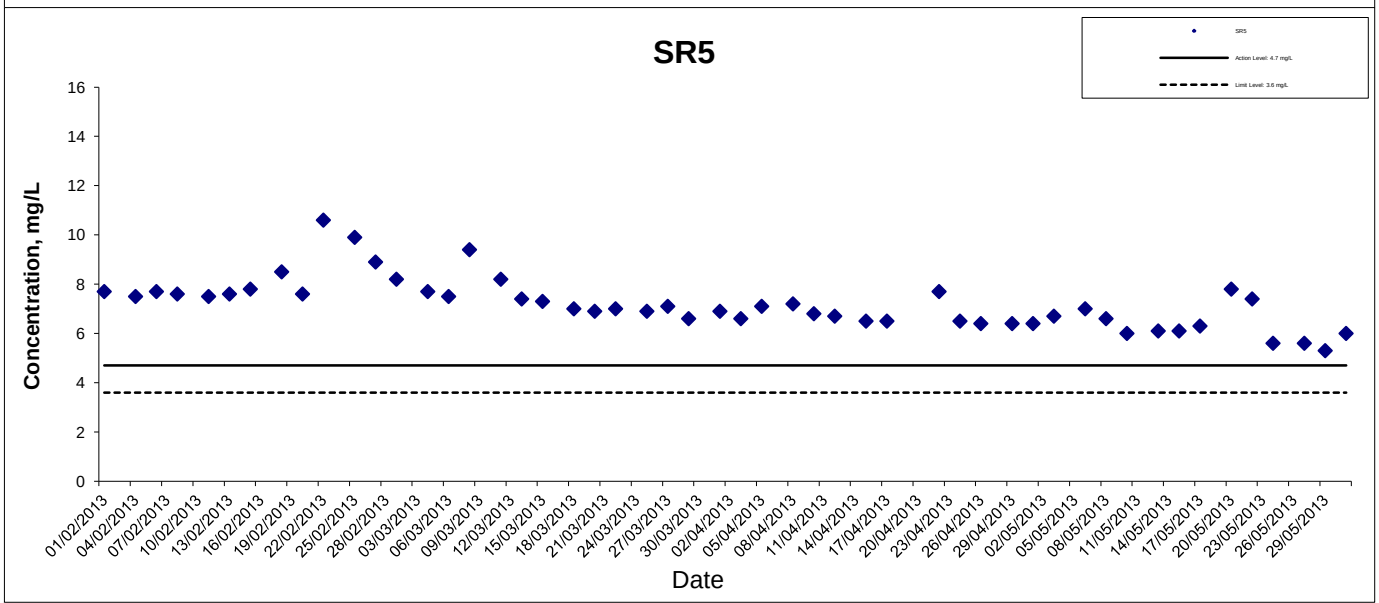


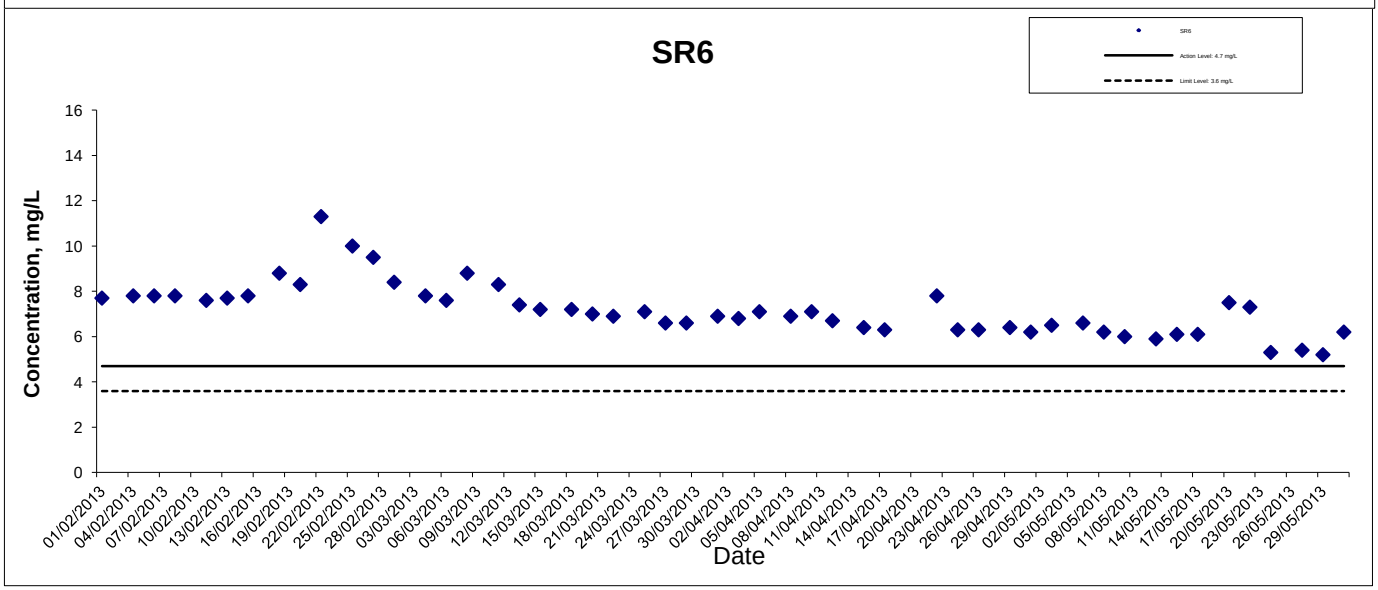


As the measured water depths were less than 3 m during all monitoring days, water samples are collected at mid-depth only .

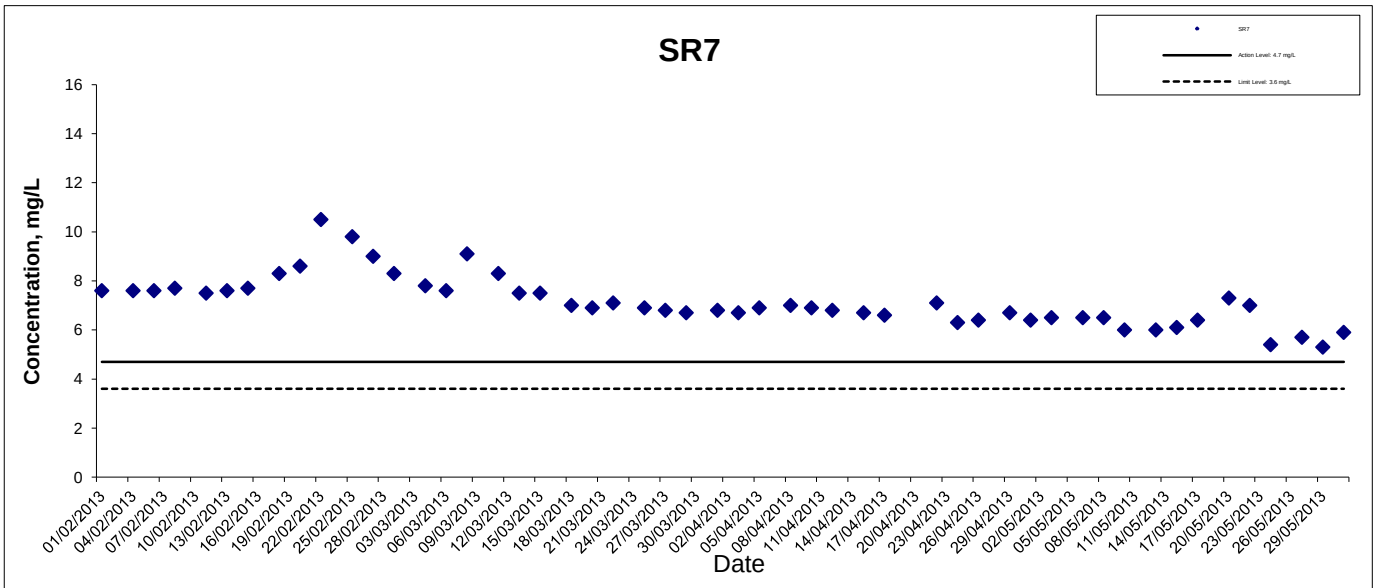
Dissolved Oxygen (Bottom) at Mid-Flood Tide

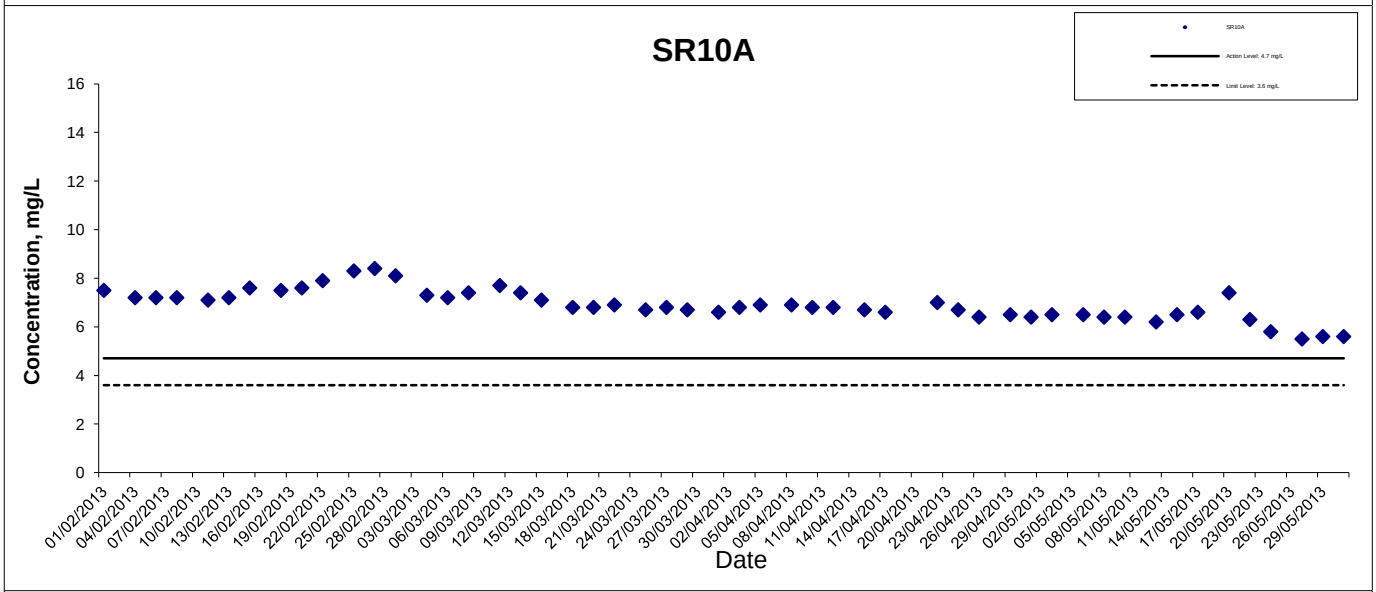


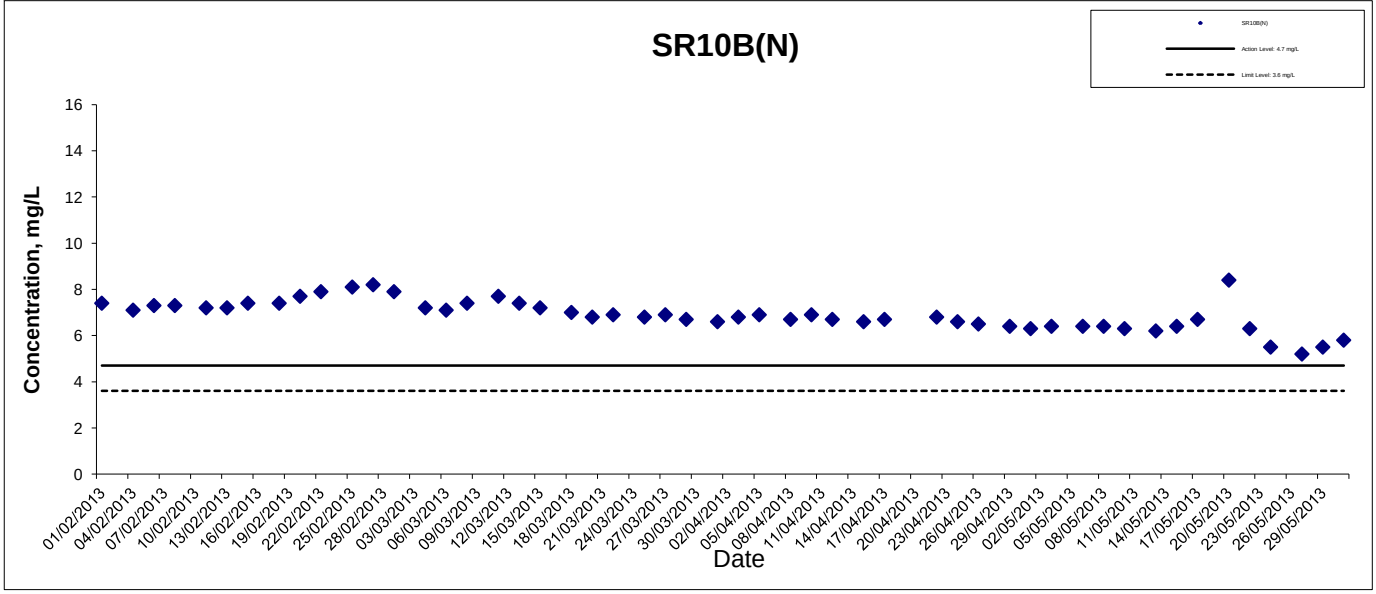




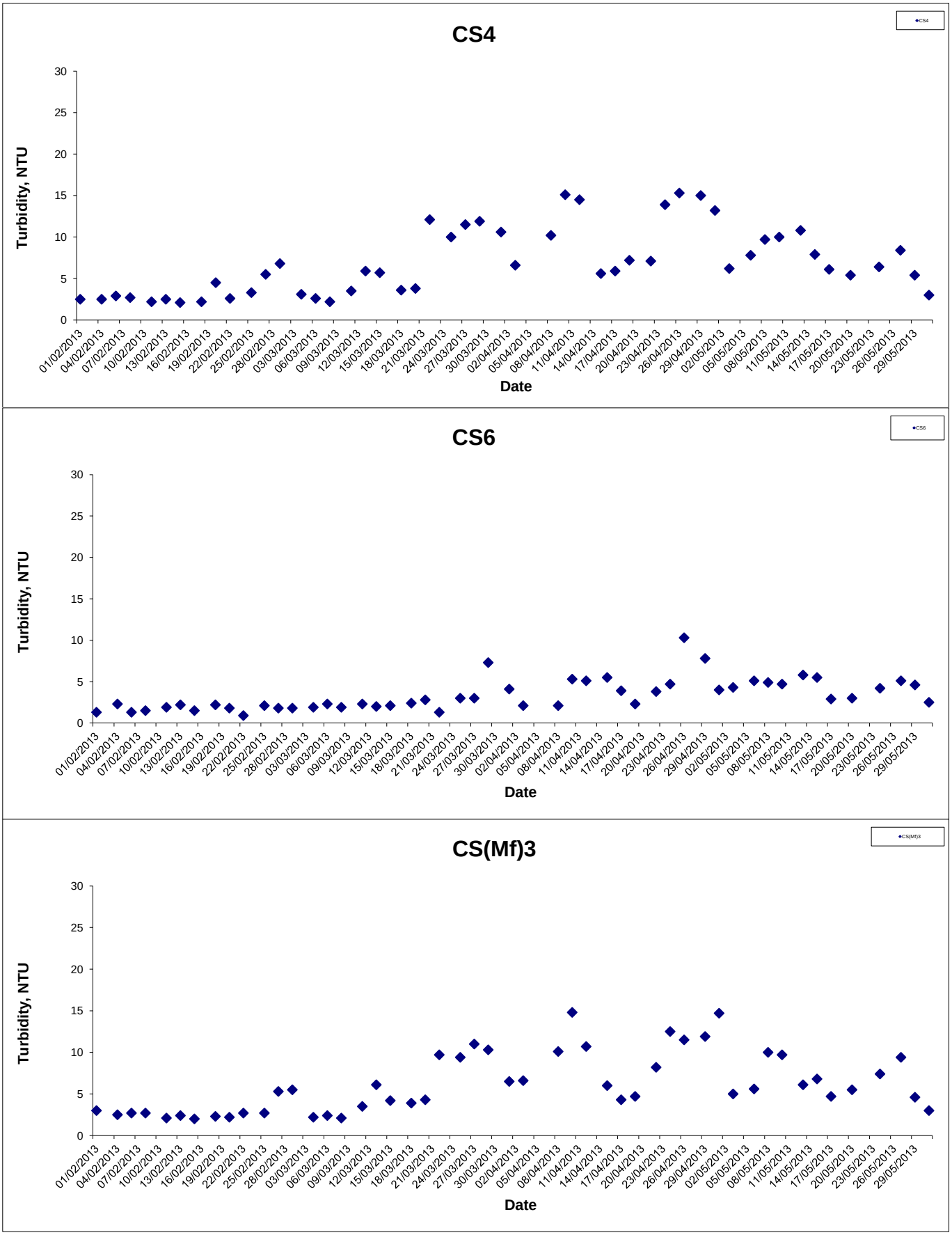
Dissolved Oxygen (Bottom) at Mid-Flood Tide



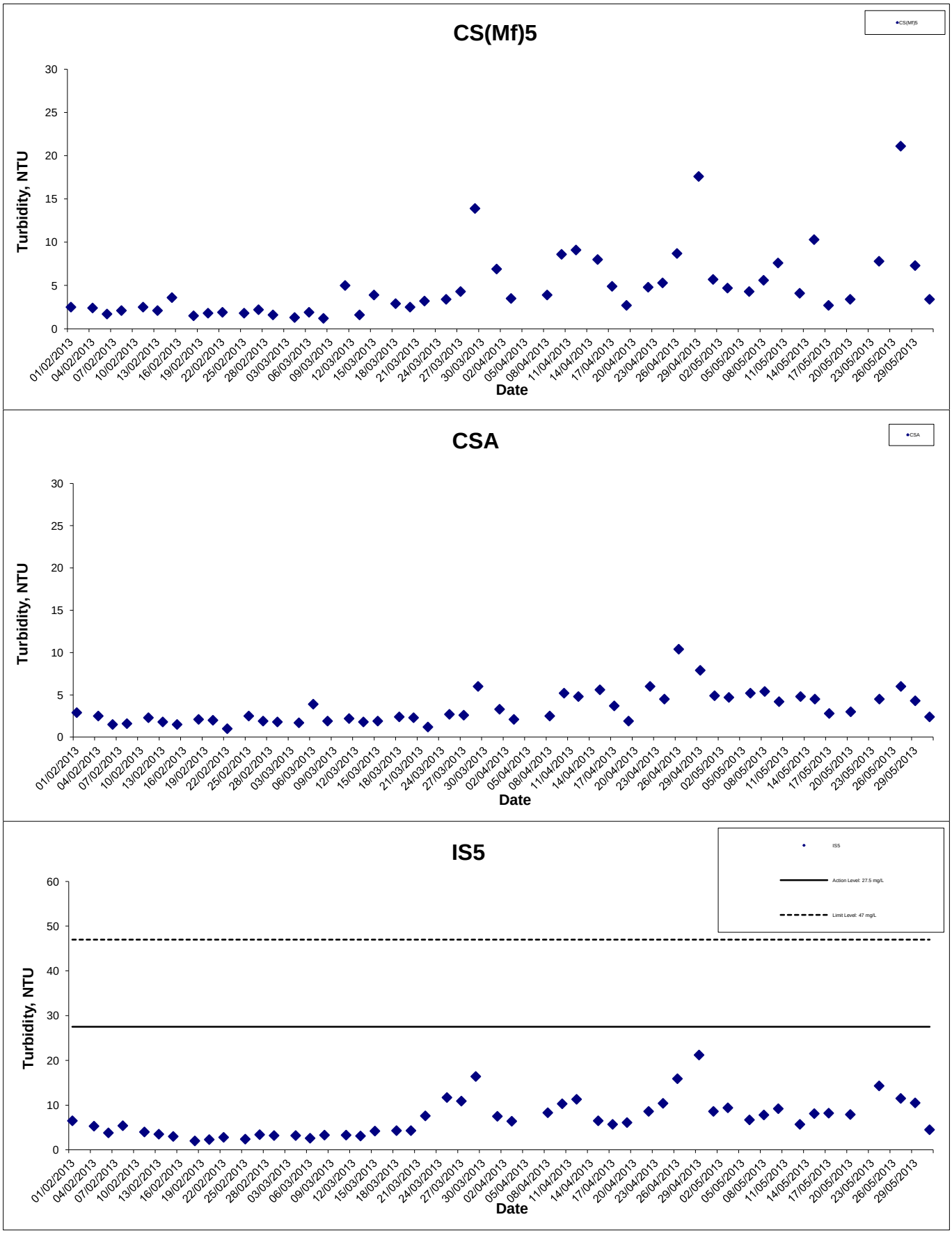




Turbidity at Mid-Ebb Tide



Turbidity at Mid-Ebb Tide



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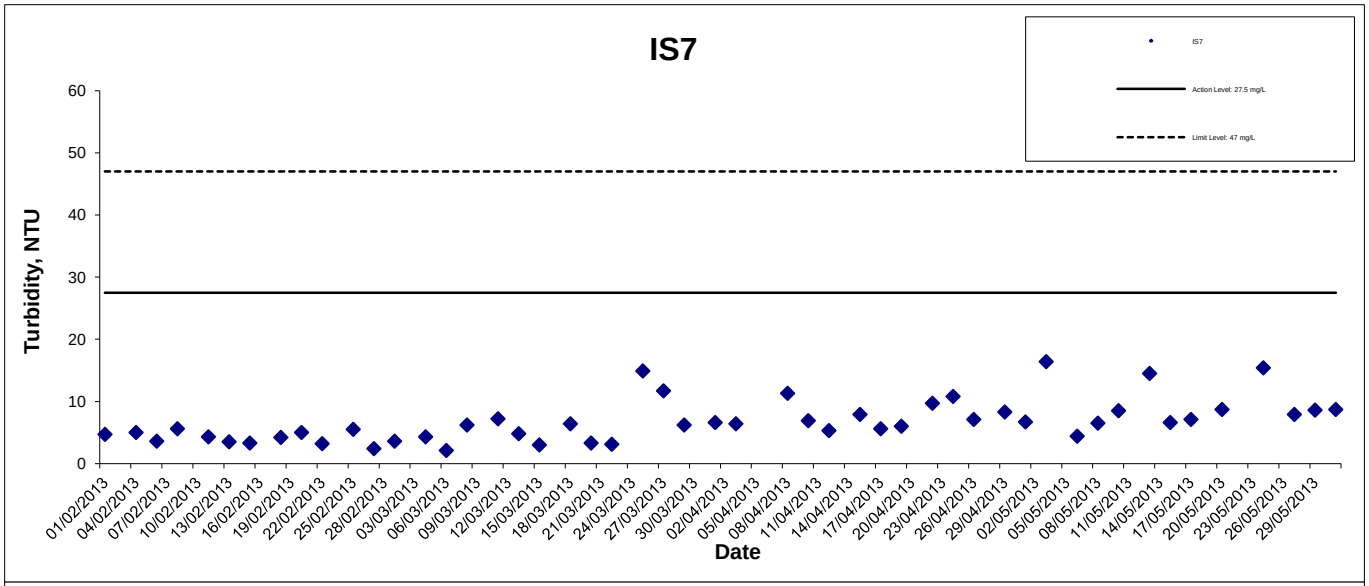
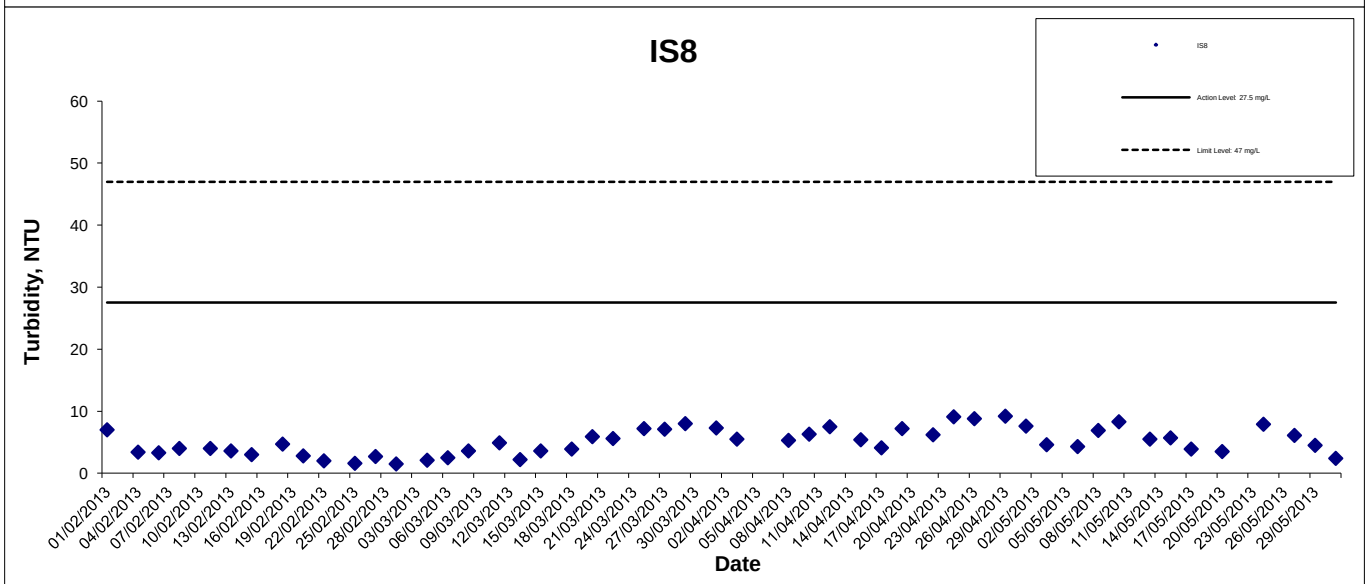
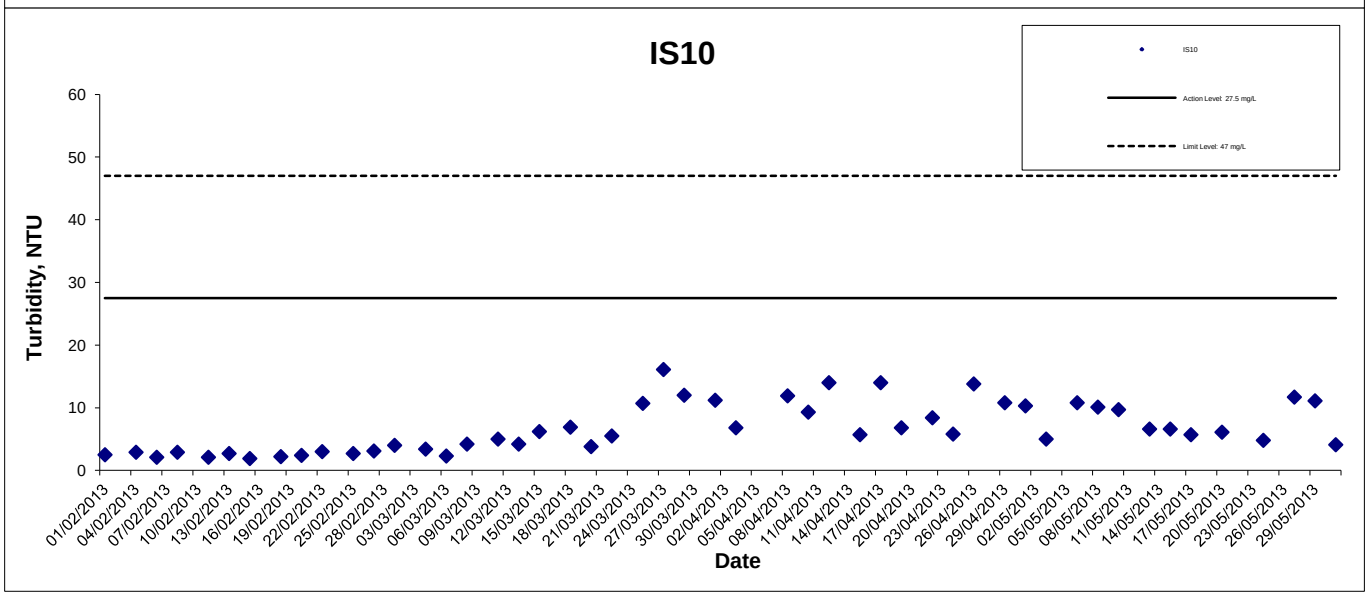
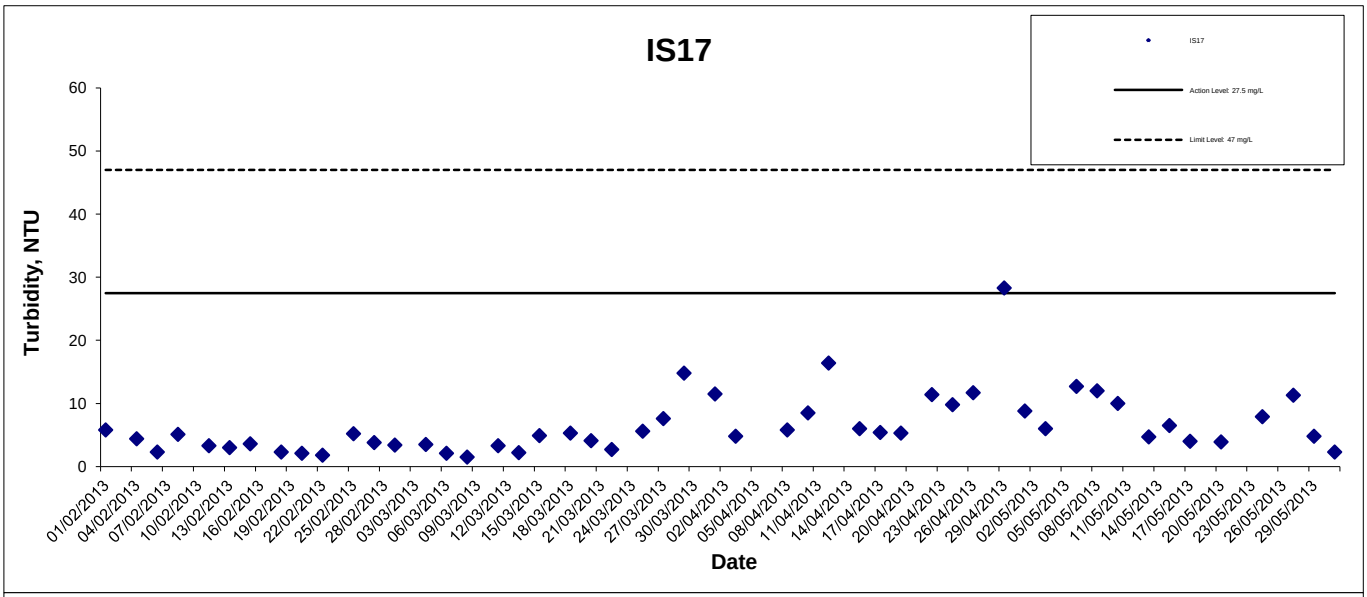
Turbidity at Mid-Ebb Tide

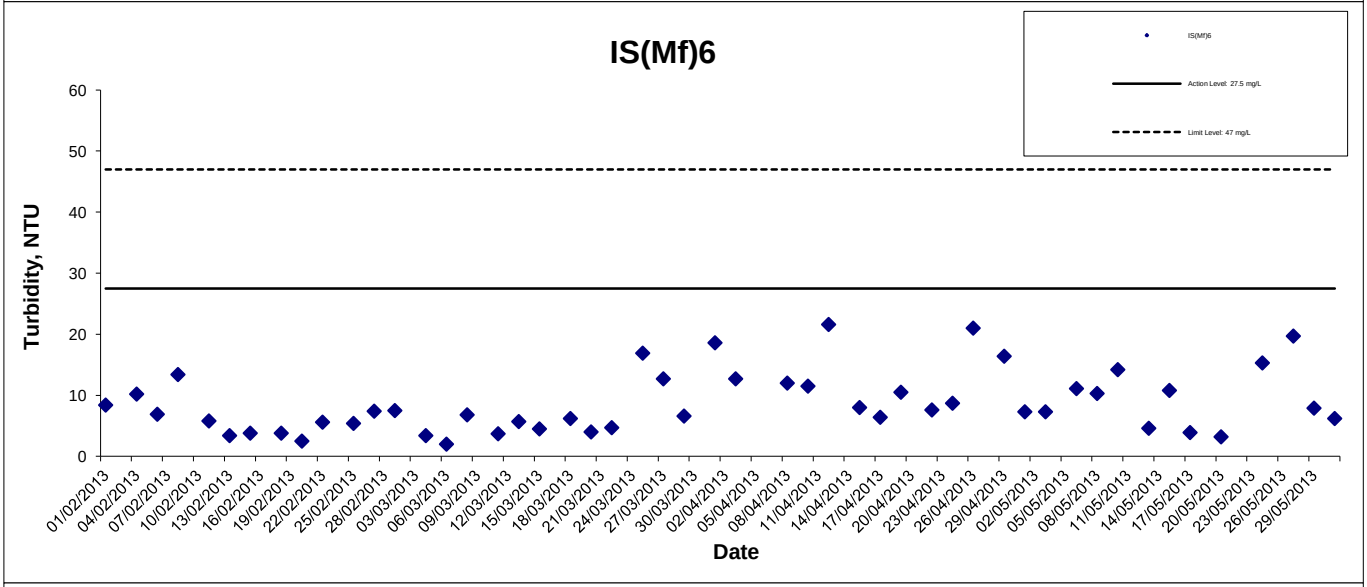


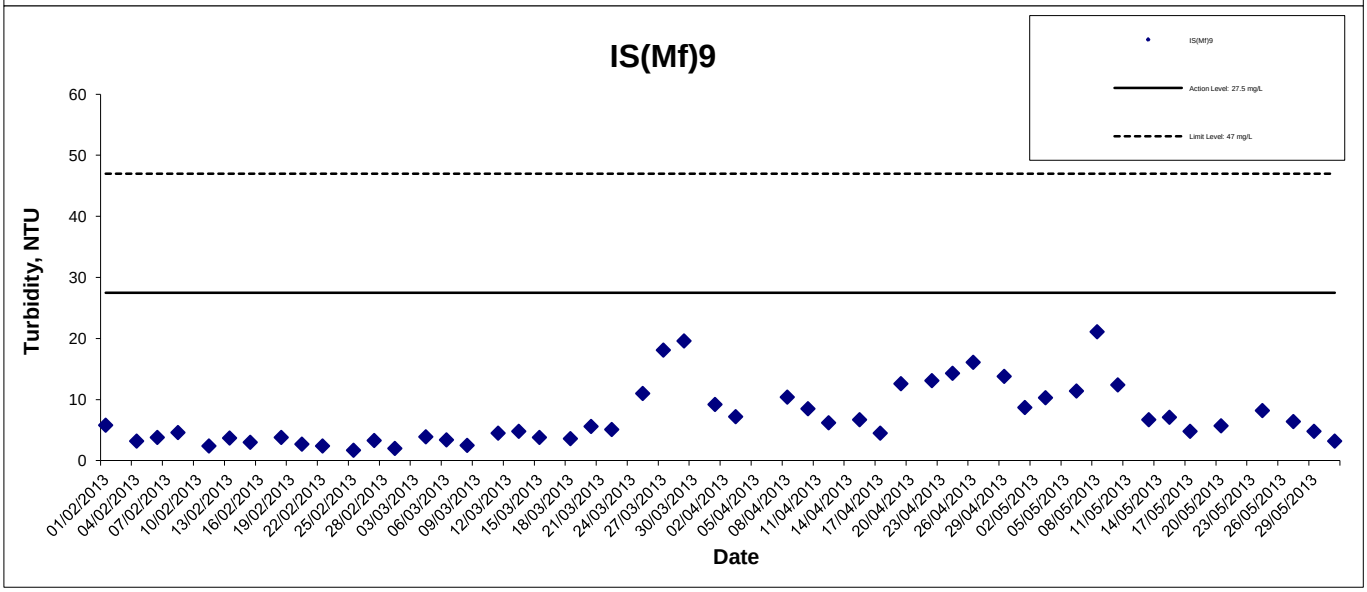




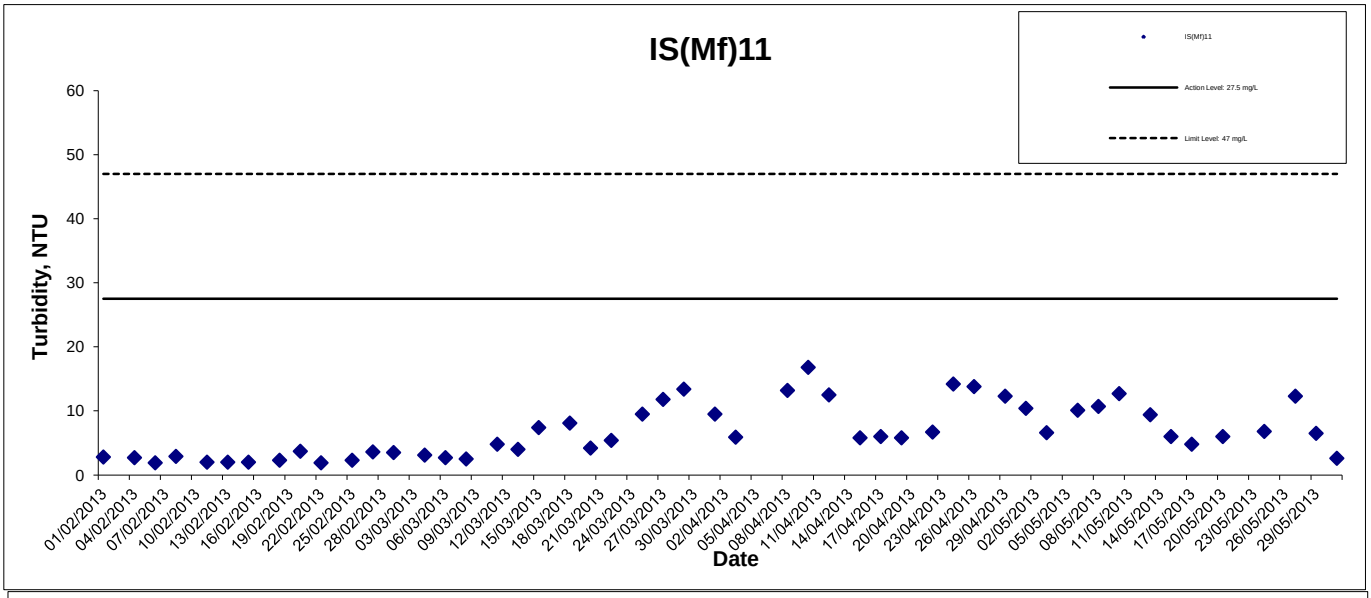
Turbidity at Mid-Ebb Tide

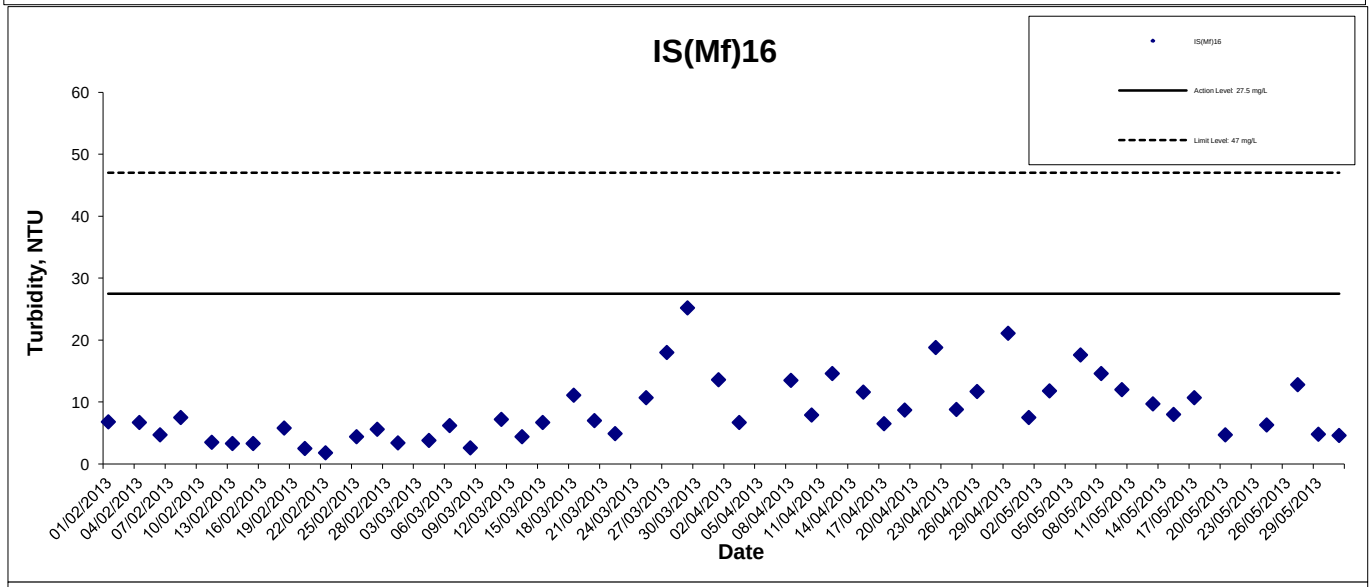


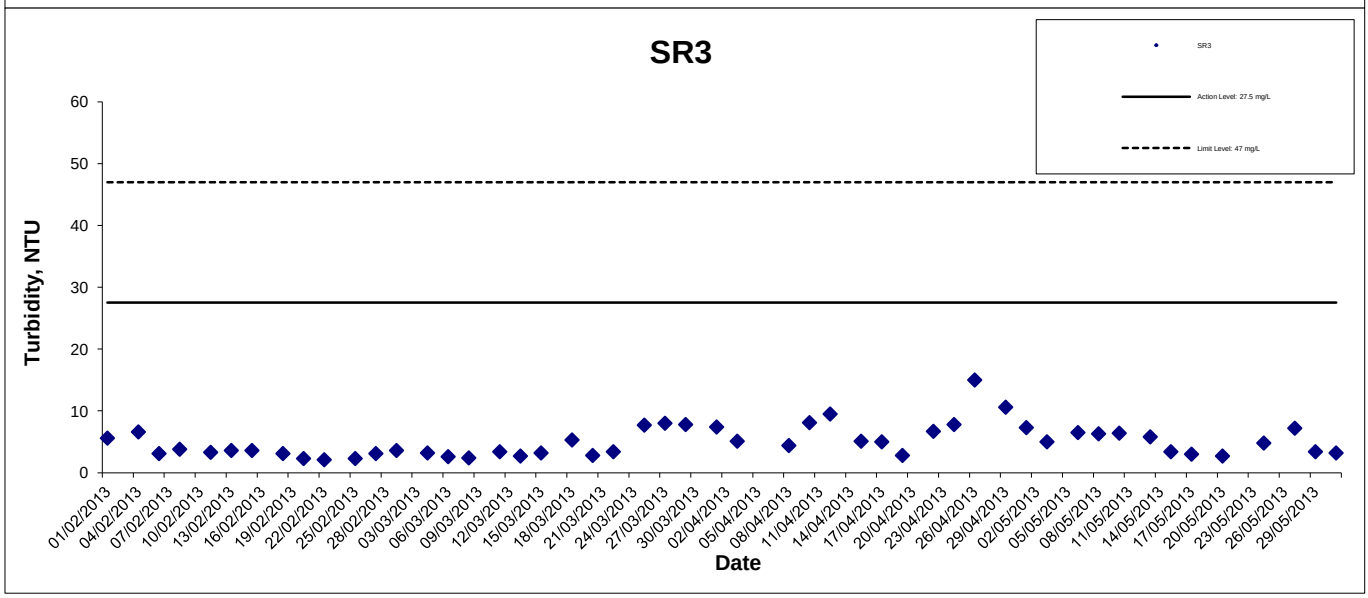




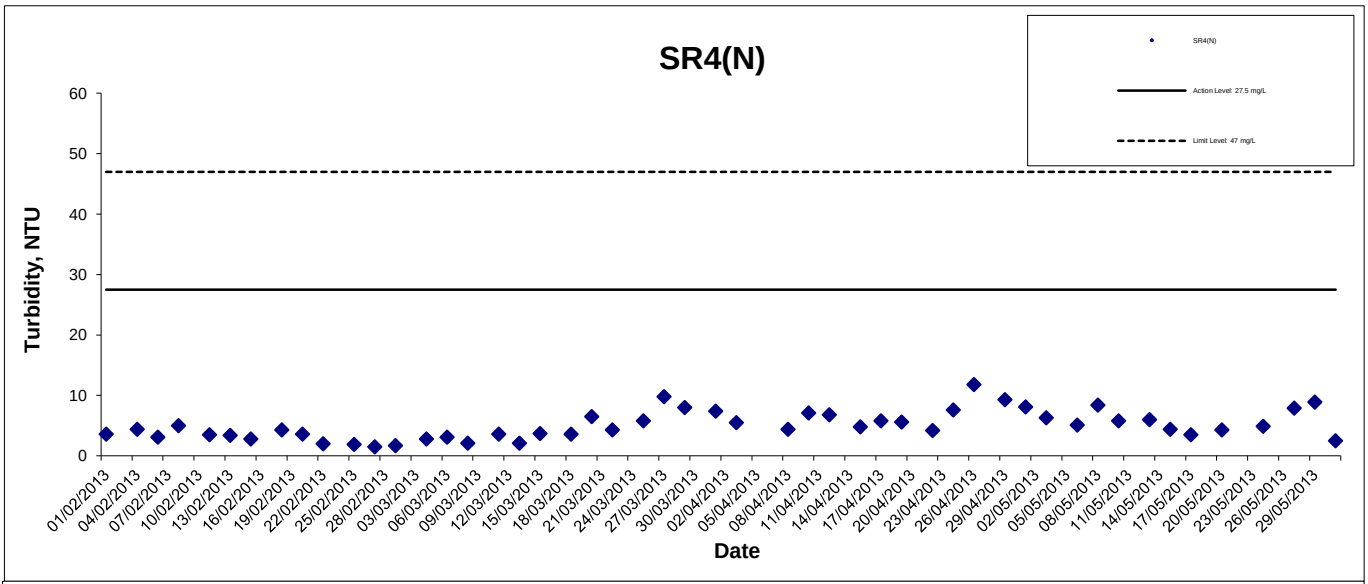
Turbidity at Mid-Ebb Tide

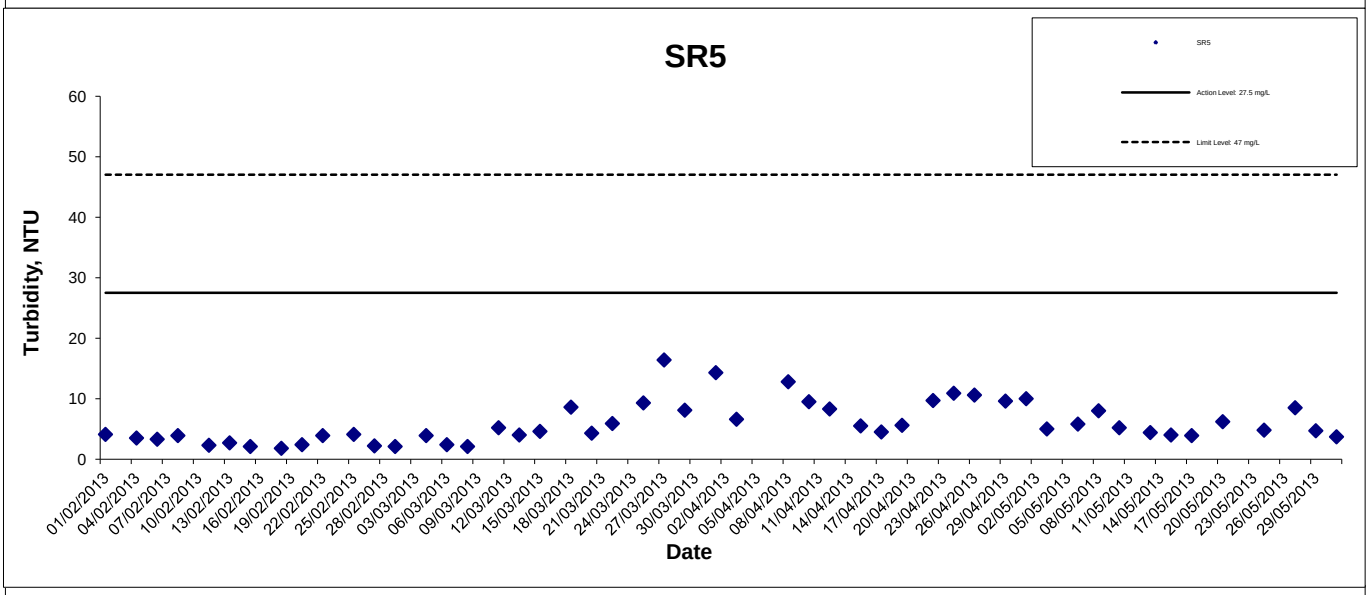


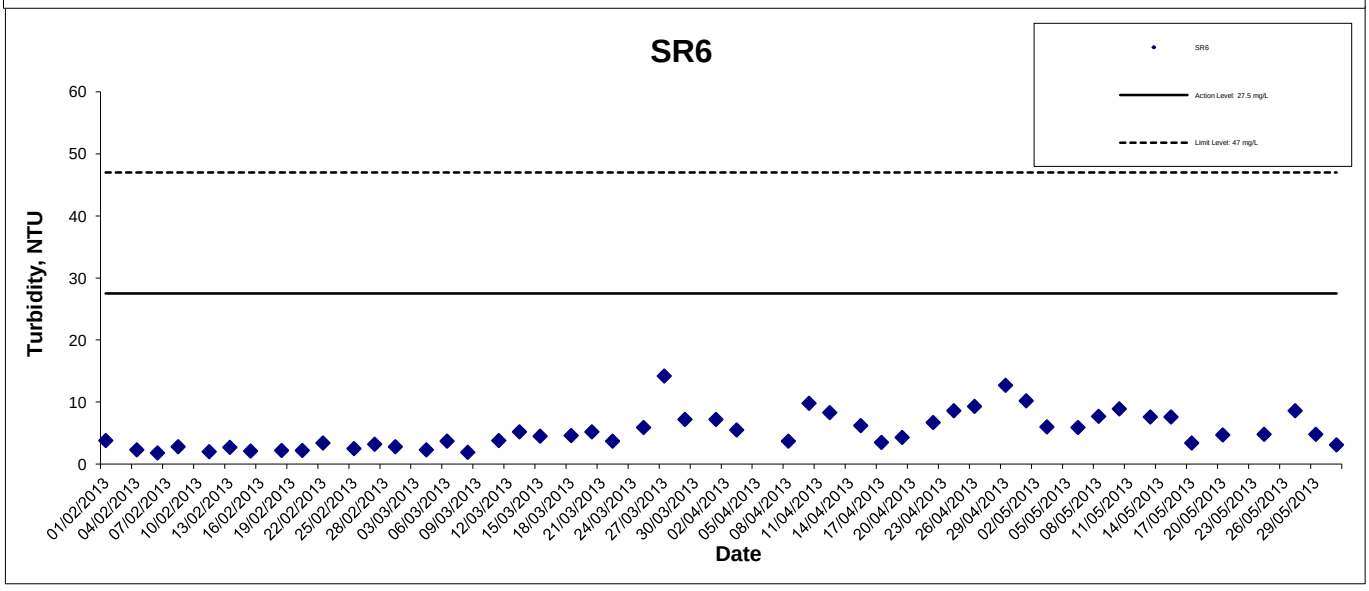




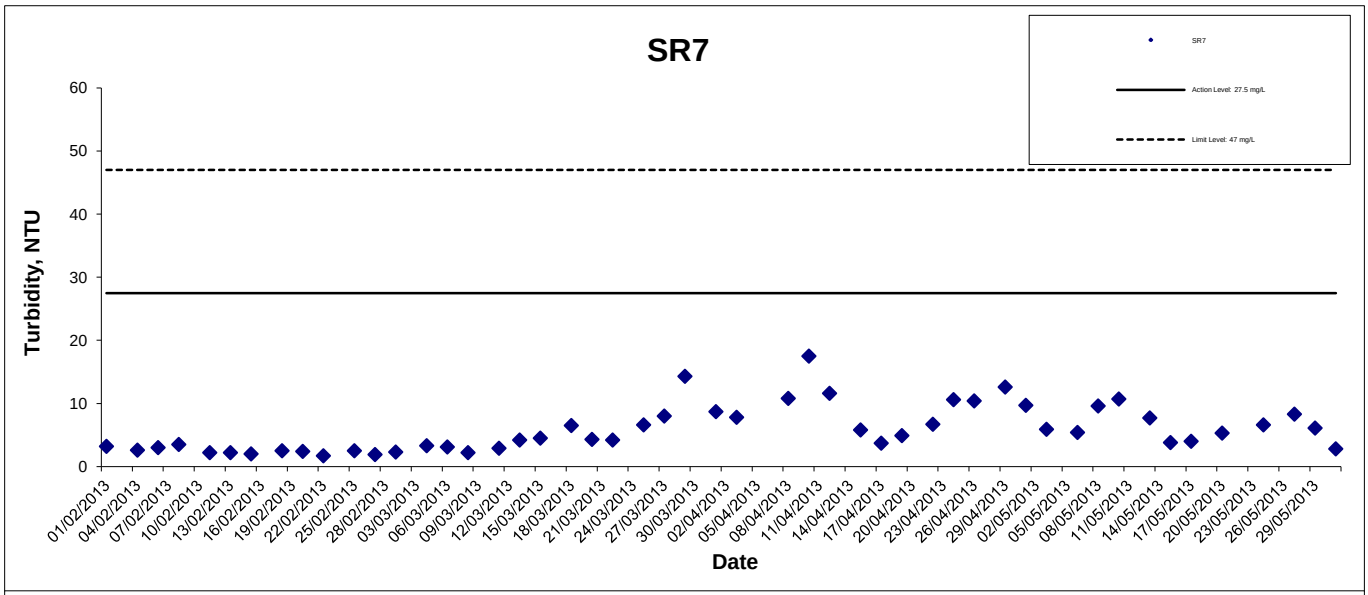
Turbidity at Mid-Ebb Tide

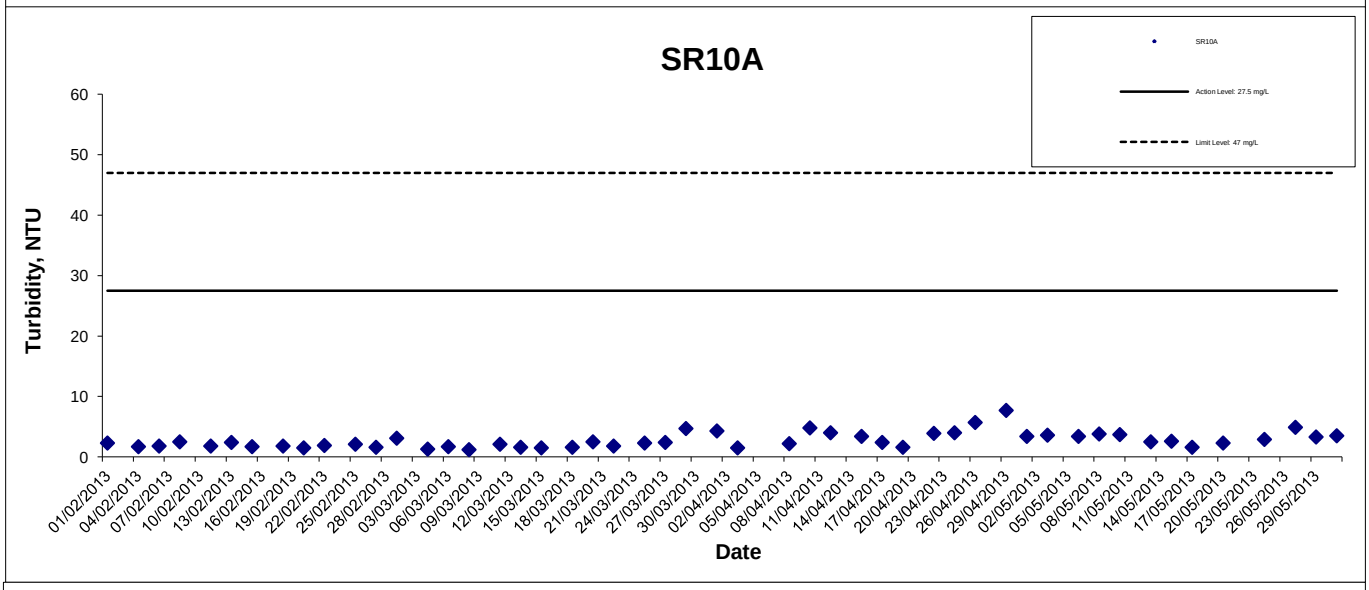


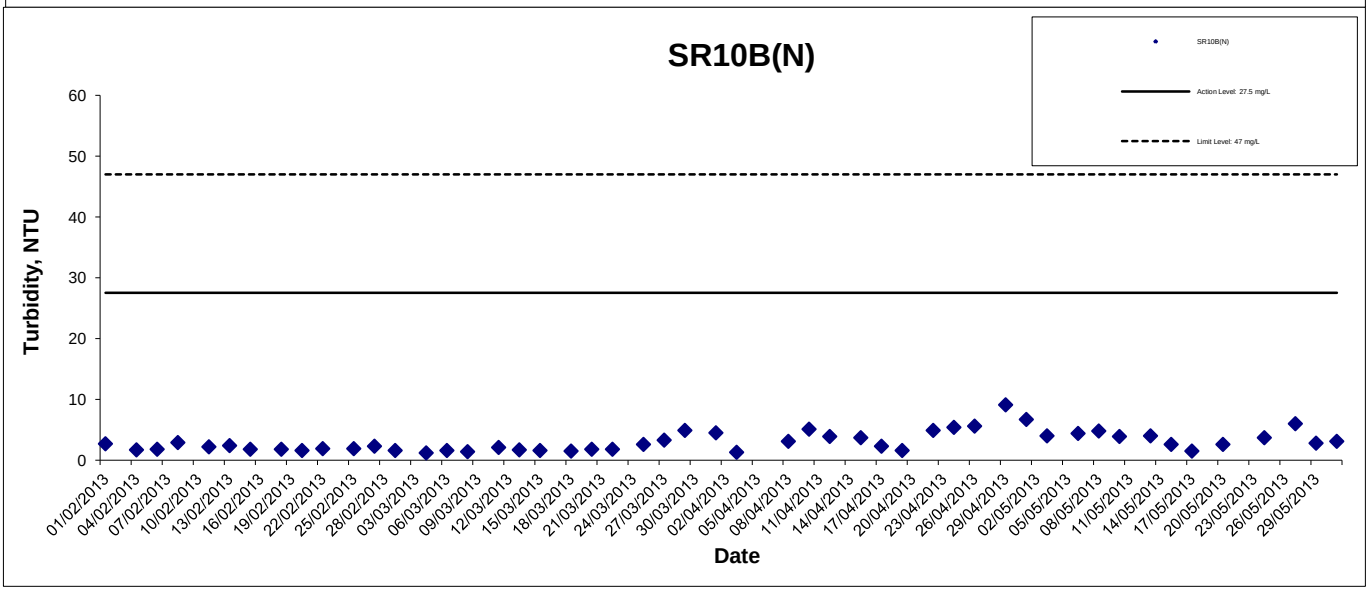




Turbidity at Mid-Ebb Tide







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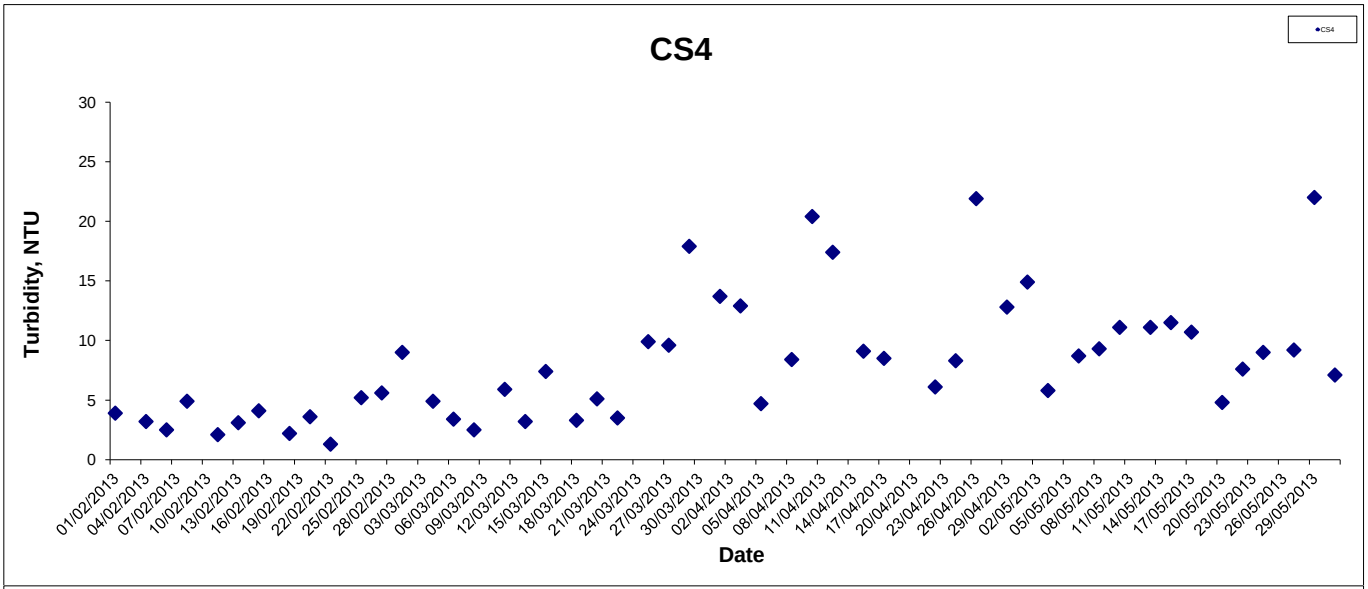
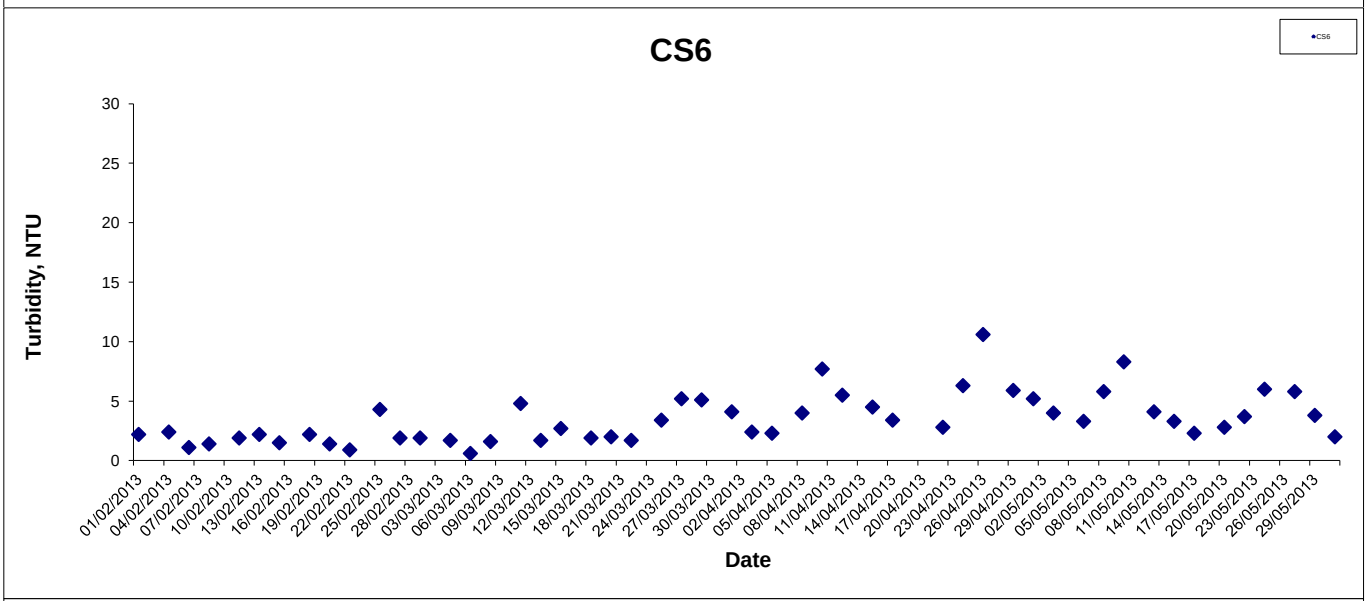
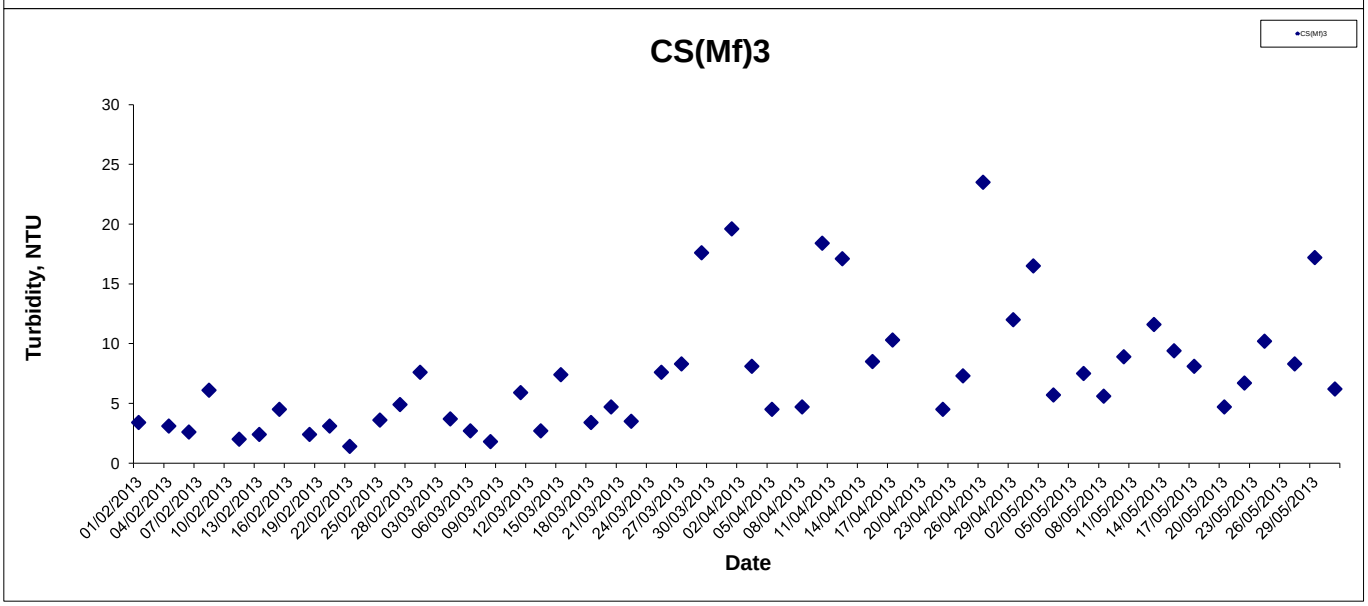
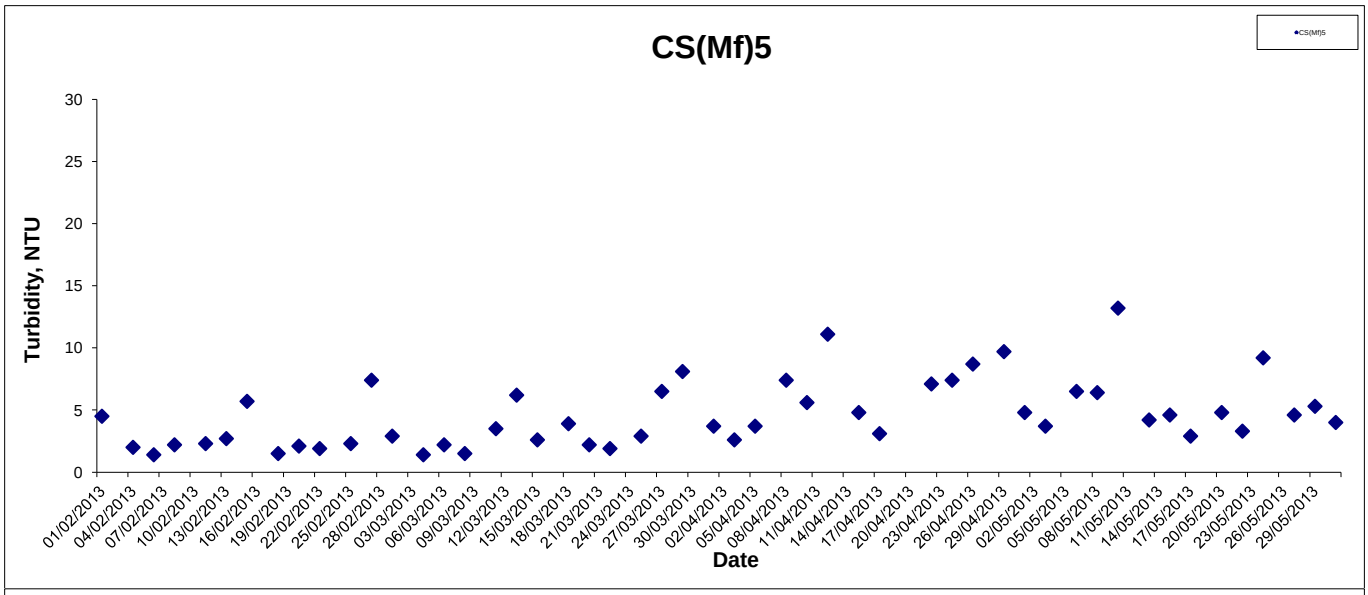
Turbidity at Mid-Flood Tide

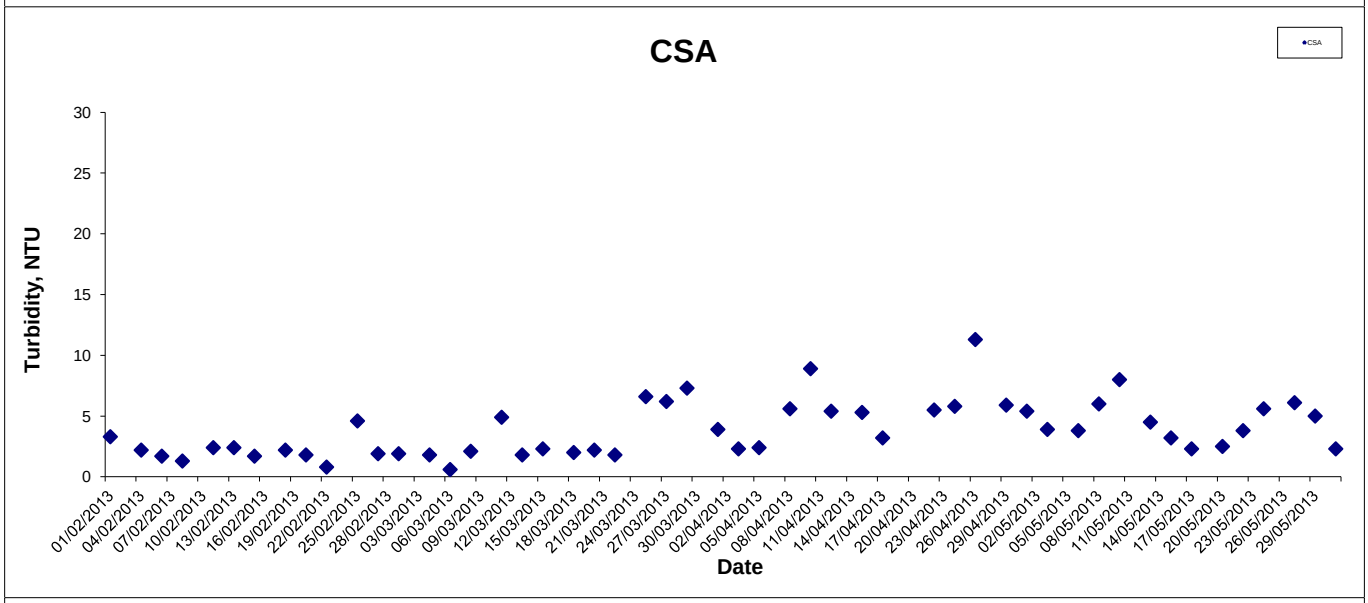


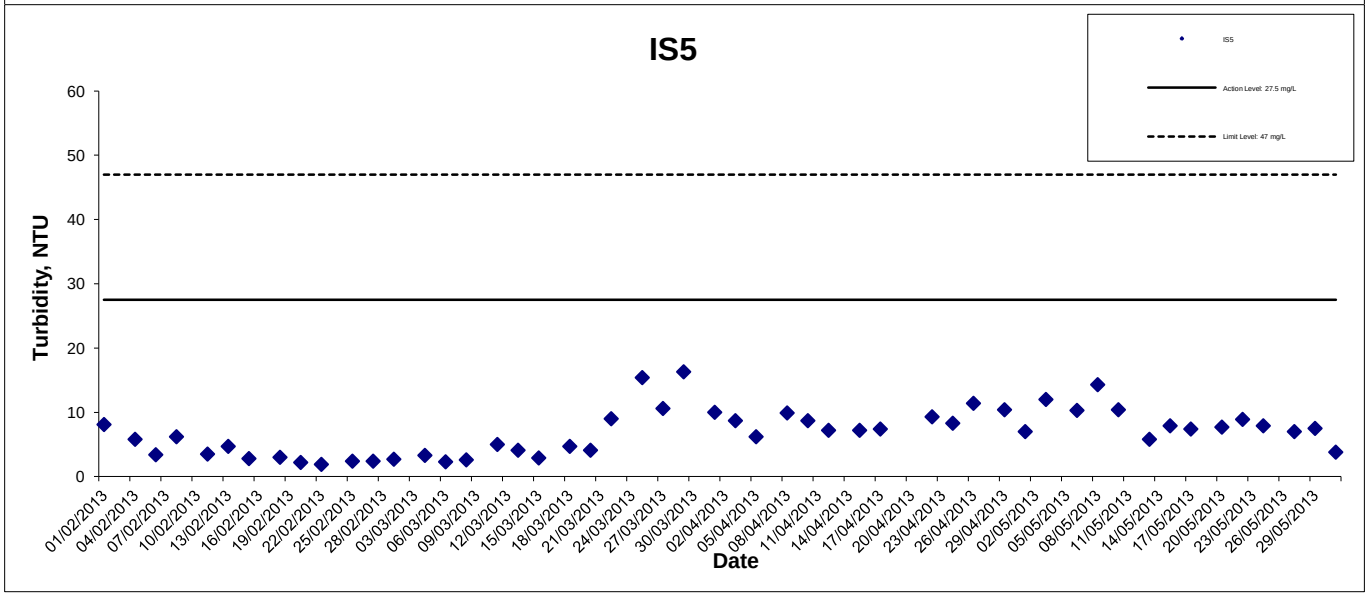




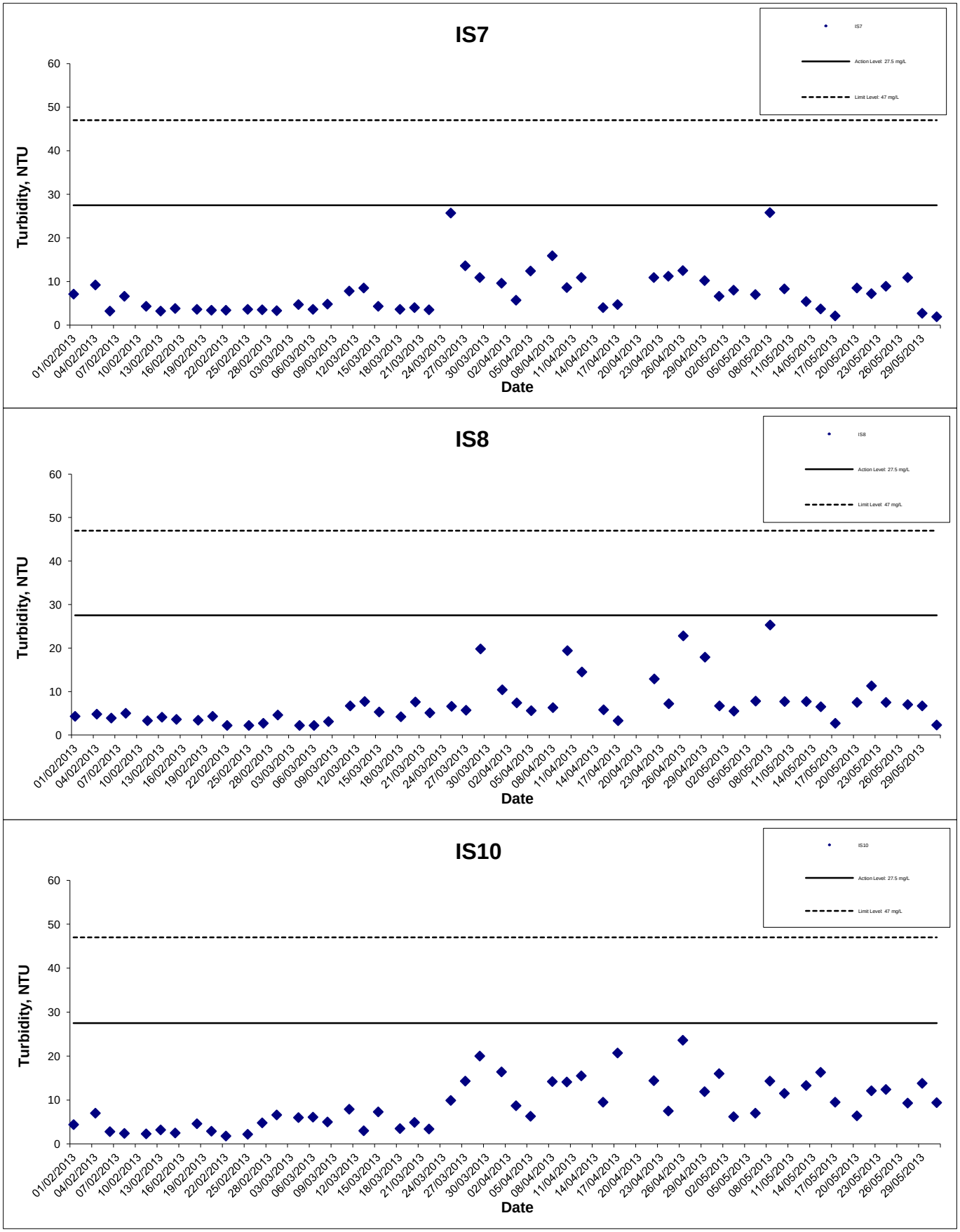
Turbidity at Mid-Flood Tide



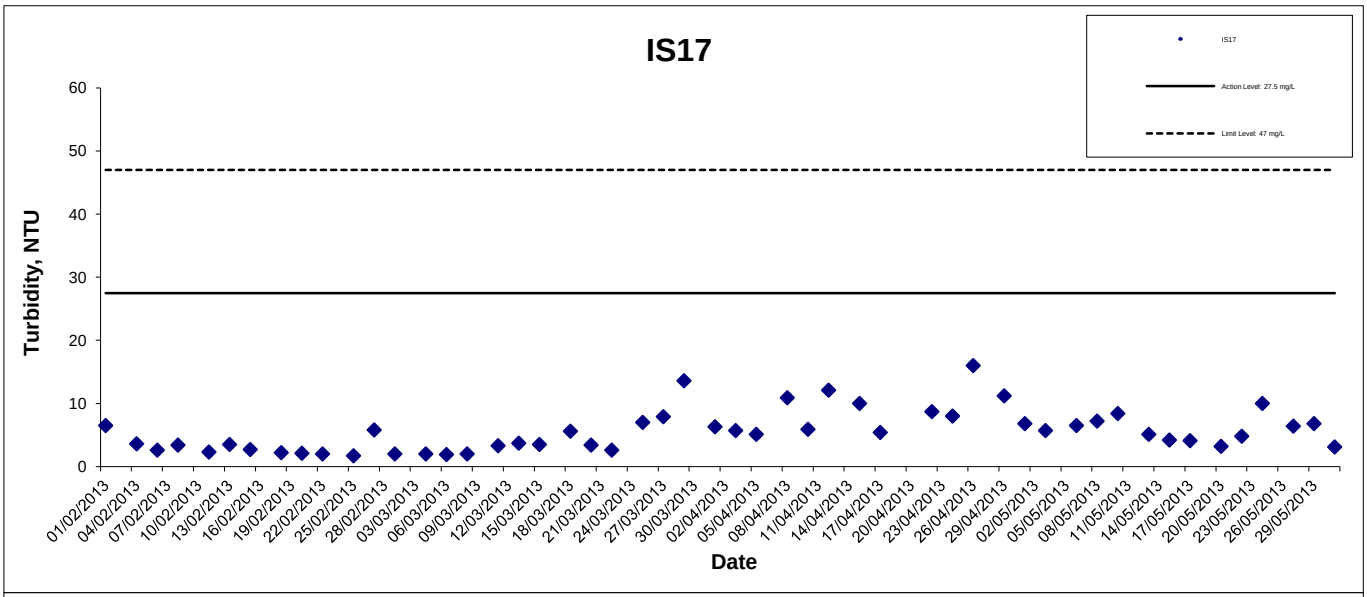


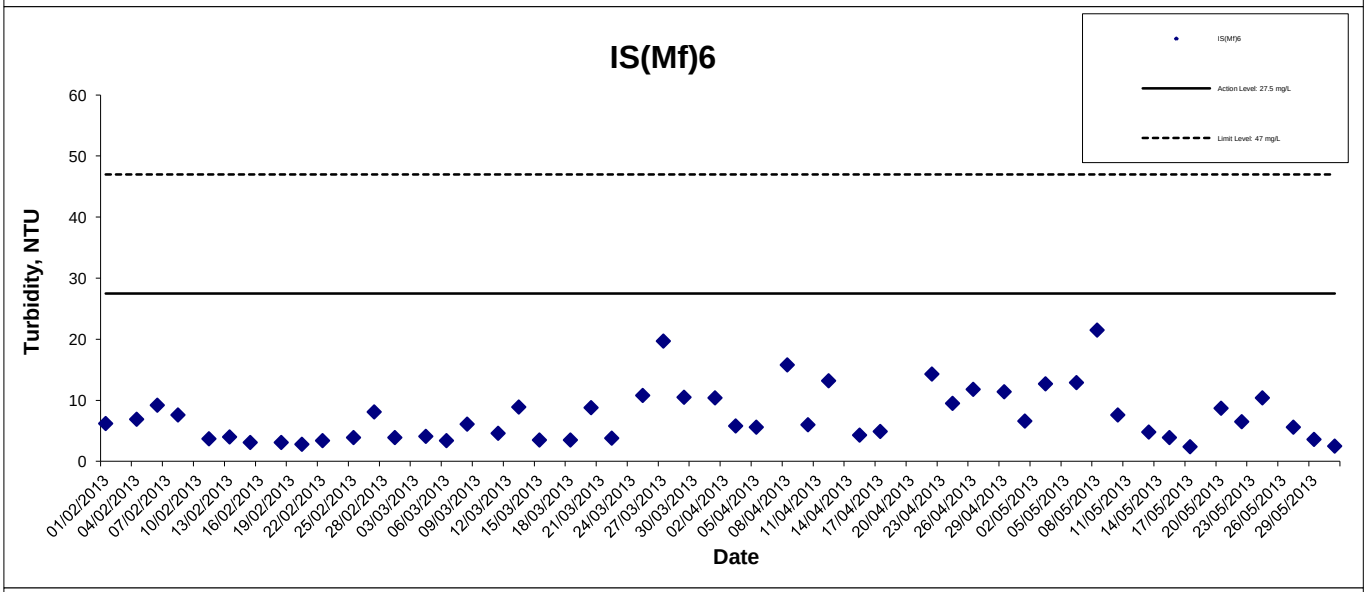


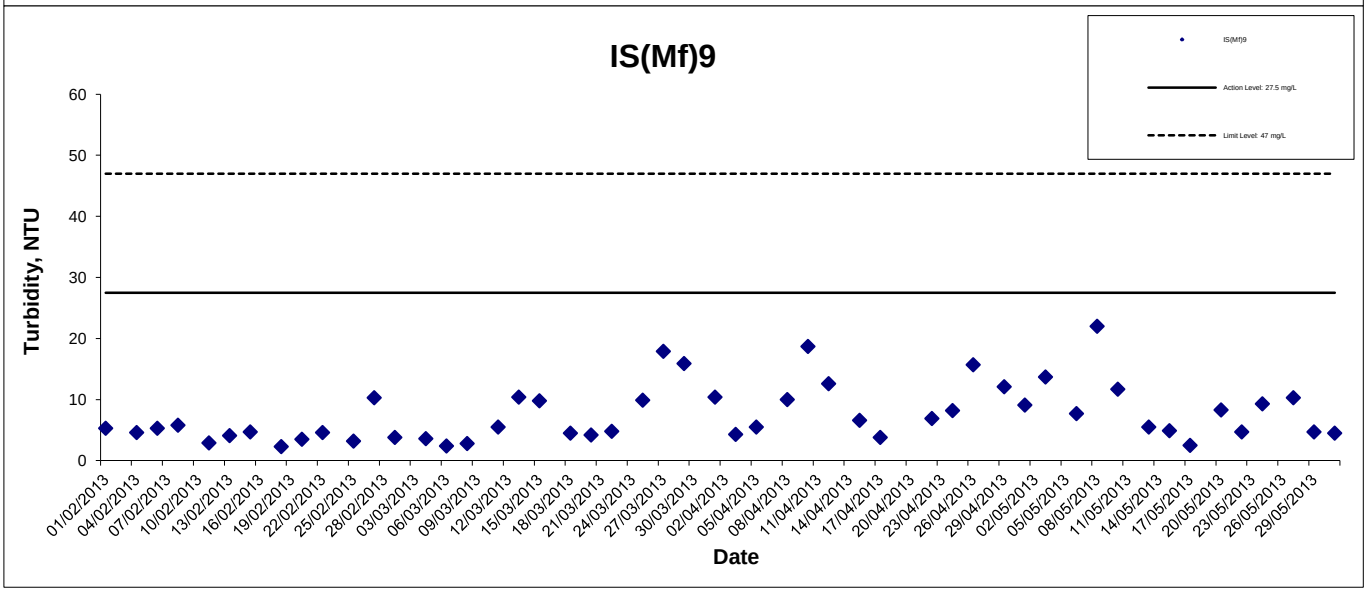
Turbidity at Mid-Flood Tide



Turbidity at Mid-Flood Tide







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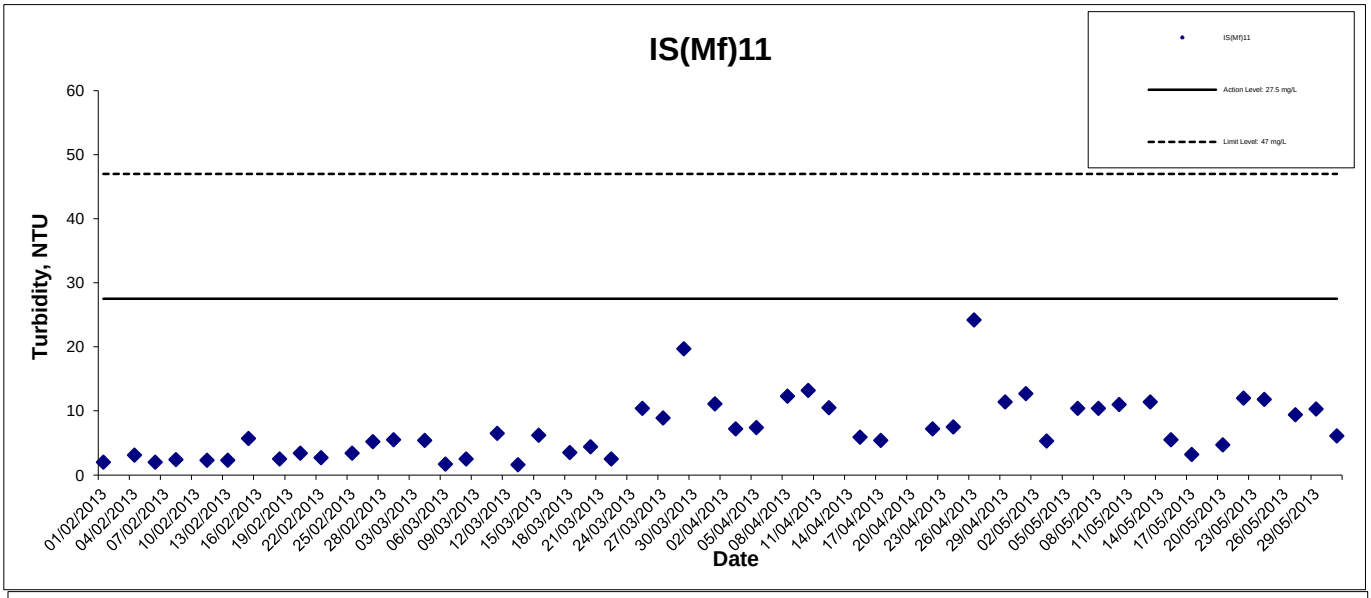
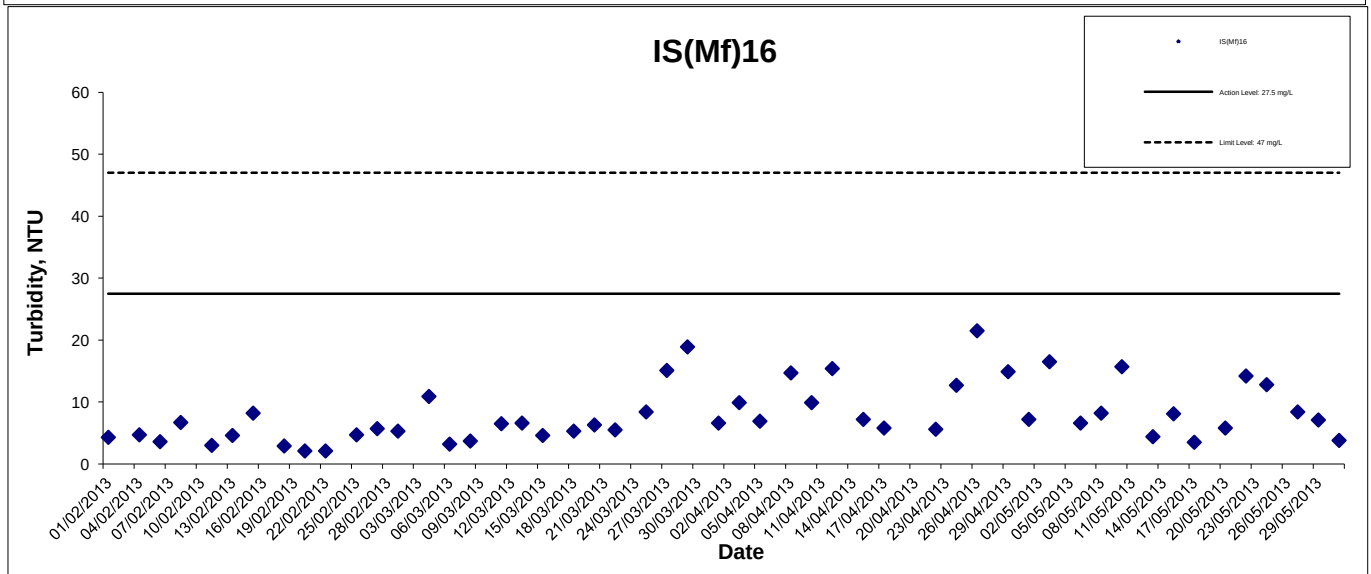
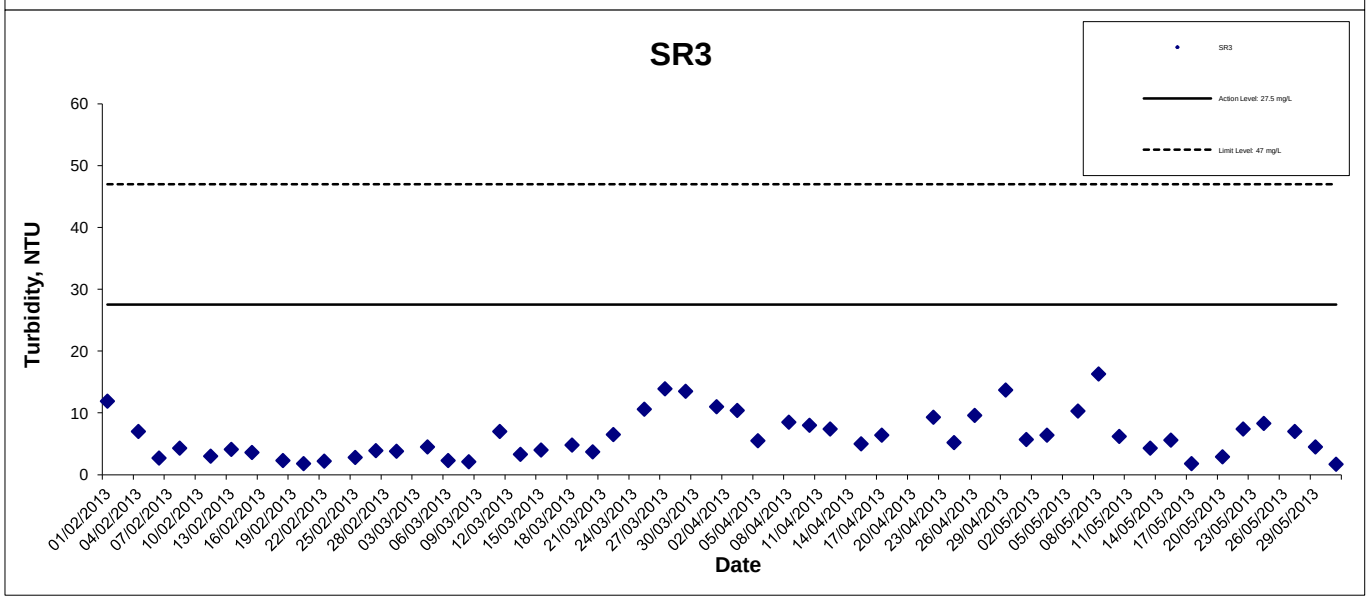
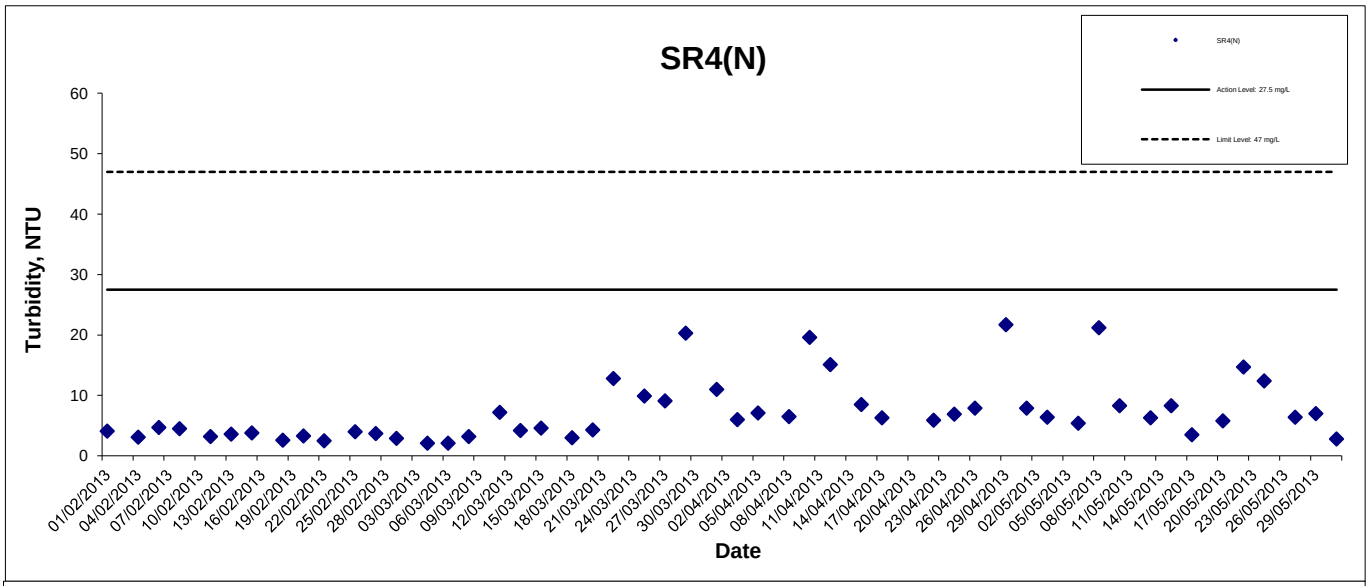
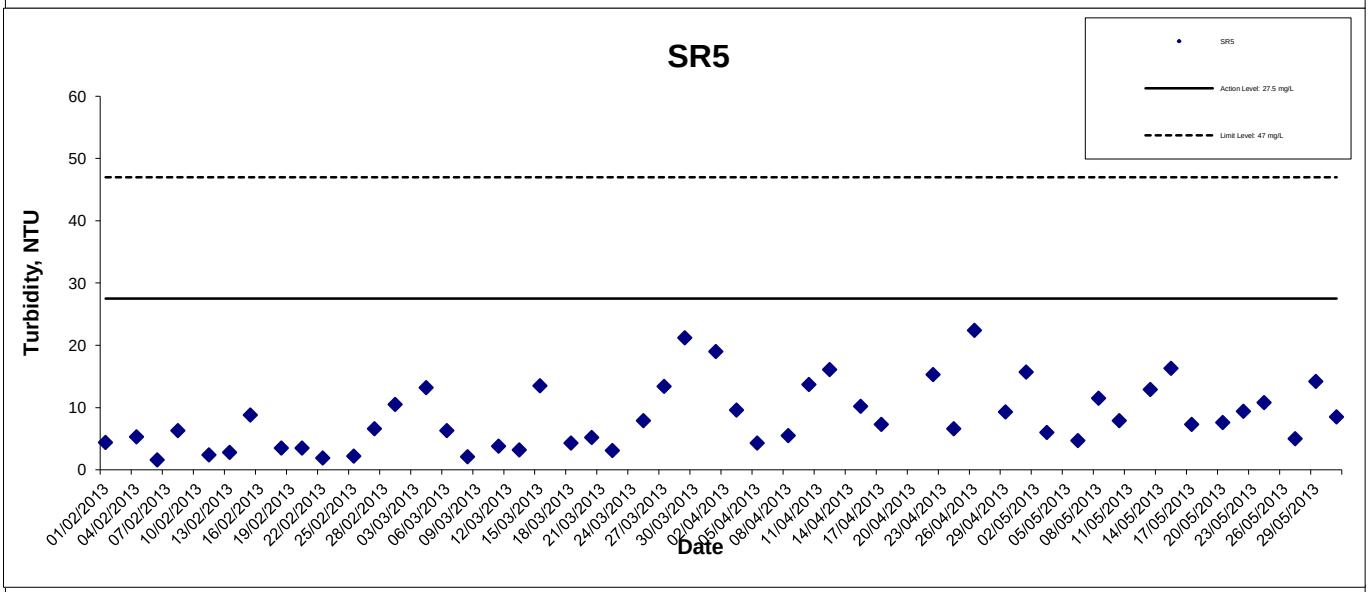


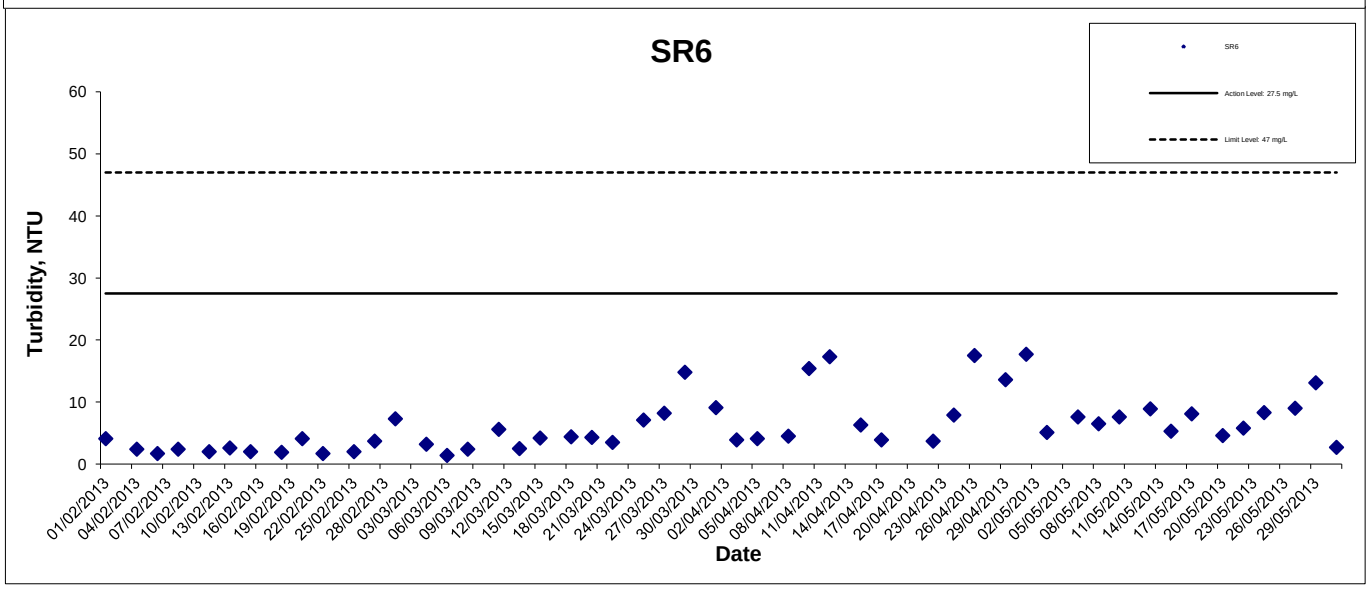




Turbidity at Mid-Flood Tide







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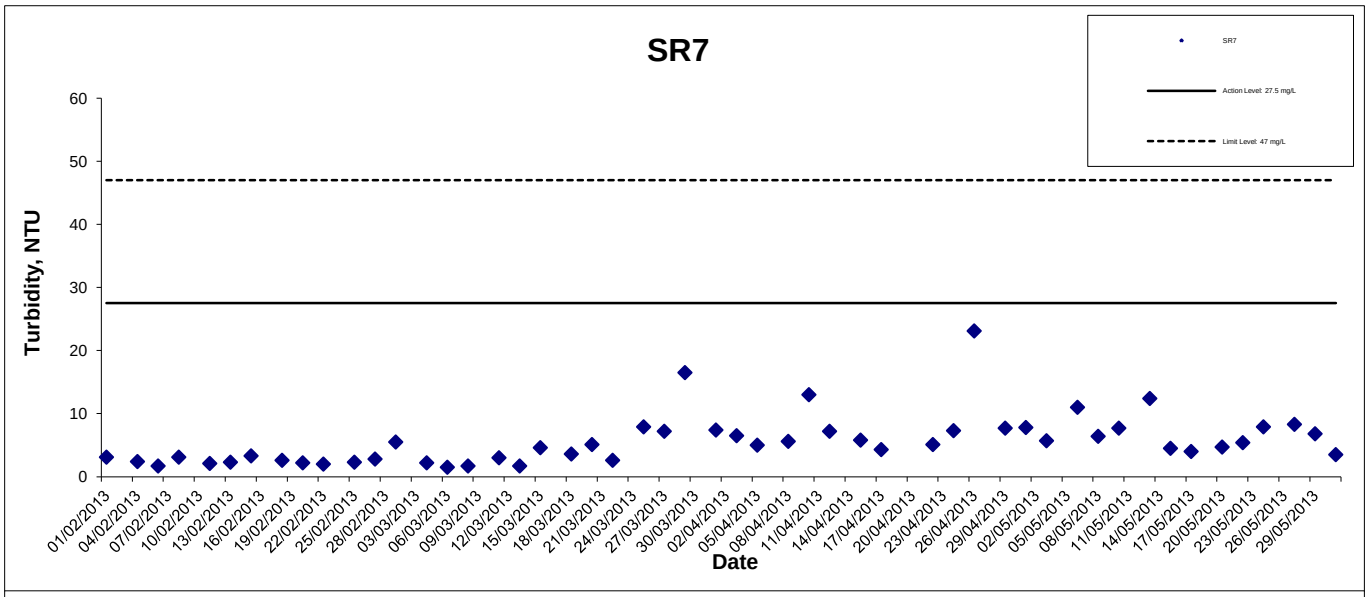
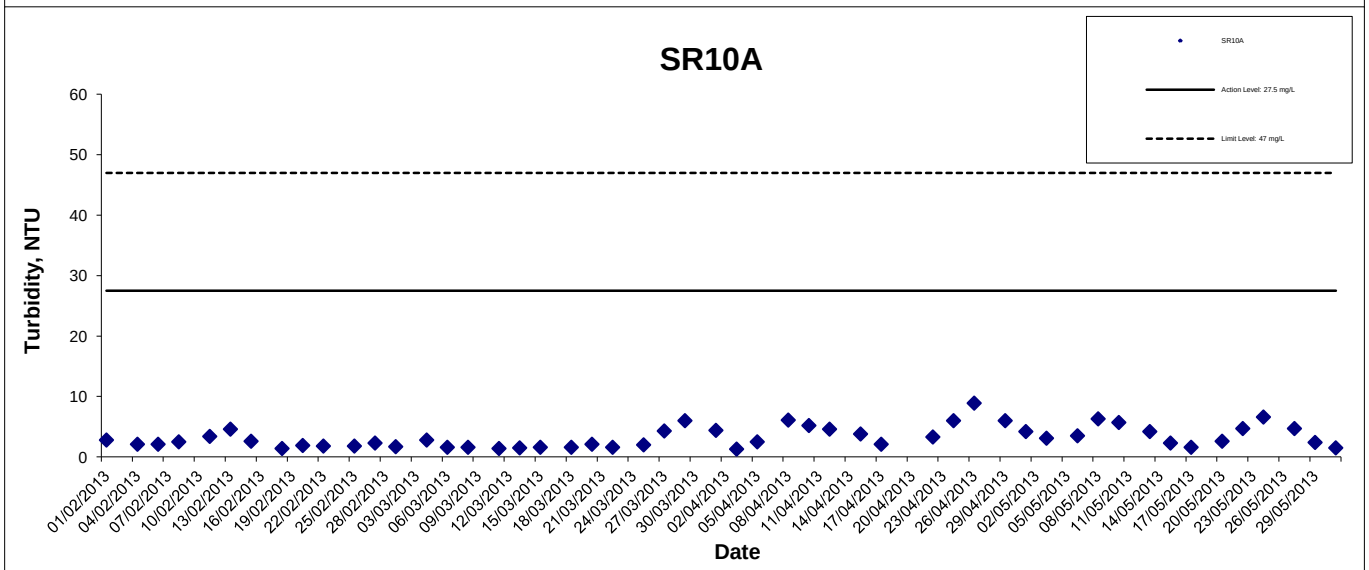
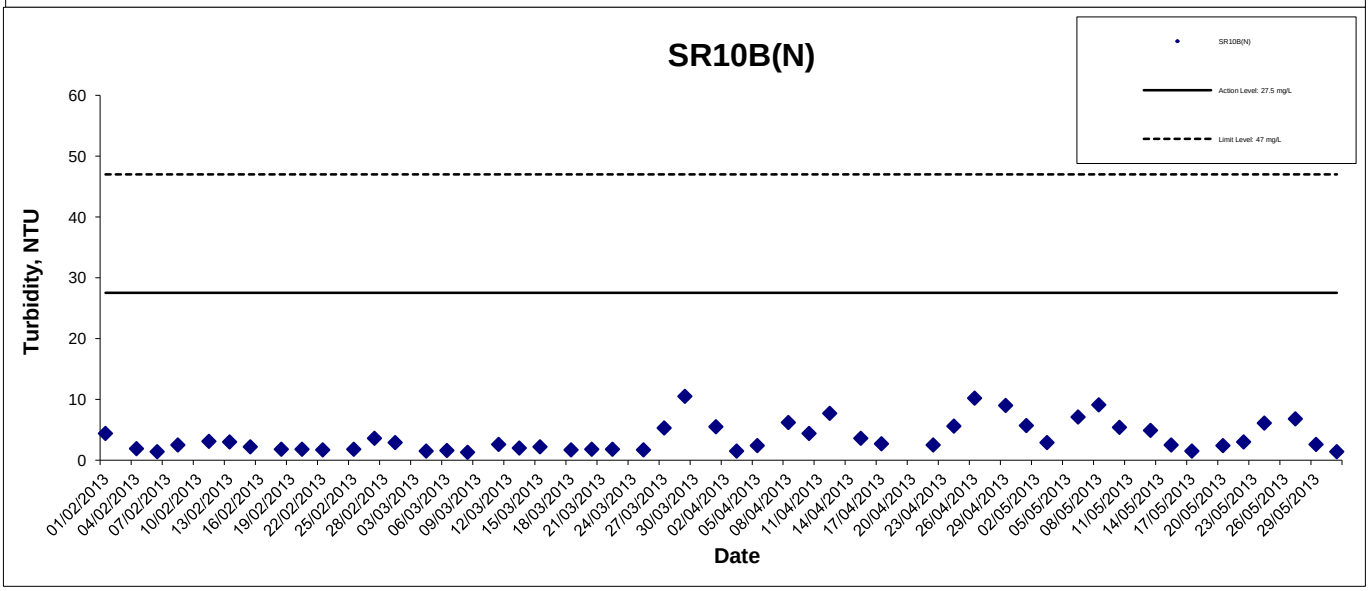
Turbidity at Mid-Flood Tide







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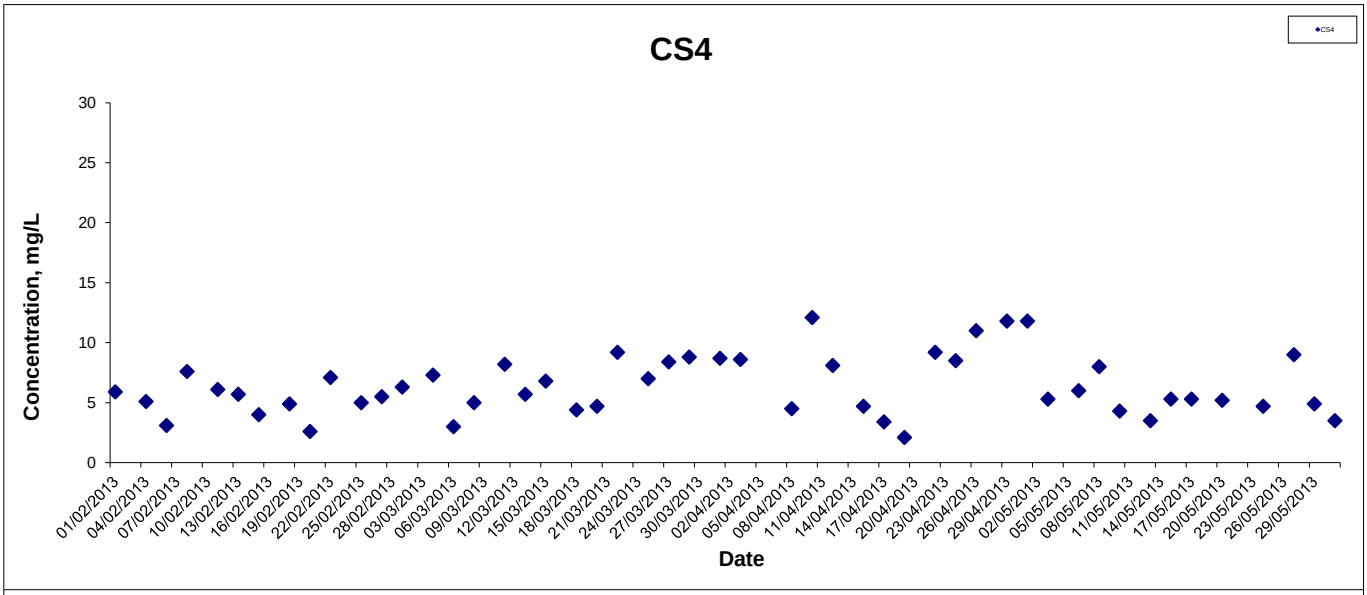

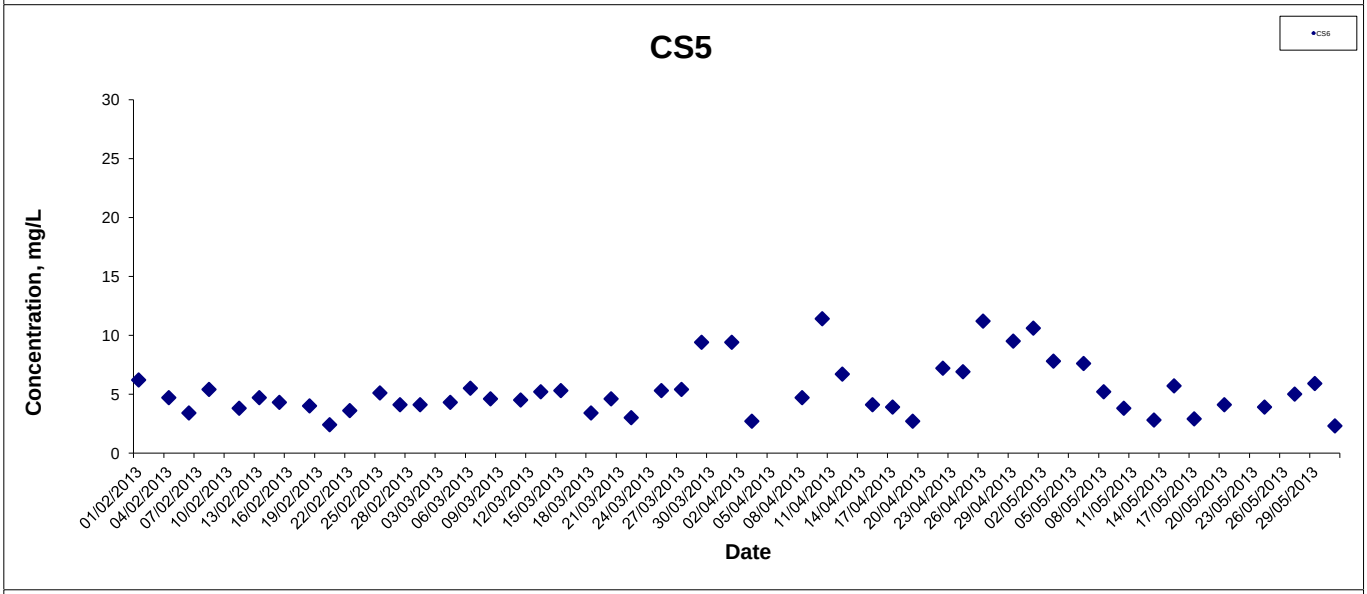

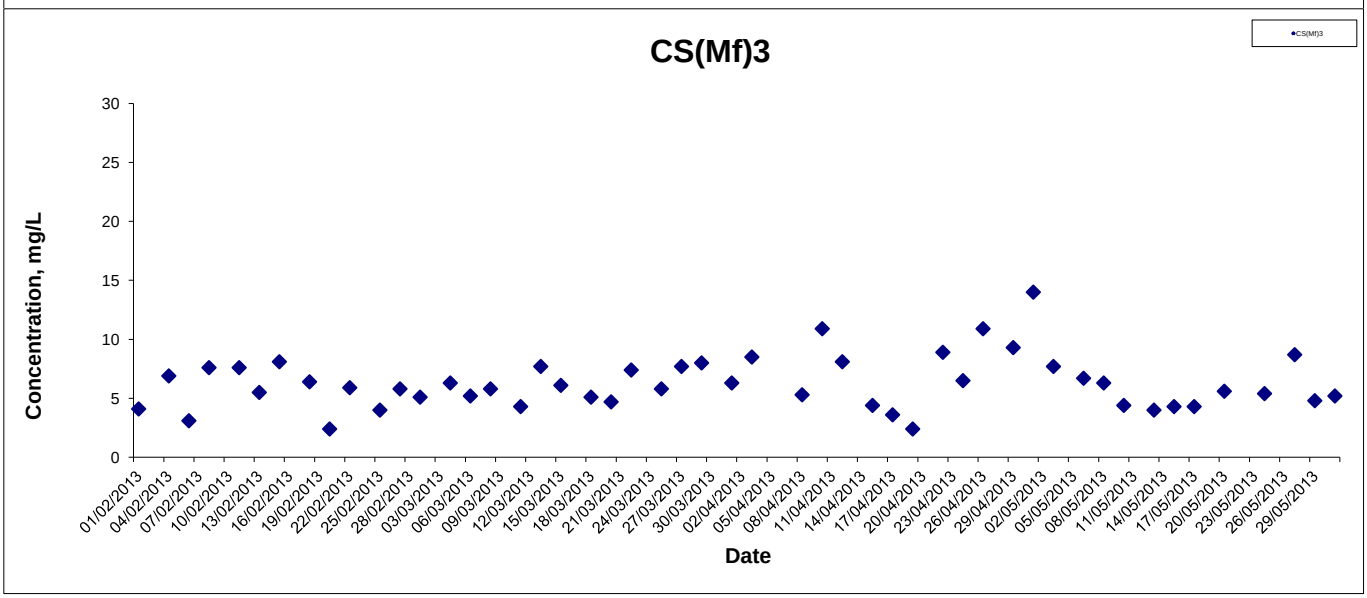

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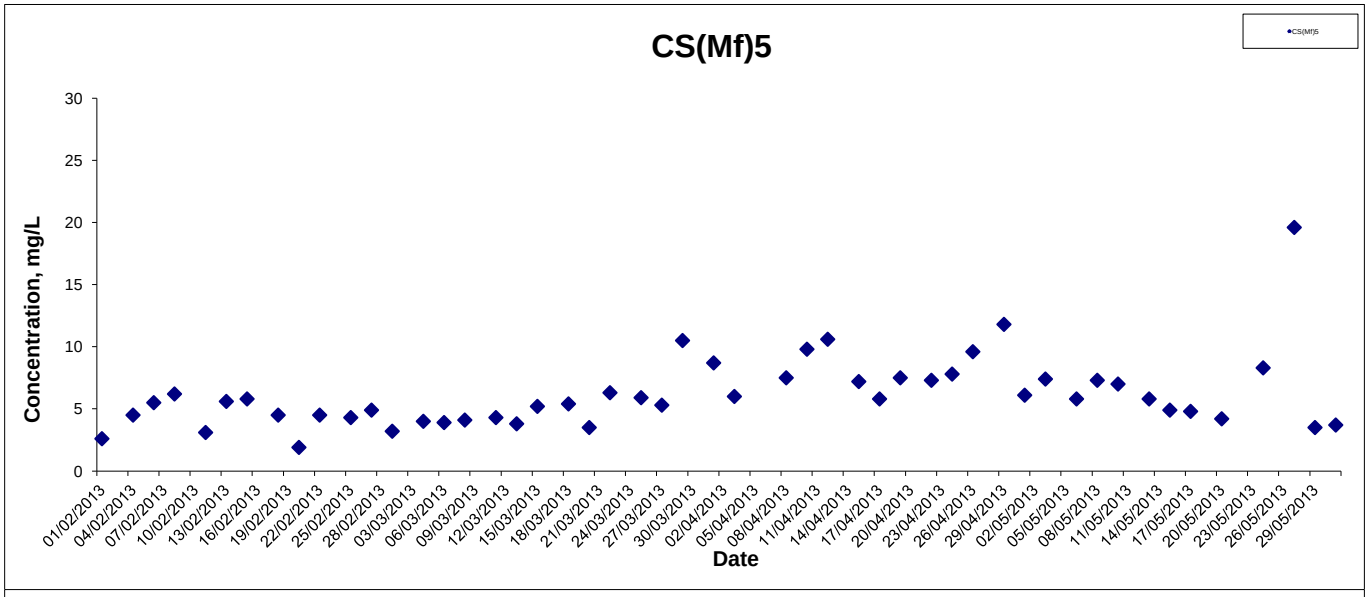

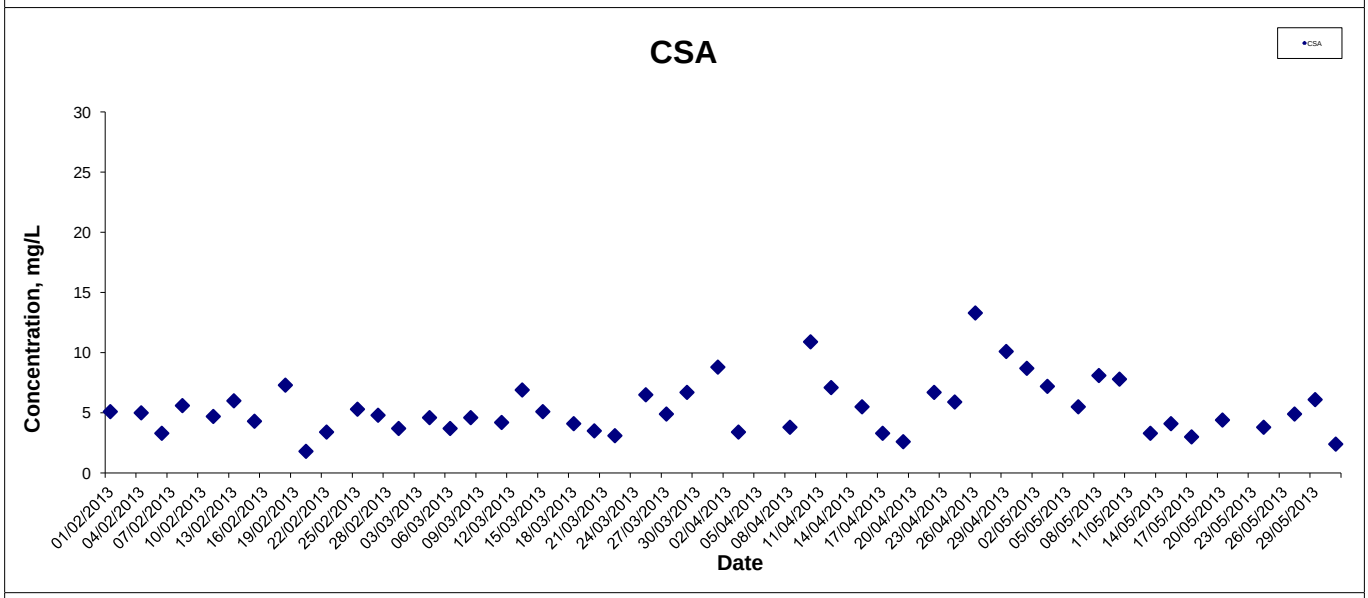

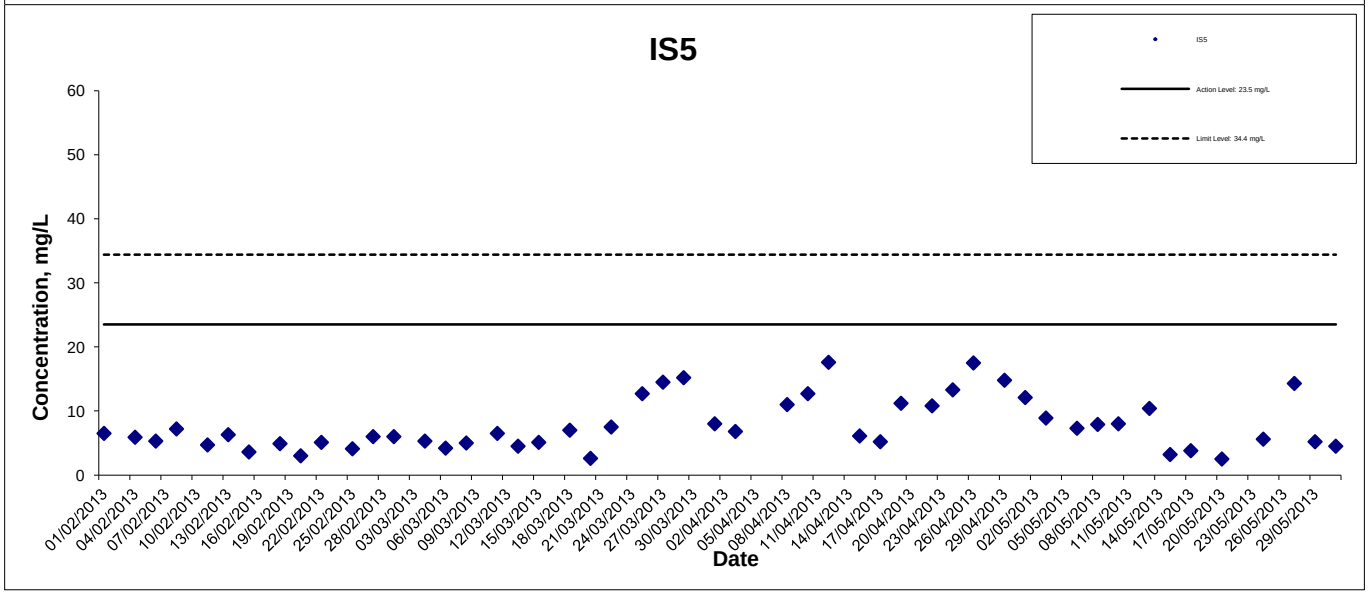

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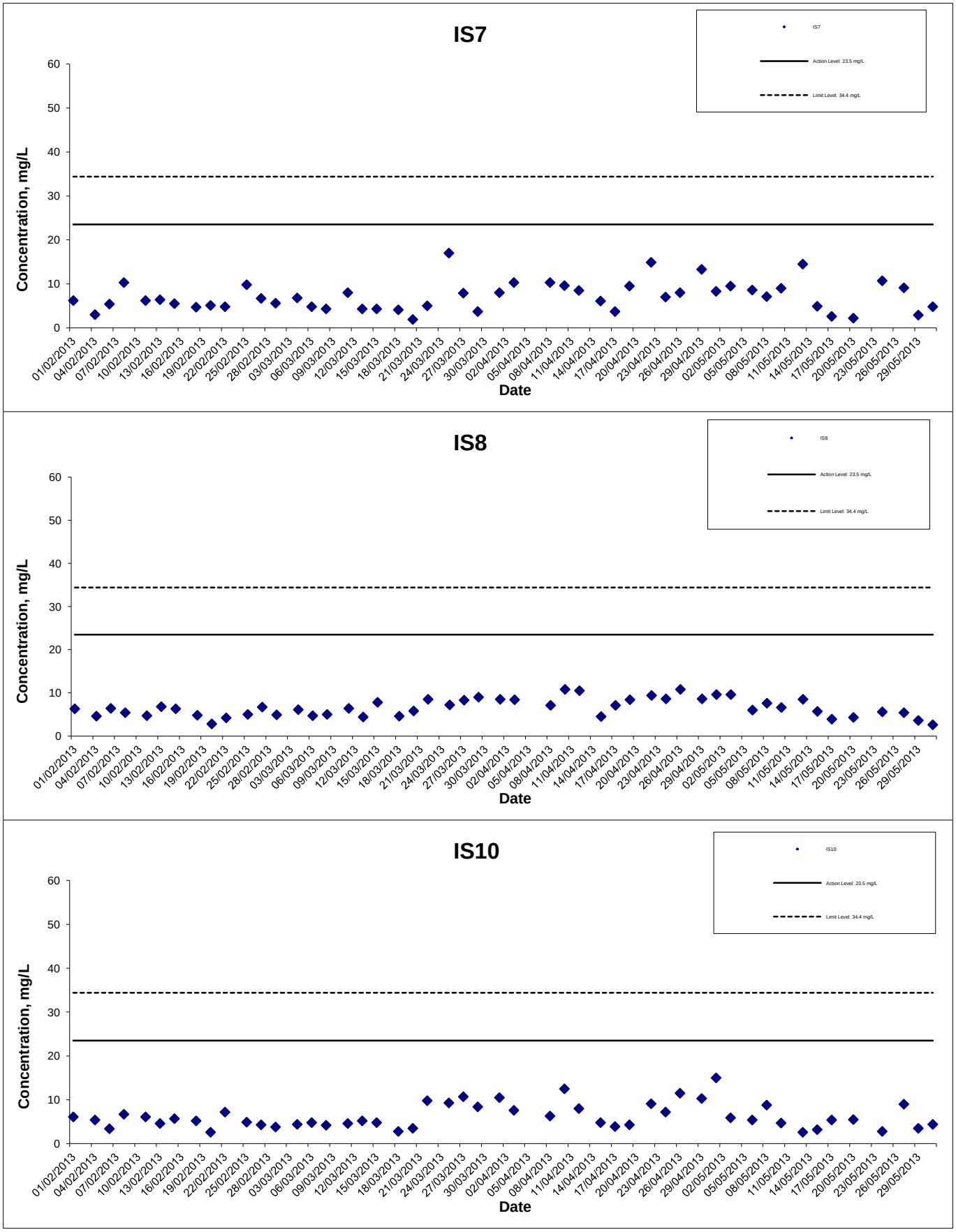

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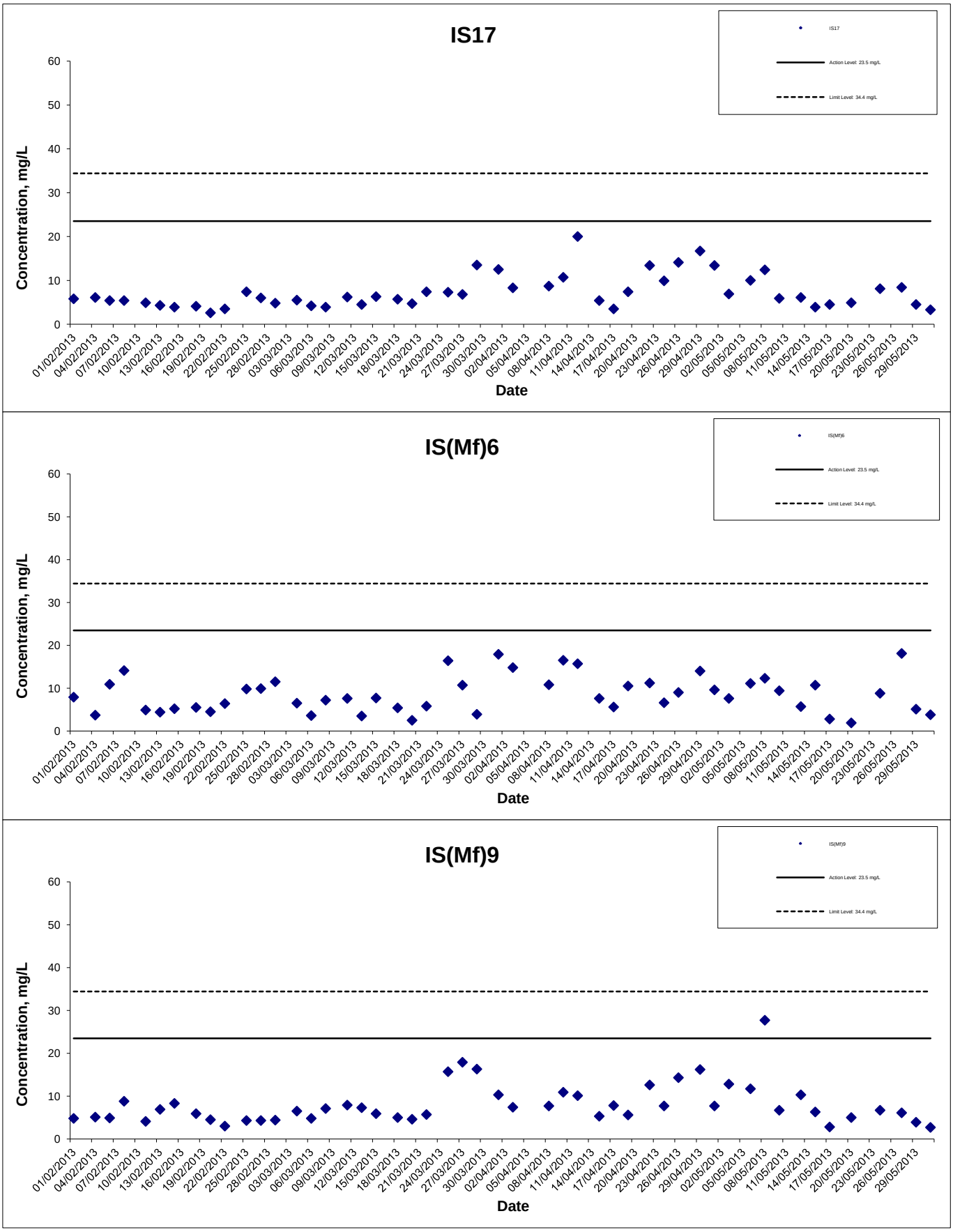

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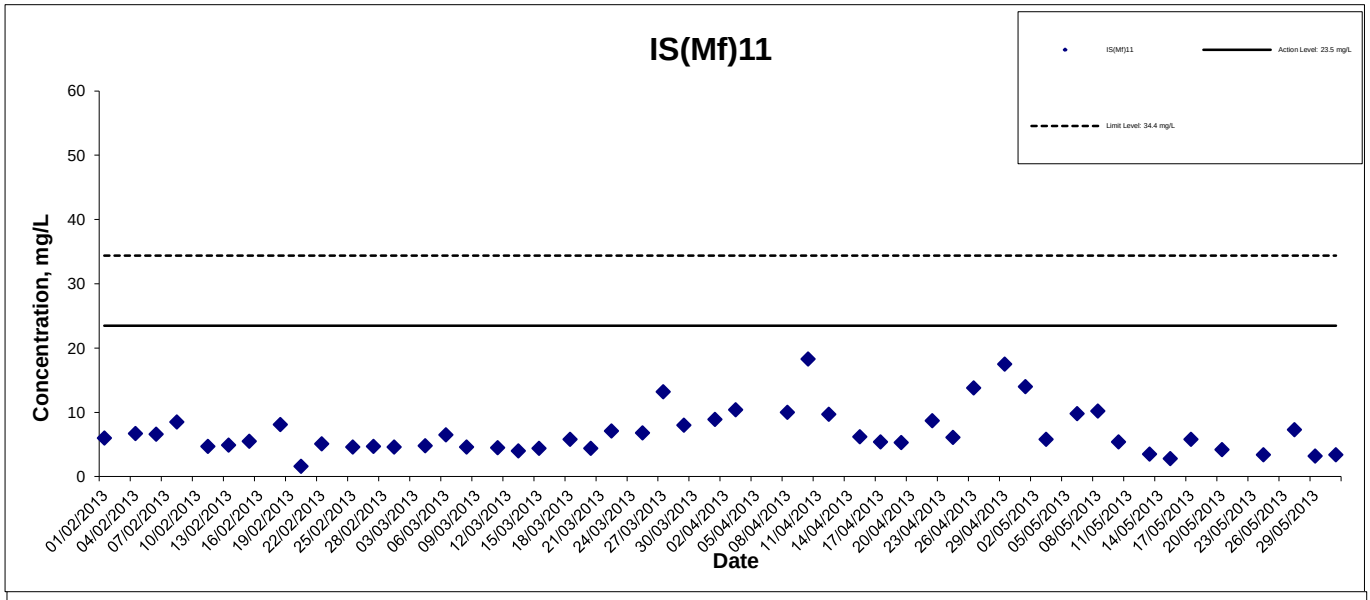

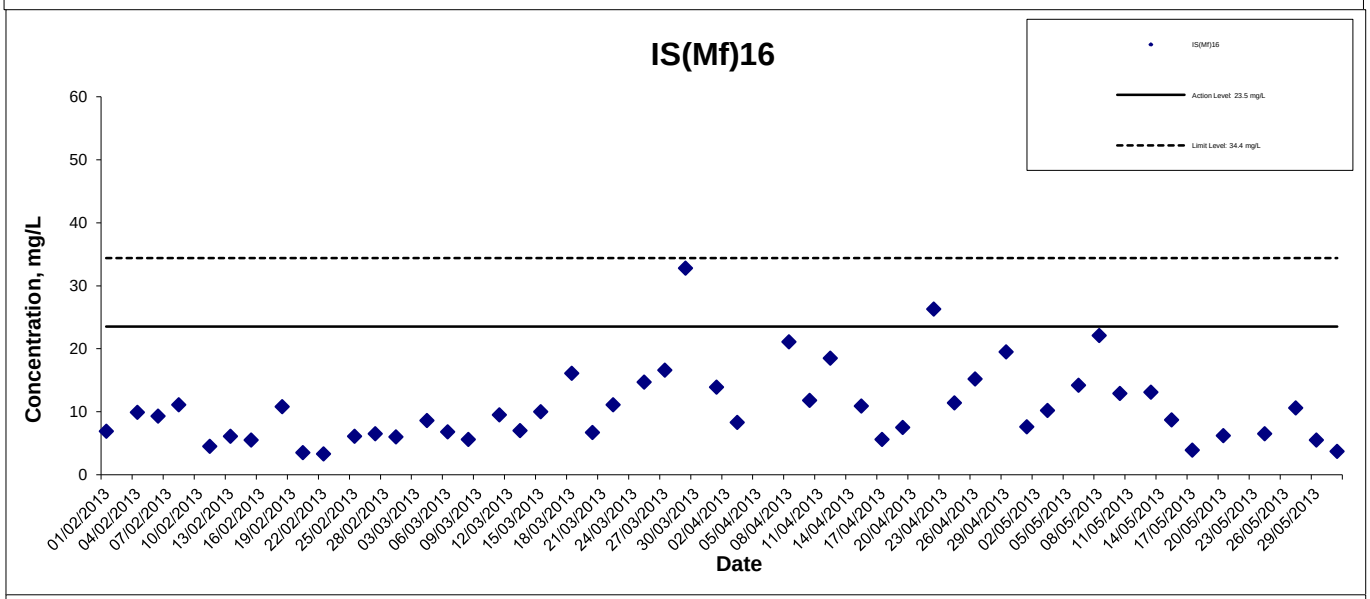

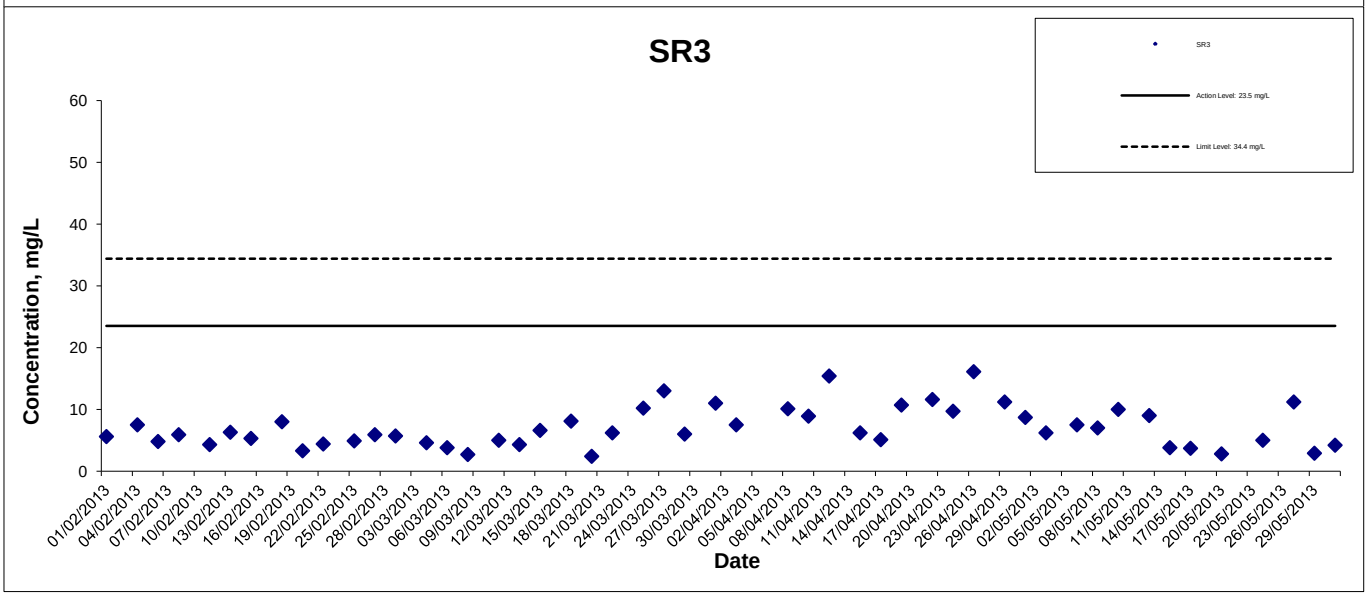

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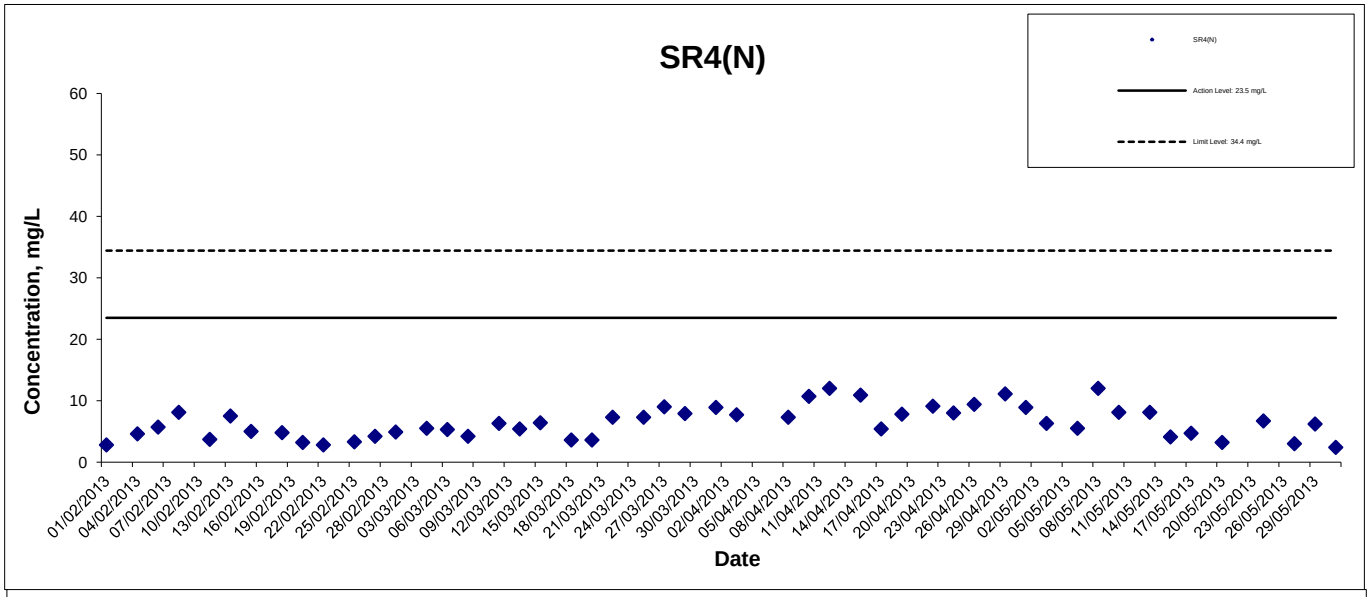

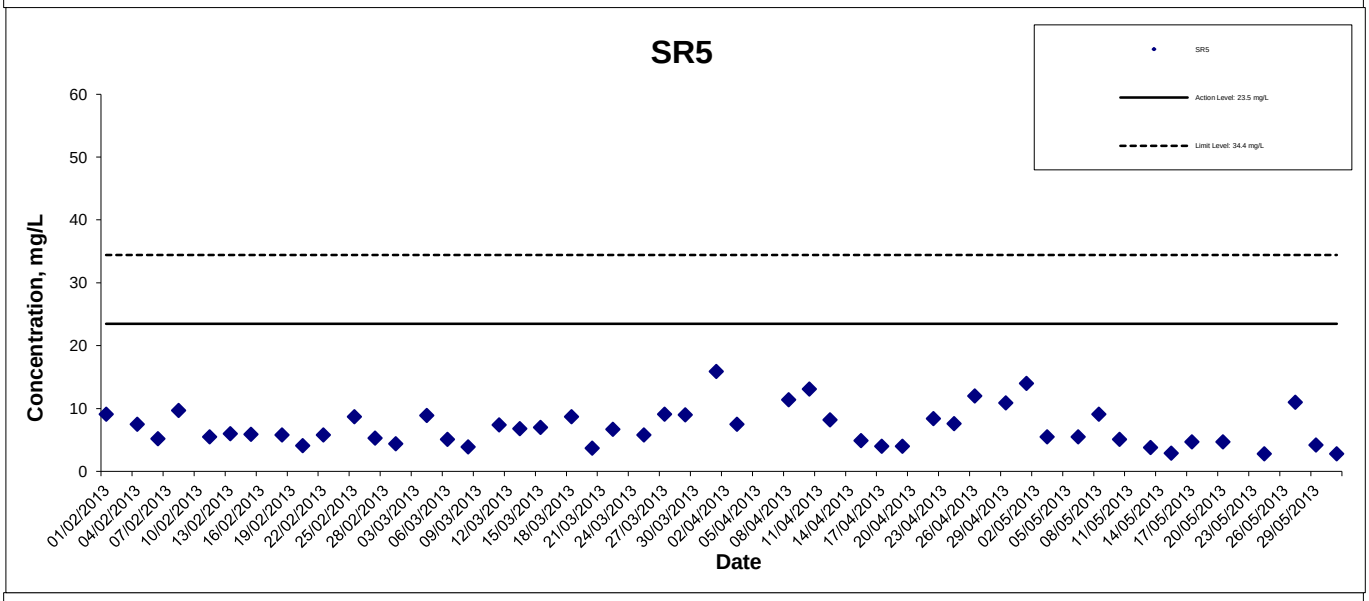

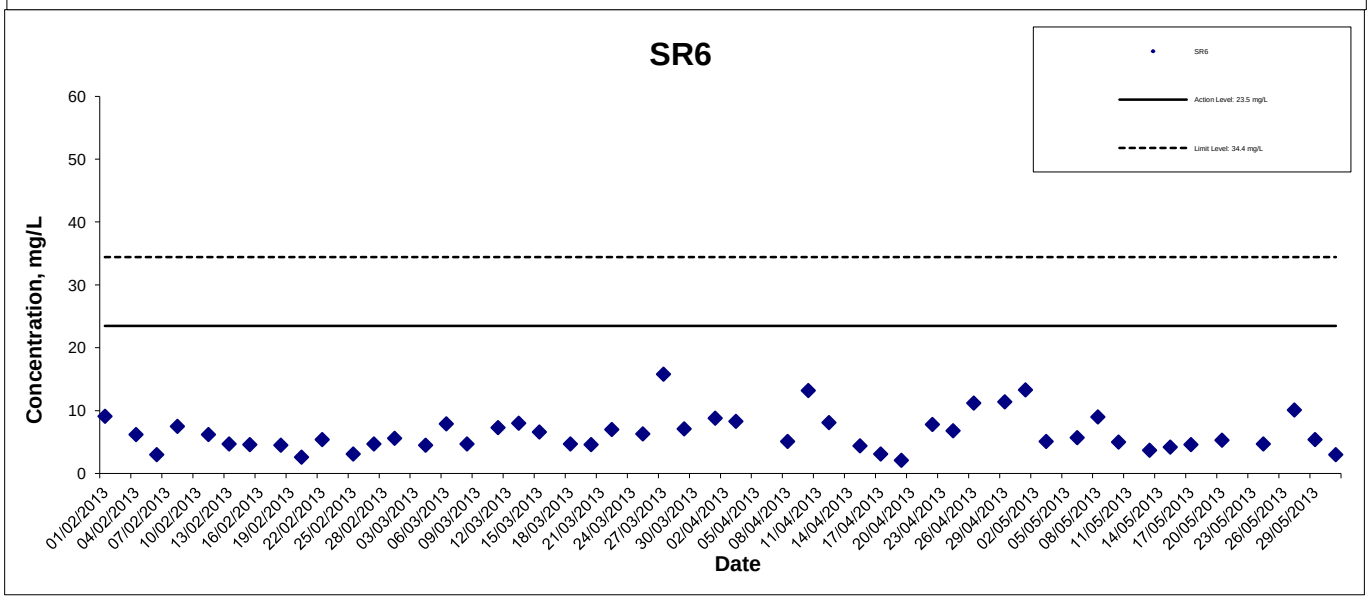

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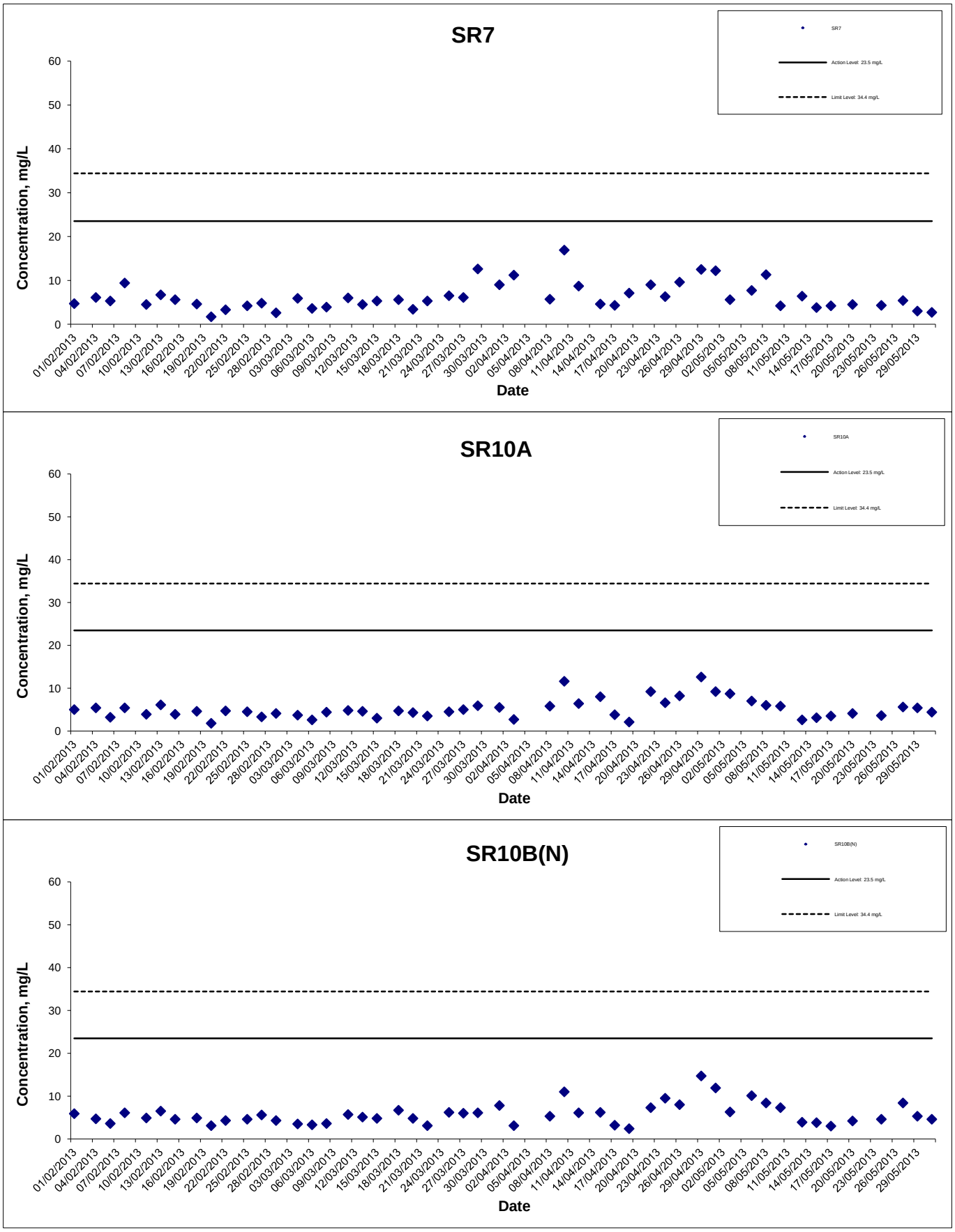

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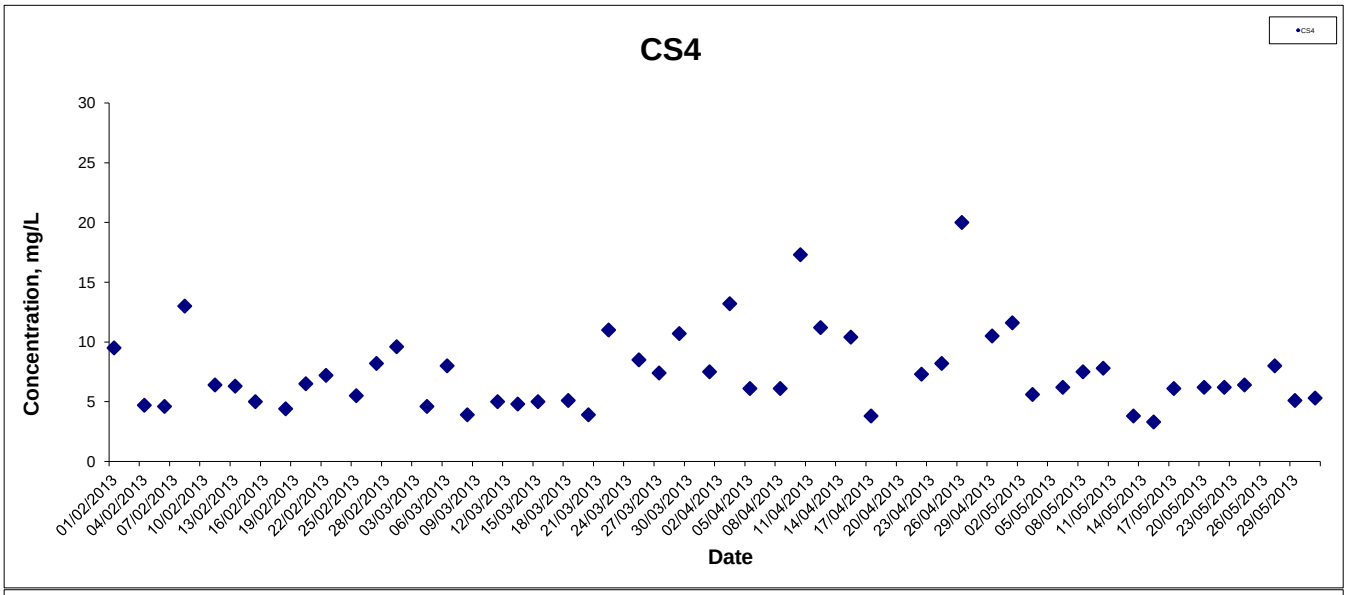

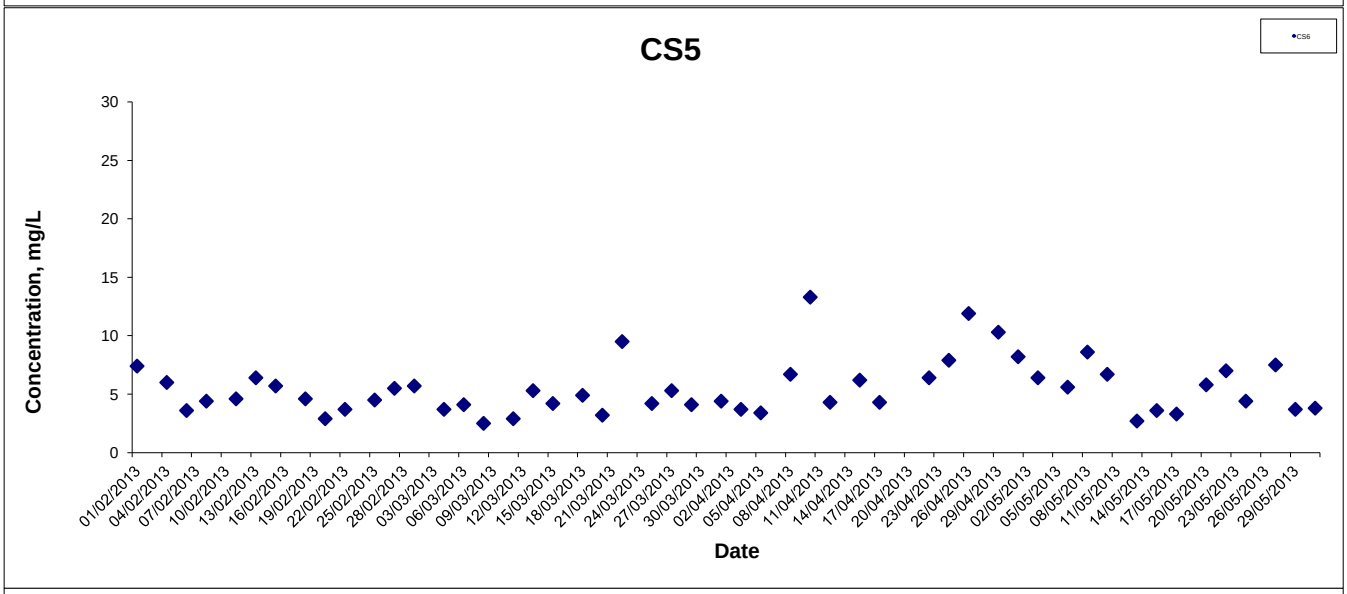

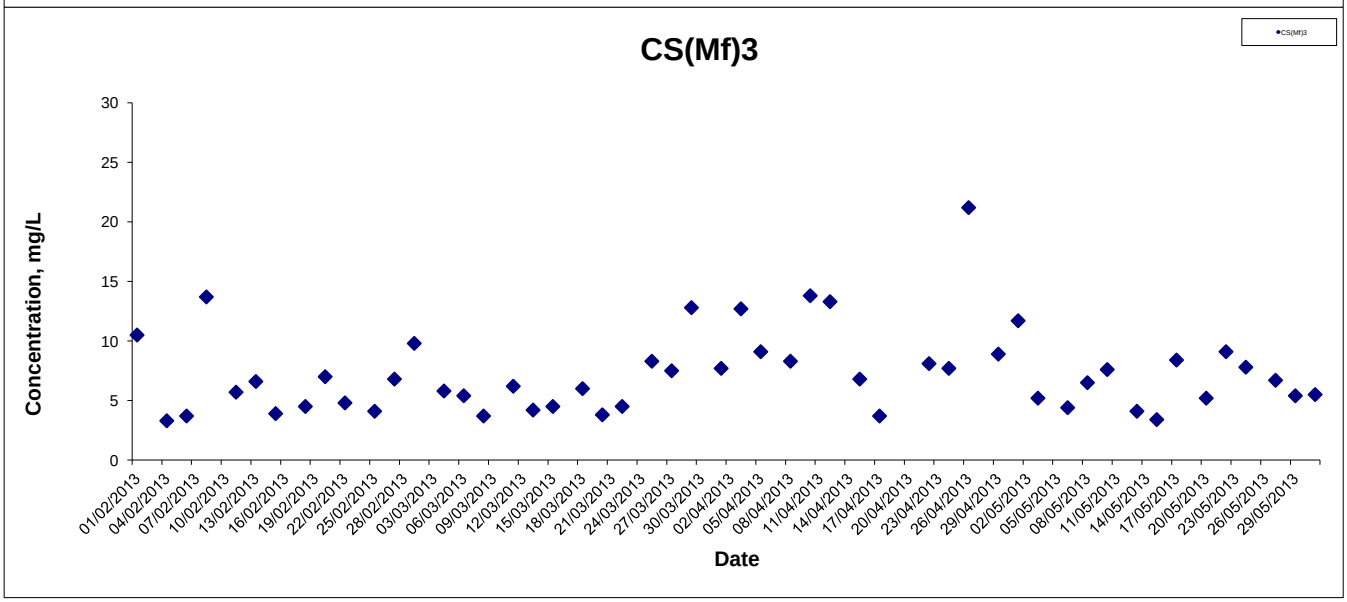

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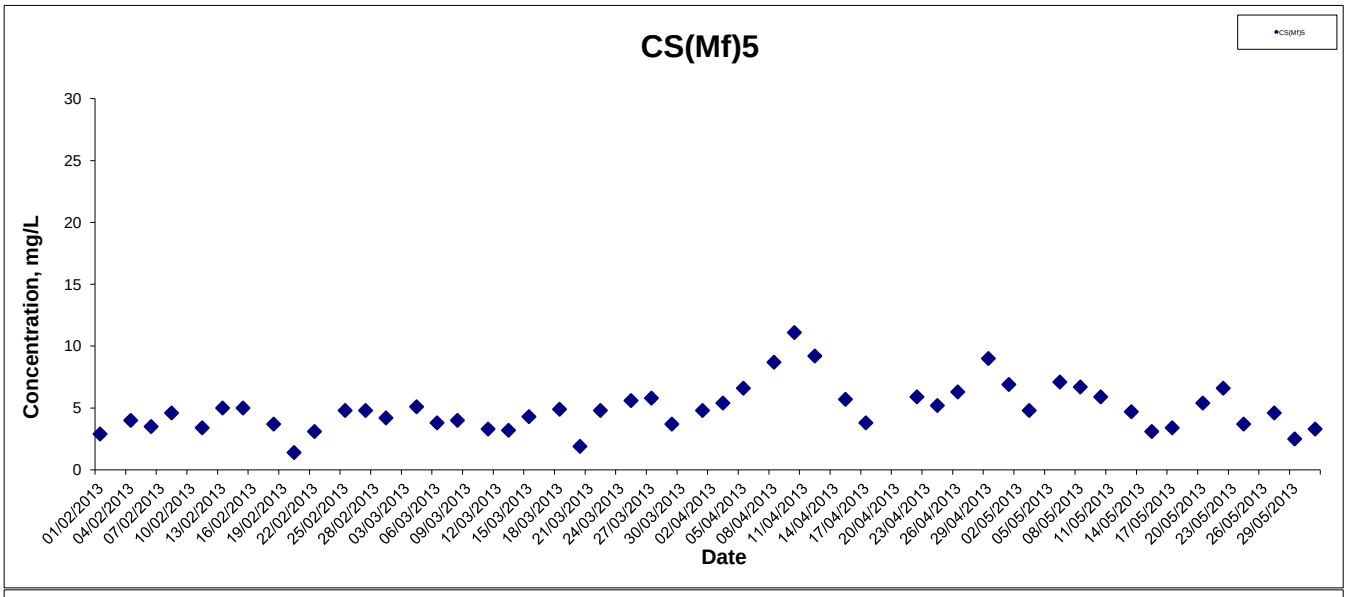

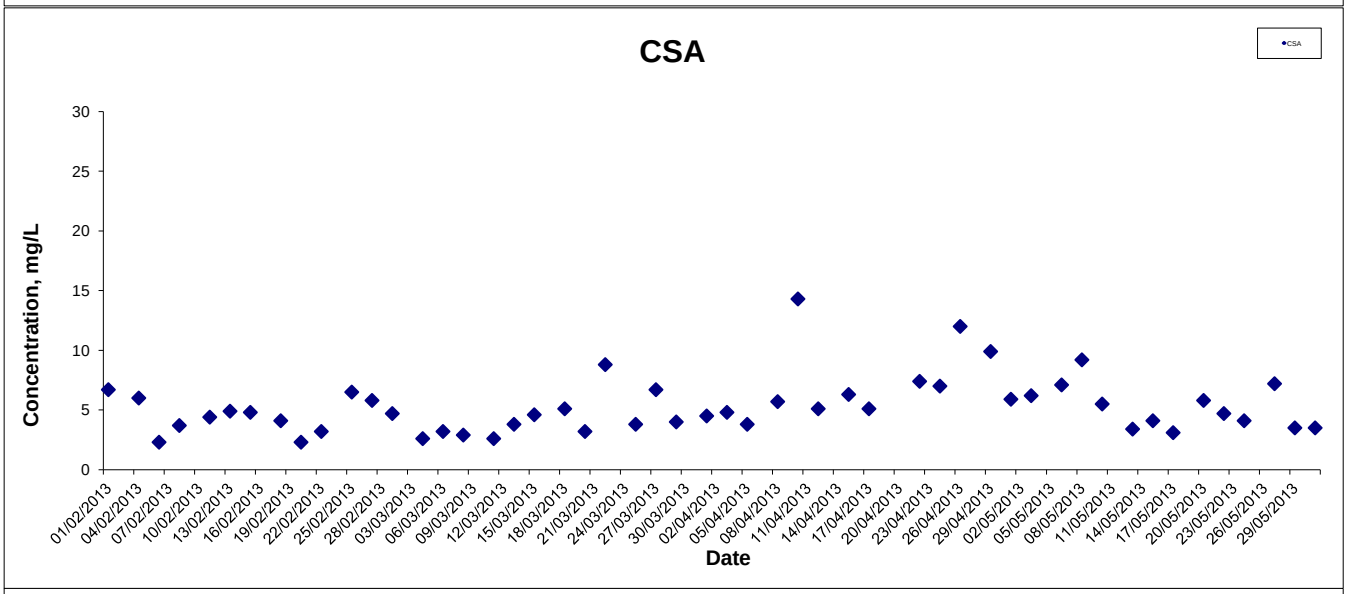

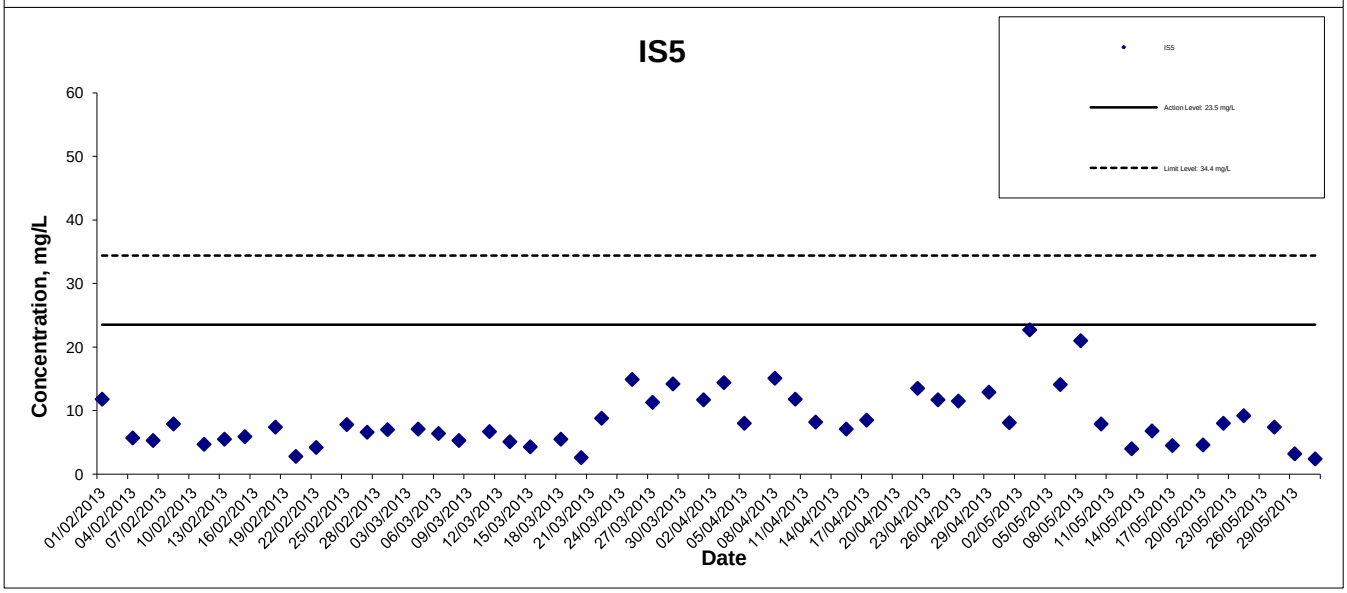

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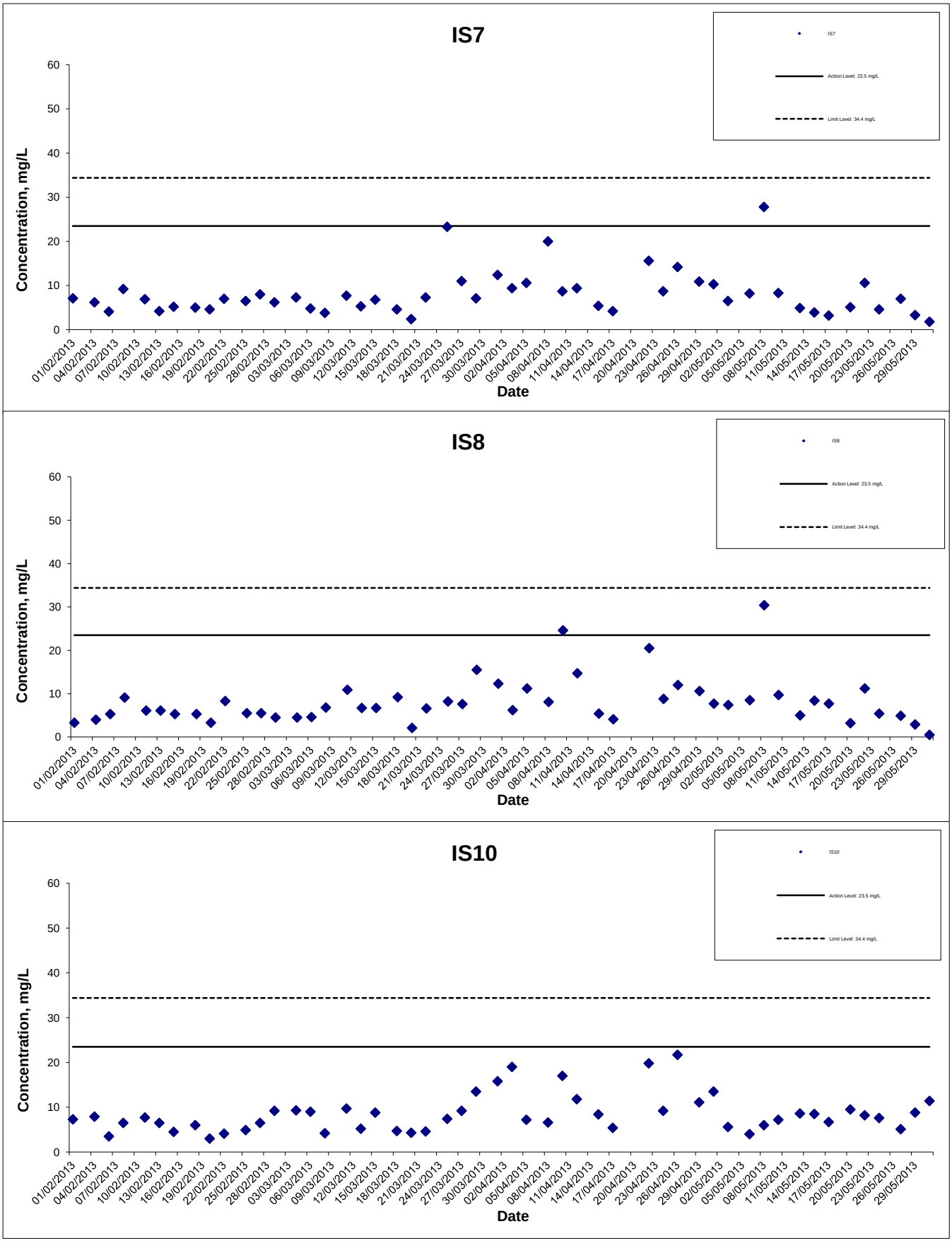

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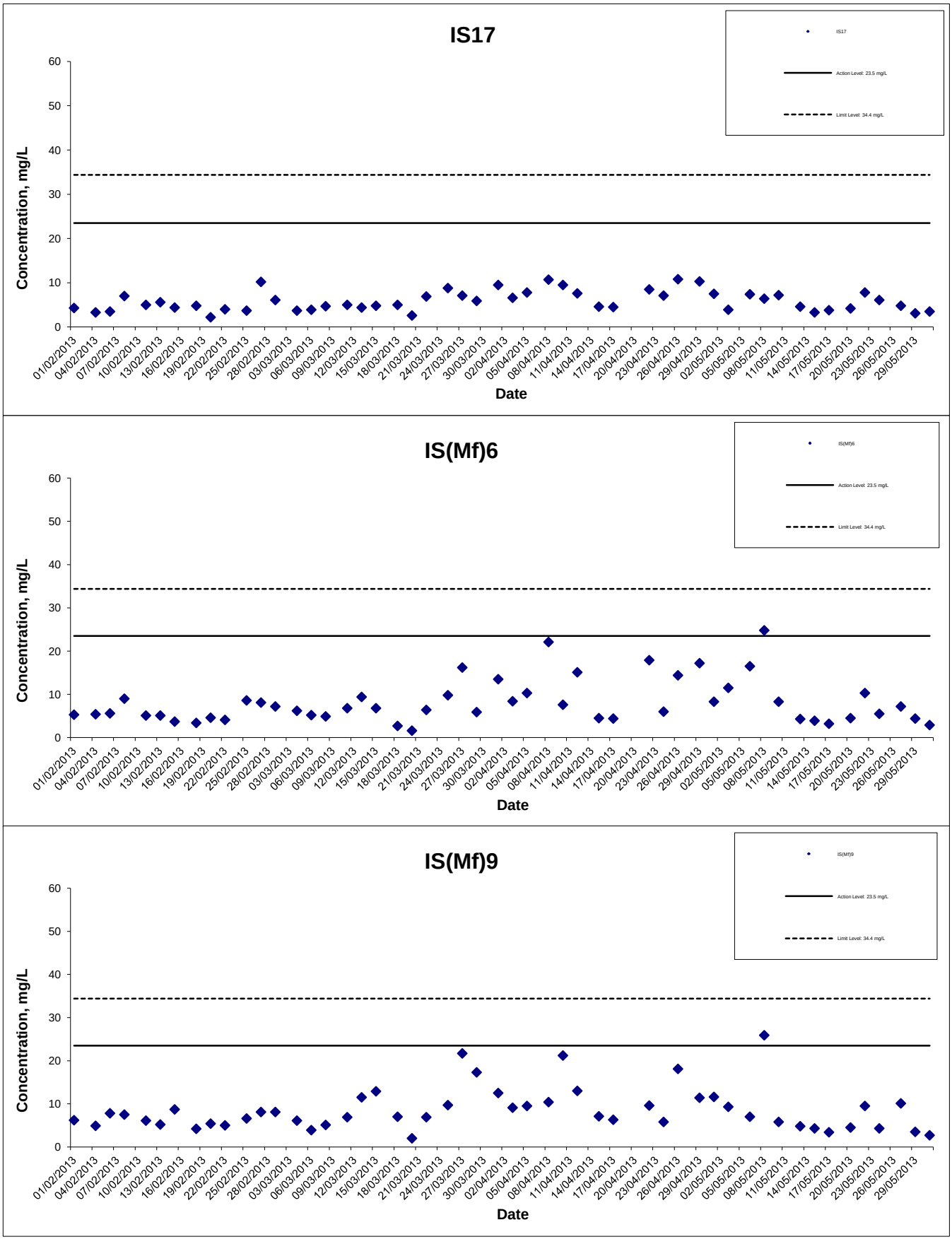

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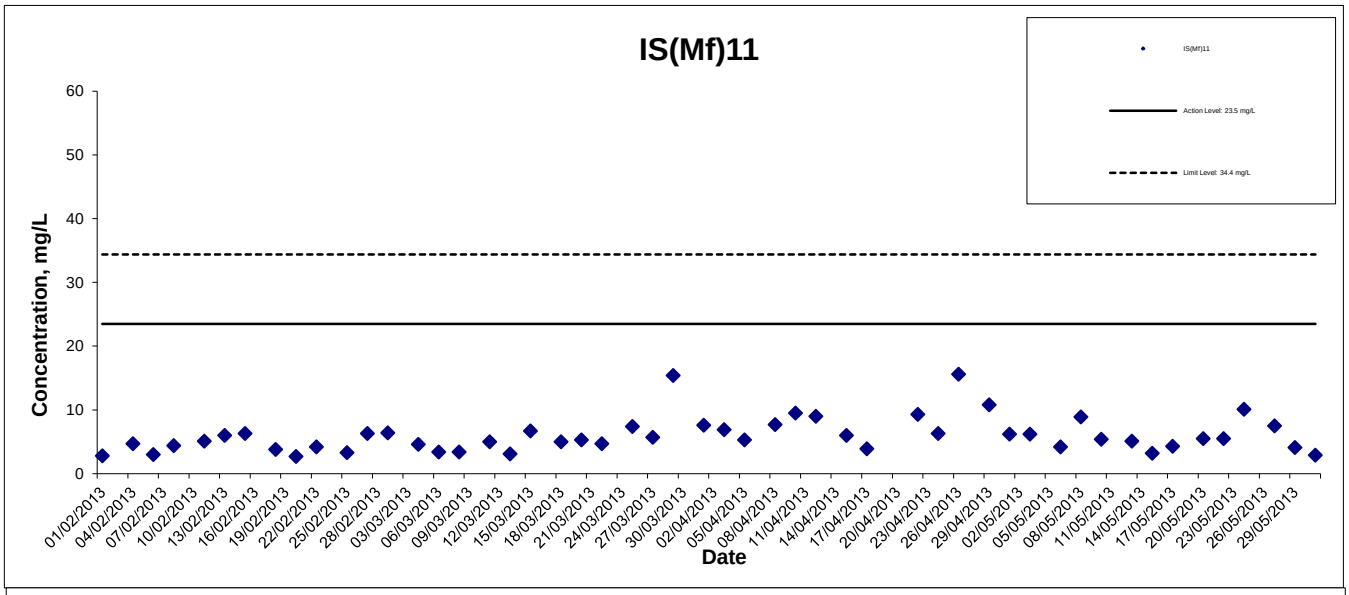

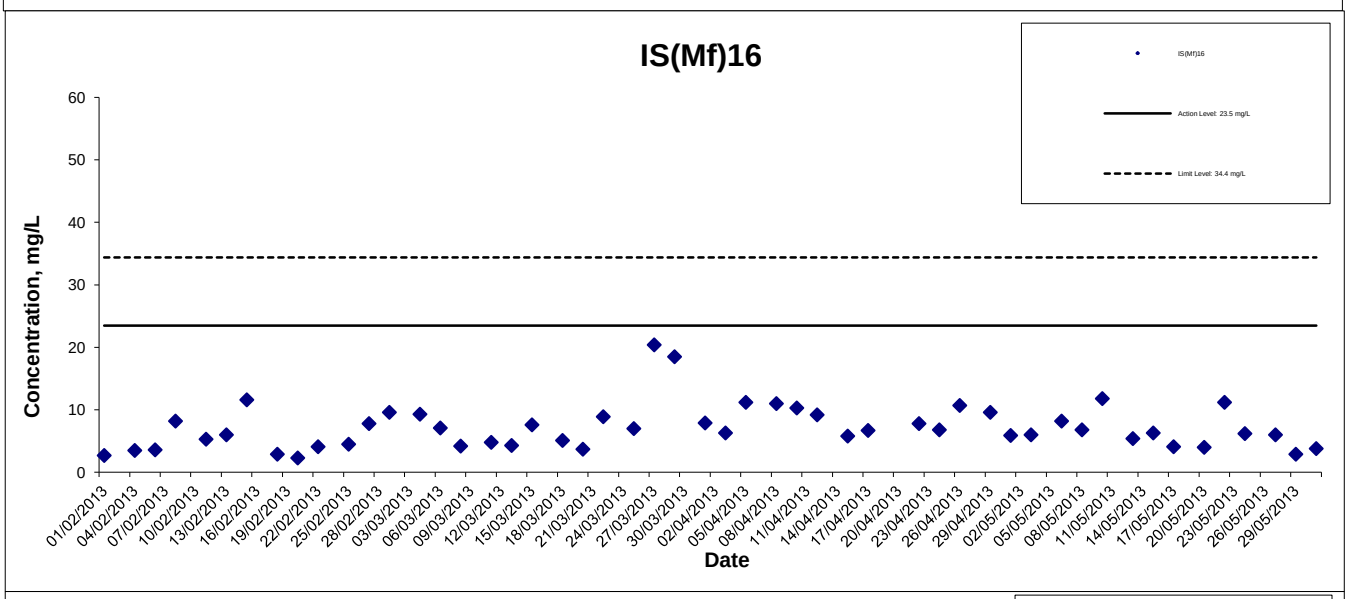

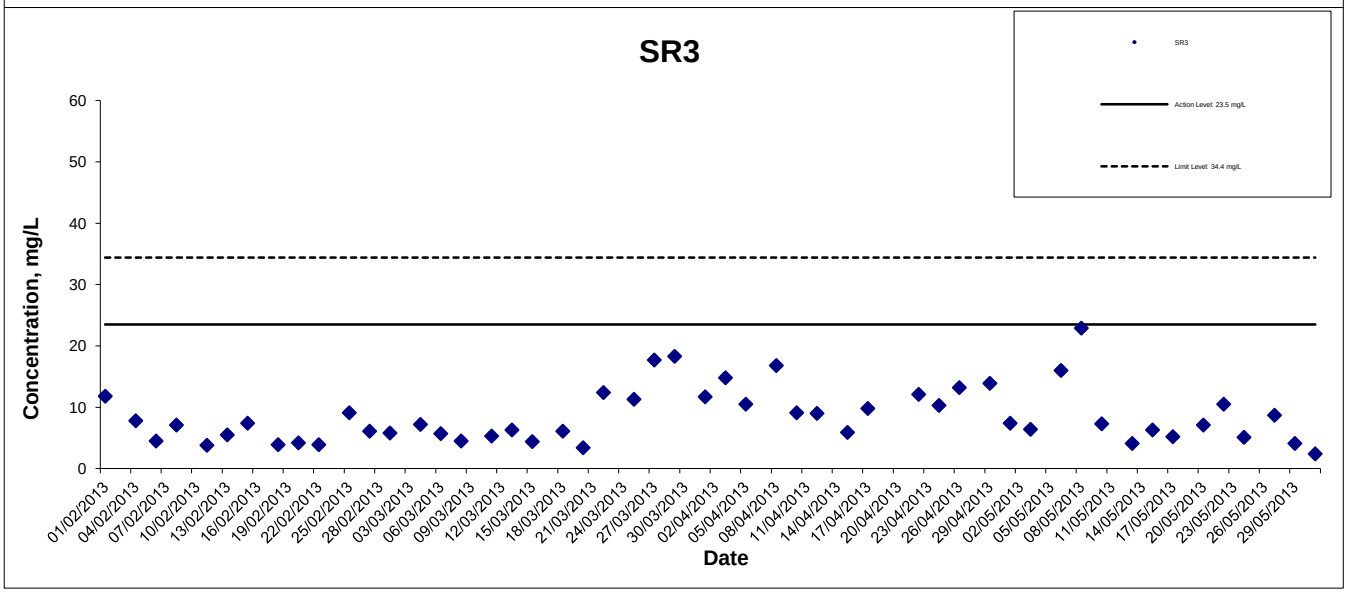

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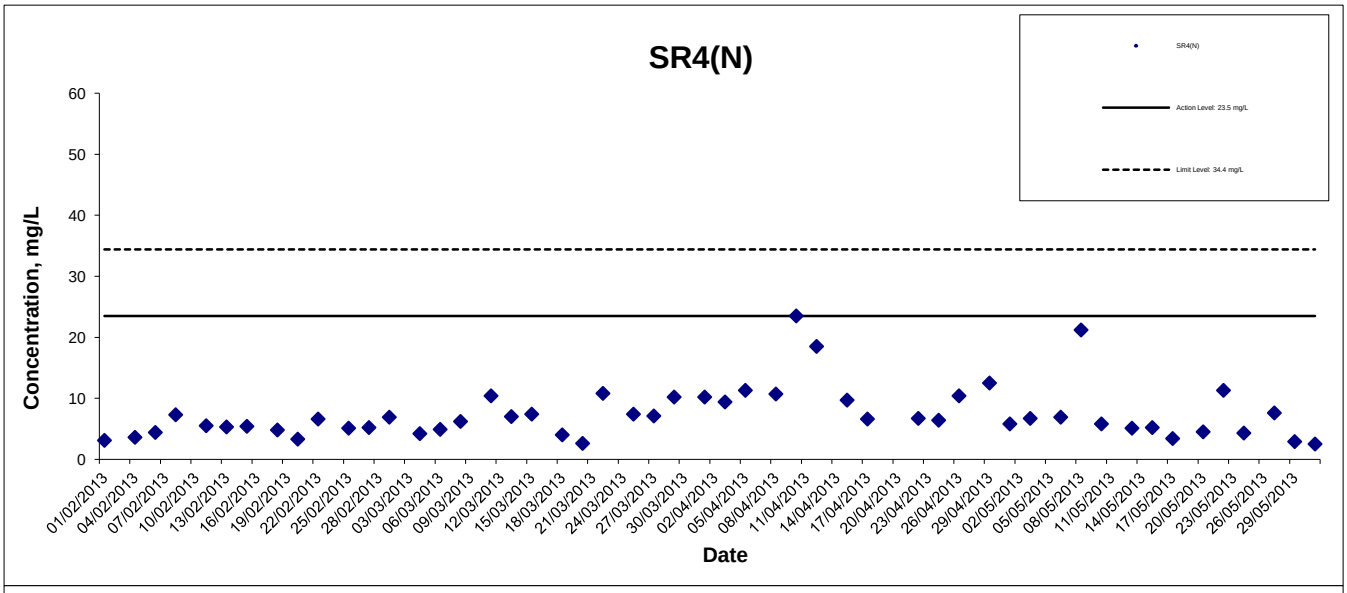

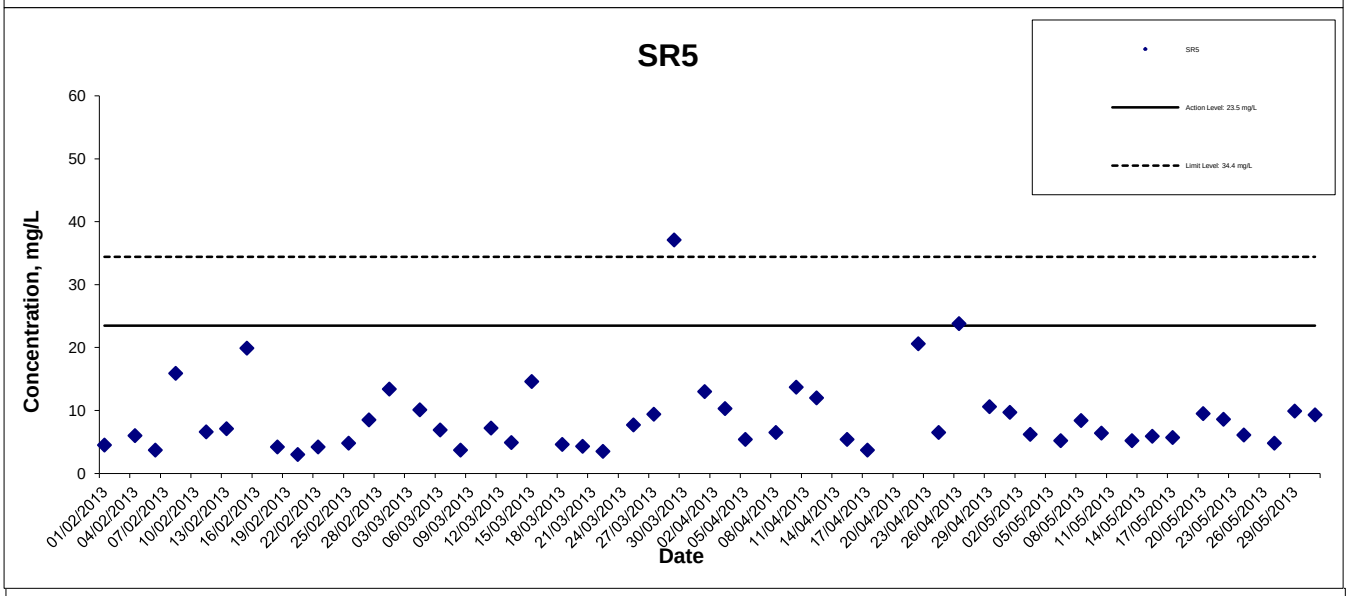

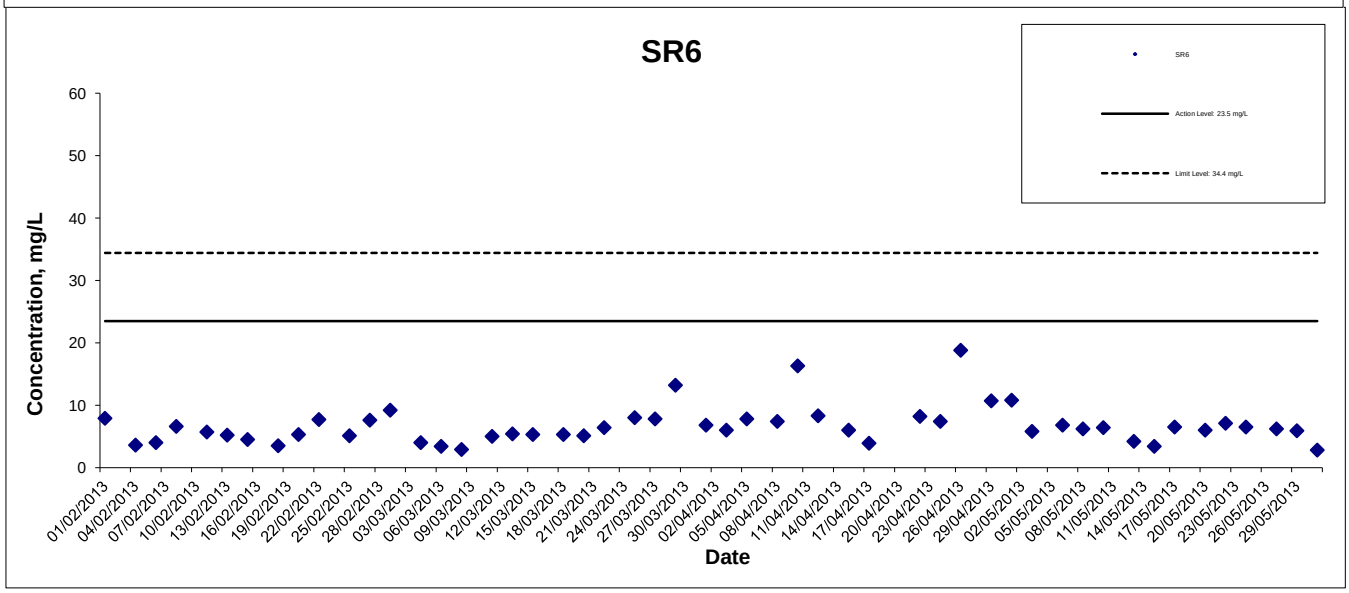

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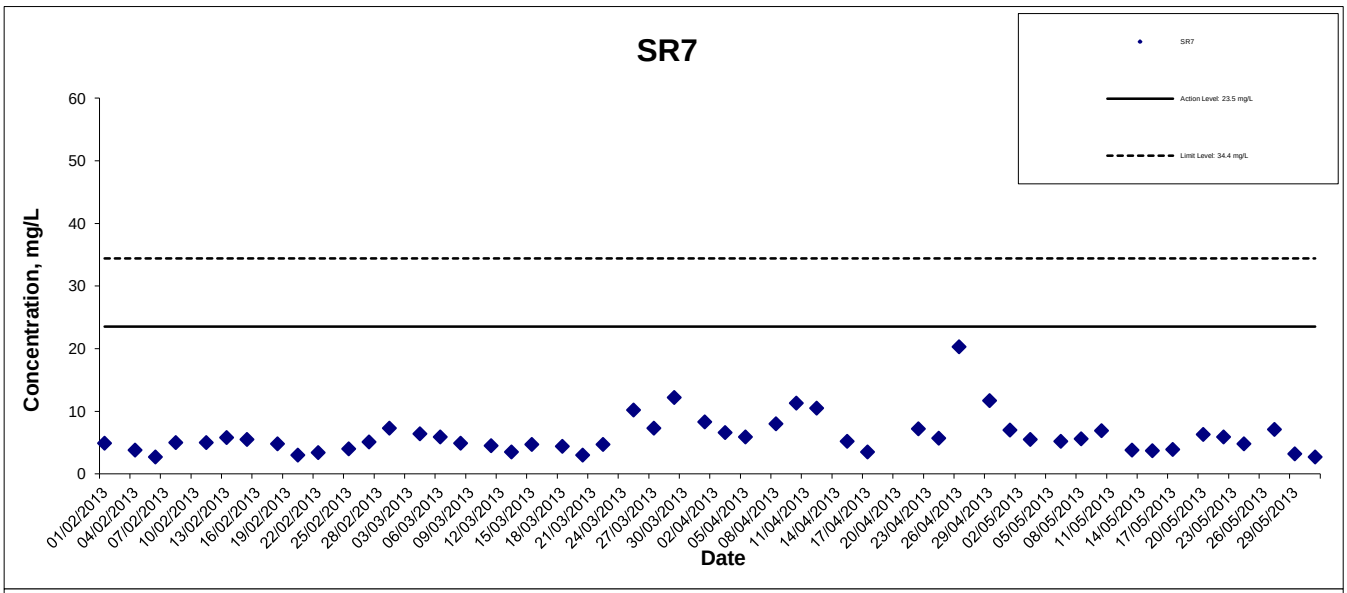

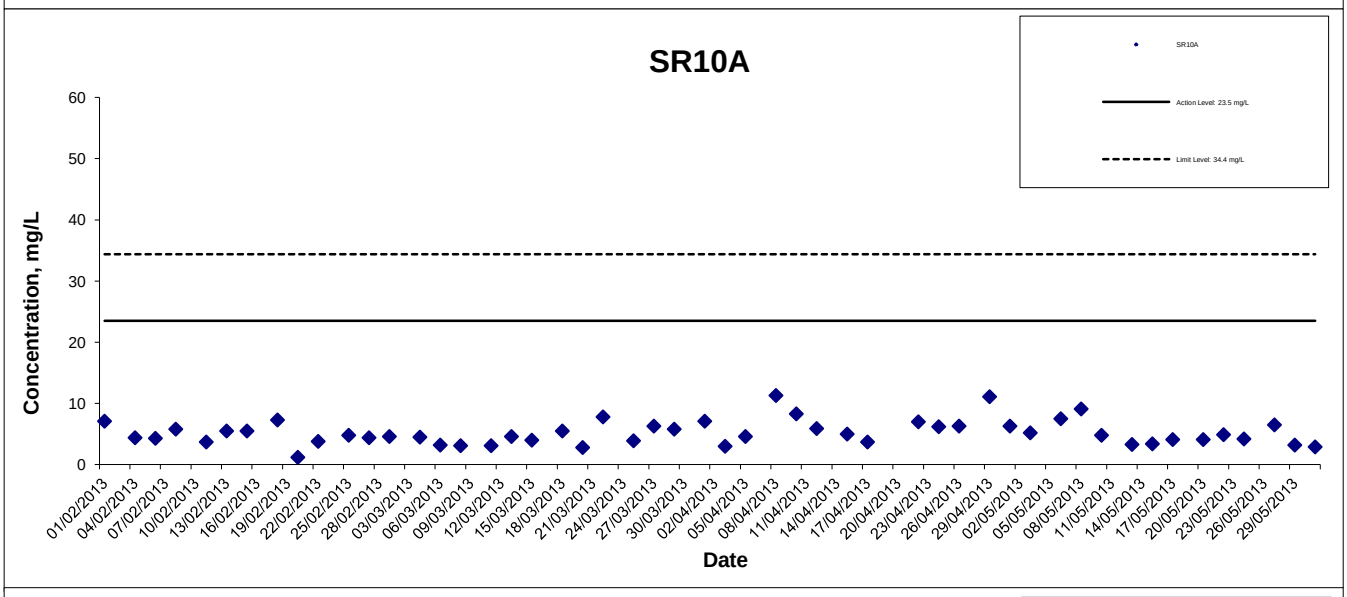

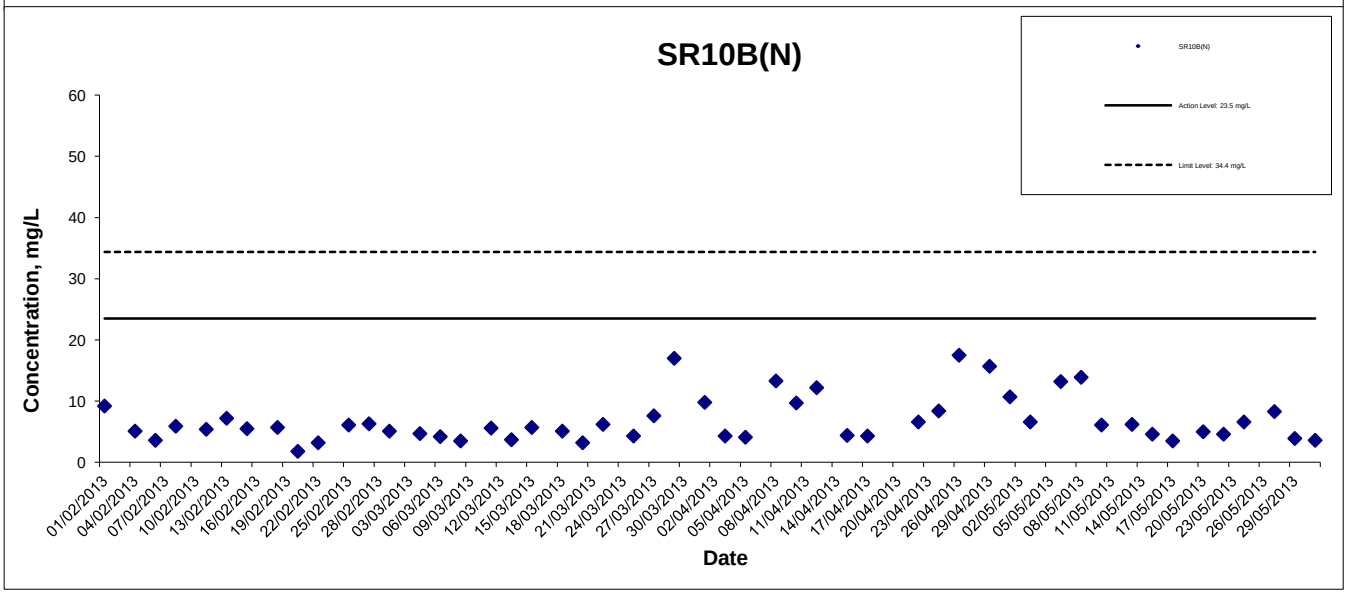

Hong Kong-Zhuhai-Macao Bridge
Hong Kong Boundary Crossing Facilities-Reclamation Works

March - May 2013
Quarterly Report

Dolphin Impact Monitoring

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ANNEXES

1. Introduction

In March 2012, construction for the Hong Kong-Zhuhai-Macao Bridge (HZMB) began in Hong Kong territorial waters. In Hong Kong, the HZMB comprises three projects; the Hong Kong Boundary Crossing Facilities (HKBCF) Project; the Hong Kong Link Road (HKLR) Project and; the Tuen Mun-Chek Lap Kok Link (TM-CLKL) Project. The HKBCF, the first of the HZMB projects to commence in Hong Kong, requires the total reclamation of approximately 149 hectares (ha); which consists of 130 ha for the HKBCF artificial island and 19 ha for the TM-CLKL southern landfall (Fig. 1).

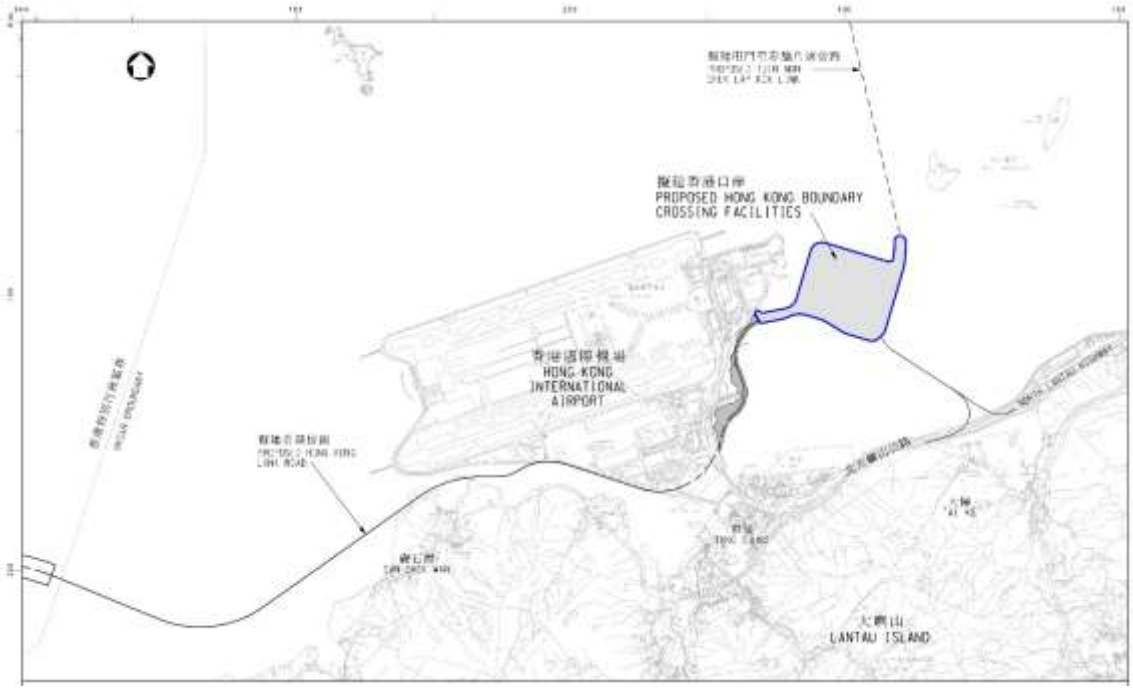

Figure 1. The Hong Kong Boundary Crossing (HKBCF) Reclamation Sites, North Lantau, Hong Kong (www.hzmb.hk/eng/img/overview/about_overview03_p01l.jpg)

The EM&A Manuals and Environmental Permits (EP) associated with all three projects have special provision for Chinese white dolphins (CWD) as they occur regularly in the waters which will be affected by the HZMB development. This report comprises the fifth quarterly (March-May 2013) data associated with the impact monitoring conducted for contract HY/2010/02, HKBCF-Reclamation Works. The format of this report follows as closely as possible the outline provided for the Baseline Monitoring Report. The baseline monitoring was conducted during a different period from this quarter September to November (in 2011) and is thus not directly comparable. Where appropriate, information from the subsequent quarterly reports (March-May 2012, June–August 2012 and September-November 2012, December 2012-February 2013), data provided by the Hong Kong Highways Department (HyD) and data from the Agriculture, Fisheries and Conservation Department (AFCD) Marine Mammal Annual Monitoring reports have also been incorporated[1]

[1] http://www.afcd.gov.hk/english/conservation/con_mar/con_mar_chi/con_mar_chi_chi/con_mar_chi_chi.html

2. OBJECTIVES AND METHODOLOGY

2.1. Objectives of the Present Study

The EM&A Manual for HZMB states that "A dolphin monitoring programme at North Lantau and West Lantau waters, in particular the dolphin sighting hotspots (e.g. Brothers Islands) and areas where juveniles have been sighted (e.g. West Lantau waters), should be set up to verify the predictions of impacts and to ensure that there are no unforeseen impacts on the dolphin population during construction phase". For HKBCF the study area known as West Lantau was not included in the site specific EM&A Manual for construction phase survey work. As such, for HKBCF, vessel-based dolphin surveys to monitor impact are conducted in the areas known as Northeast Lantau (NEL) and Northwest Lantau (NWL). These surveys are conducted twice monthly and for the duration of the construction phase of HKBCF. The HZMB baseline study (incorporating HKBCF, TM-CLK and HKLR phases of the bridge development), indicates that the data gathered from these surveys are intended to monitor impacts by;

providing ongoing assessment of the spatial and temporal distribution patterns and habitat use of CWD during the construction phase of the HKBCF project.

identifying individual CWD by their natural marks, coloration and scars for comparison with the baseline data and to assess individual distribution patterns and habitat use.

comparing impact survey data to that gathered during the baseline data period so that any changes deemed to be of a significant nature can be assessed and mitigated appropriately.

The baseline monitoring report includes distribution analysis, encounter rate analysis, behavioural analysis, quantitative grid analysis and ranging pattern analysis. Protocols for data interpretation and analyses methods were provided in the baseline monitoring report.

2.2. Line-transect Vessel Surveys

The co-ordinates for the transect lines and layout map were provided by AFCD, however, these have been modified as the construction works at HKBCF has shortened one of the transect lines (Table 1; Figure 2). The study area now incorporates 23 transects (totalling ~111km) which are surveyed twice per month by boat. Line transect surveys should be conducted systematically and lines travelled in sequence (Buckland *et al* 2001). When the start of a transect line is reached, "on effort" survey begins. When the vessel is travelling between transect lines and to and from the study area, it is deemed to be "off effort". The transect line is surveyed at a speed of 7-8 knots (13-15 km/hr). During some periods, tide and current flow in the study site exceeds 7 knots and thus the vessel travels at the same speed as the current during these periods. A minimum of four marine mammal observers (MMOs) are present on each survey, rotating through four positions; observers (2), data recorder (1) and rest (1). Rotations occur every 30 minutes or at the end of dolphin sightings. The data recorder enters vessel effort, observer effort, weather and sightings information directly onto the programme Logger[2] and is not part of the observer team. This is not standard line transect survey procedure as usually a minimum of three observers are required to assure that the assumptions underlying line transect theory are not violated, however, this was the way in which the baseline study was conducted and it has been requested that only two observers be used for impact surveys.

[2] Logger is purpose built software which automatically collects and stores GPS data and contains a user configurable interface for the manual entry of the data required for line transect and other cetacean research studies (Gillespie *et al* 2010).

When the boat is travelling along the transect line ("on effort"), observers search the area in front of the boat between 90° and 270° abeam (bow being 0°). When a group of dolphins is sighted, position, bearing and distance data are recorded immediately onto Logger and, after a short observation, an estimate is made of group size[3]. This is an "on effort" sighting. These input parameters are linked to the time-GPS-ships data which are automatically stored in the programme Logger throughout the survey period. In this manner, information on heading, position, speed, weather, effort and sightings are stored in an interlinked database which can be subsequently used in a variety of analytical software packages.
Once the vessel leaves the transect line, it is deemed to be "off-effort". The dolphins are approached with the purpose of taking high resolution images. Then the vessel returns to the transect line at the point of departure and is again "on effort". If another group of dolphins is seen while travelling back to the transect line, or when with the first group of dolphins, the sightings are considered as "opportunistic" and noted accordingly.

2.2.1 Baseline Survey Data and Data from 2011

Data from the baseline and 2011 has been provided by (Highways Department, January 2013. Provided in excerpt form as Annex I). Using the data set provided, encounter rates are calculated using on effort sightings made under favourable conditions only. Calculations derivation are clearly marked in the tables presented. For the data collected for this quarterly report, the sightings table is included as Annex II.

[3] Group size is defined as an aggregation of dolphins within 100m of each other involved in similar behaviour (Connor *et al* 1998).

Table 1. The Dolphin Monitoring Transect Co-Ordinates for HKBCF Monthly Monitoring

ID	x	y	Long	Lat	ID	x	y	Long	Lat
1	804671	814577	113.870308	22.269741	12	815542	824882	113.975647	22.362962
1	804671	831404	113.869975	22.421696	13	816506	819480	113.985072	22.314192
2	805475	815457	113.878087	22.277704	13	816506	824859	113.985005	22.362771
2	805477	826654	113.877896	22.378814	14	817537	820220	113.995070	22.320883
3	806464	819435	113.887615	22.313643	14	817537	824613	113.995018	22.360556
3	806464	822911	113.887550	22.345030	15	818568	820735	114.005071	22.325550
4	807518	819771	113.897833	22.316697	15	818568	824433	114.005030	22.358947
4	807518	829230	113.897663	22.402113	16	819532	821420	114.014420	22.331747
5	808504	820220	113.907397	22.320761	16	819532	824209	114.014390	22.356933
5	808504	828602	113.907252	22.396462	17	820451	822125	114.023333	22.338117
6	809490	820466	113.916965	22.323003	17	820451	823671	114.023317	22.352084
6	809490	825352	113.916884	22.367128	18	821504	822371	114.033556	22.340353
7	810499	820690	113.926752	22.325043	18	821504	823761	114.033544	22.352903
7	810499	824613	113.926688	22.360464	19	822513	823268	114.043340	22.348458
8	811508	820847	113.936539	22.326475	19	822513	824321	114.043331	22.357971
8	811508	824254	113.936486	22.357241	20	823477	823402	114.052695	22.349680
9	812516	820892	113.946329	22.326894	20	823477	824613	114.052686	22.360610
9	812516	824254	113.946279	22.357255	21	805476	827081	113.877878	22.382668
10	813525	818270	113.956156	22.303225	21	805476	830562	113.877811	22.414103
10*	813525	824657	113.956065	22.360912	22	806464	824033	113.887520	22.355164
11	814556	818449	113.966160	22.304858	22	806464	829598	113.887416	22.405423
11	814556	820992	113.966125	22.327820	23	814559	821739	113.966142	22.334574
12	815542	818807	113.975726	22.308109	23	814559	824768	113.966101	22.361920

*Transect 10 is now 3.6km in length due to the HKBCF construction site. The total transect length for both NEL and NWL combined is 111km

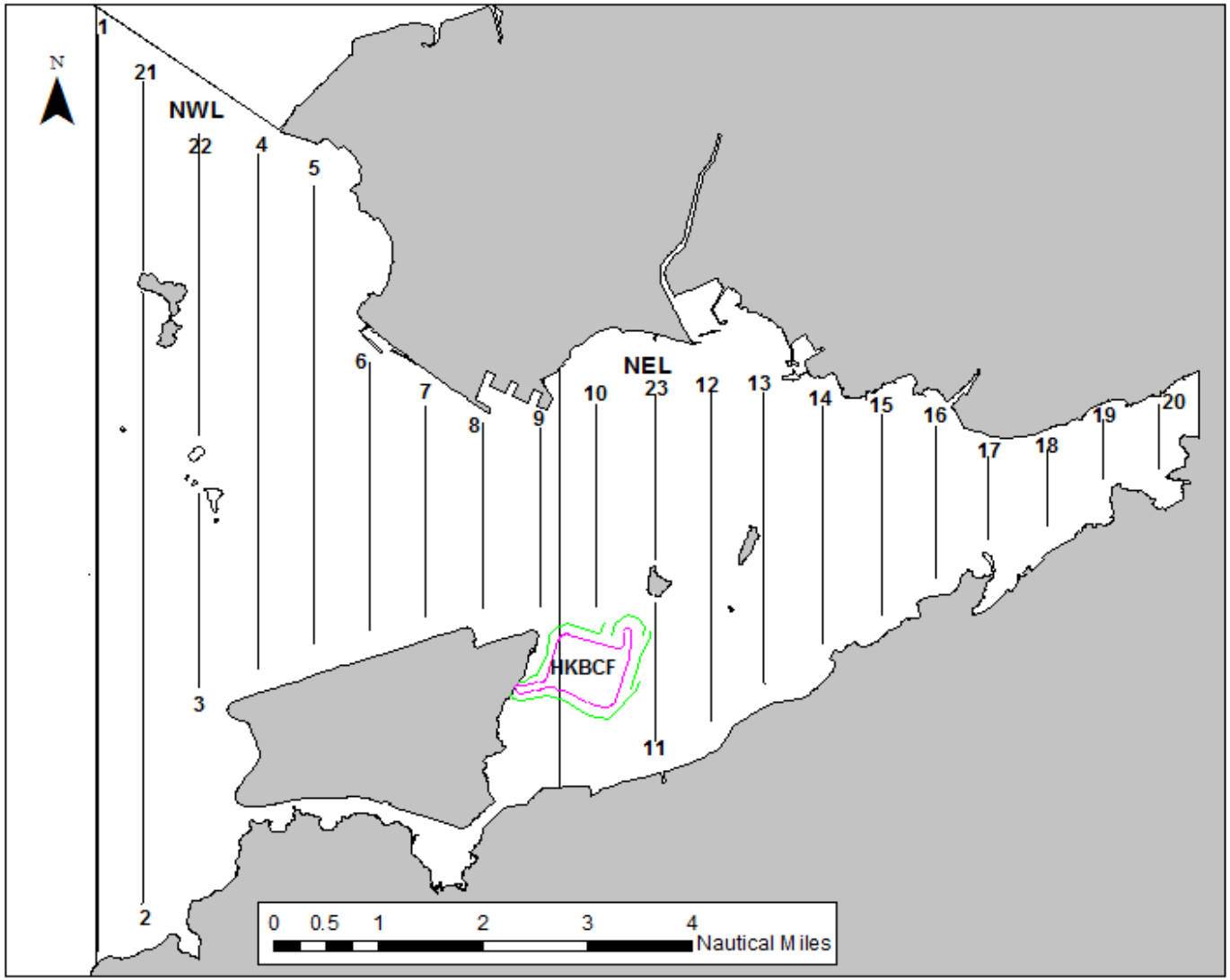

Figure 2 **Location of the Transect Lines for Baseline and Impact Monitoring during HKBCF (modified to accommodate HKBCF)**

2.3. Photo-identification

When a dolphin(s) is sighted, the vessel leaves the transect line and slowly approaches the group or individual. Attempts are made to photograph every individual sighted although close approaches to mother and calf pairs are not attempted. A digital SLR camera (Nikon D90) using long lenses (Nikor 80-200mm and fixed length 300mm) are used to obtain high resolution images. Effort is made to ensure consistency of image quality, e.g., no shadow and at an angle perpendicular to the dorsal fin. Polarising filters are used to minimise glare. In this manner, the best image clarity is achieved and image sorting and matching is more consistent. Images are sorted according to clarity and presence/absence of identifying features (nicks/cuts/deformities/injury/pigmentation). Only images deemed to be of suitable quality and as containing sufficient markings for unambiguous identification are included in the photo-identification catalogue.

2.4. Data Analyses

2.4.1. Distribution pattern analysis

Dolphin sightings data are mapped in the Geographic Information System (GIS) ArcView© 10.1.

2.4.2. Encounter rate analysis

For this report, the baseline encounter rates were re-calculated using the revised data provided (as presented in Annex I) rather than quoting directly from the baseline report. Calculation followed the EM&A Manuel methodology.

2.4.3. Quantitative grid analysis of habitat use

Quantitative grid analysis is performed by mapping both sighting and dolphin densities plotted onto 1kmx1km grid squares. Only “on effort” sightings made while on a transect line and under favourable conditions should be included in grid analyses. These densities are standardised by effort by calculating survey coverage in each line transect survey to determine the number of times the grid has been surveyed. Densities are calculated using the following formulae;

SPSE and DPSE:

$$SPSE = (S/E \times 100)/SA\%$$
$$DPSE = (D/E \times 100)/SA\%$$

Where;

S= total number “on effort” sightings
D = total number dolphins from “on effort” sightings
E = total number units survey effort
SA% = percentage of sea area

2.4.4. Behavioural analysis

When dolphins are sighted during vessel surveys, their behaviour is observed. Different activities are categorised (i.e. feeding, traveling, socialising, surface active, associated with boats, unknown) and recorded in the sighting data form of Logger. The sightings form is integrated with survey effort and positional data and can be subsequently mapped to examine distribution and behavioural trends. All sightings data (“on-effort” and “opportunistic”) are used in this analysis.

2.4.5. Ranging pattern analysis

Home ranges for individual dolphins can be calculated using a variety of software (Worton 1989). In the baseline monitoring report, the program Animal Movement Analyst Extension, created by the Alaska Biological Science Centre, USGS was used in conjunction with ArcView© 3.1 and Spatial Analyst 2.0. Using the fixed kernel method, kernel density estimates and kernel density plots are created using all sightings. In the baseline monitoring, data from other studies and from outside the baseline monitoring period were used to map individual ranges. It is important to maximize the number of sightings used as kernel analyses cannot be conducted unless more than 20 independent sightings are made for an individual although it is recommended that a minimum of 70 resightings are used before kernel analyses has any accuracy (Wauters *et al* 2007; Kauhala and Auttila 2010). AFCD Annual Reports use a minimum of 15 resightings for kernel analyses (AFCD 2012). To date, too few data on individual dolphins exist from impact monitoring alone, i.e., 15 or more independent resightings per individual, to map utilisation densities using the fixed kernel method. The most resightings for an individual dolphin in the impact monitoring period (15 months) is eight (HZMB 011)

3. RESULTS AND DISCUSSIONS

3.1. Summary of survey effort and dolphin sightings

From March-May 2013, 12 vessel surveys were conducted in NEL and NWL survey areas (Annex III). A total of 668.6km of "on-effort" transect lines were conducted, of which 638.9km were under favourable conditions. Therefore, 96% of vessel surveys were conducted under favorable conditions (Annex IV). Only those periods of "on-effort" survey conducted under favourable conditions were included in quantitative. During March-May 2013, 50 groups of dolphins, numbering 72 (min 65: max 79[4]) individuals, were sighted from the vessel surveys. Of these, 13 groups were "on-effort" and the remaining 9 "opportunistic" (Annex II).

Of the 22 sightings, all groups were located in NWL. The baseline report, conducted during September-November 2011, notes a total of 44 groups, 34 of which occurred in NWL and 10 in NEL. For period March-May 2012, a total of 20 groups were sighted, 19 of which were located in NWL and one in NEL. There are differences between the number of sightings made during baseline compared to the two spring periods of 2012 and 2013, however, there is known to be seasonal variation of dolphin occurrence in north Lantau, indeed within Hong Kong (AFCD 2012). When a comparison is made between March-May 2012 and the same period in 2013, the numbers of dolphin groups seen in each area is very similar (NWL; 22 vs. 19: NEL; 0 vs. 1). Maps depicting location of sightings which have not been corrected for effort or survey track length are included as Figs. 3;4;5;6.

Table 2. A Comparison of Total Sightings Recorded in NEL and NWL Areas Combined During Sep – Nov 2011, March-May 2012 and March-May 2013

Monitoring Period	Total Dolphin Sighting in NWL	Total Dolphin Sighting in NEL
	Number of Groups	Number of Groups
Sep – Nov 2012 (Baseline Monitoring)	34	10
March – May 2012 (Impact Monitoring)	19	1
March – May 2013 (Impact Monitoring)	22	0

[4] During sightings a minimum, maximum and best estimate of group size is noted; the range stated represents the minimum and maximum numbers estimated)

After exclusion of all sightings noted between transect lines, baseline monitoring has 44 sightings, March – May 2012 has 16 sightings and March – May 2013, 17 sightings were recorded. (Table 3). There are fewer sightings between the two spring seasons and the baseline period, however, spring 2012 and 2013 differ in absolute sightings numbers by only one. No correction for effort is made with these numbers, this is calculated in section 3.3.

Table 3. A Comparison of Sightings Recorded in NEL and NWL Combined During Sep – Nov 2011 and March-May 2012 and March-May 2013.

Monitoring Period	Groups of Dolphin sighted in NEL and NWL
Sep - Nov 2011 (Baseline Monitoring)	44
March – May 2012 (Impact Monitoring)	16
March – May 2013 (Impact Monitoring)	17

3.2. Distribution

In March-May 2013 and March-May 2012, all on-effort sightings occurred in NWL. For the baseline, three quarters of the sightings made were in NWL. The similarities between the two spring periods are clear, however, there is no correction for effort (Table 4; Figure 6). For all periods, areas of importance include the Shau Chau Lung Kwu Chau Marine Park (SCLKCMP) area and adjacent, eastern waters (Fig. 6). Both baseline and 2011 monitoring data indicate that SCLKCMP is frequented all year round by dolphins and is perceived to be critical habitat. The use of NEL is regarded as more seasonal.

Table 4. A Comparison of Sightings Recorded in NEL and NWL During Sep – Nov 2011, March-May 2012 and March-May 2013

Monitoring Period	No. of Dolphin Groups sighted in NWL	No. of Dolphin Groups sighted in NEL
Sep - Nov 2011 (Baseline Monitoring)**	34	10
March-May 2012 (Impact Monitoring)	16	0
March-May 2013 (Impact Monitoring)	17	0

3.3. Encounter rate

As the survey periods have different transect lengths, variation in sightings occurrence was quantified by correcting for the different amount of effort (number and distance of transect lines surveyed, i.e., km spent "on-effort"), to obtain an encounter rate. The baseline study (Sep-Nov 2011) reports that a total of 545.6km[5] of survey effort was conducted under favourable conditions in the NEL and NWL survey areas compared to 368.4km and 638.9 km conducted during March-May 2012 and 2013, respectively. The reported NEL encounter rate for Sep-Nov 2011 is 5.4 and for both March-May 2012 and 2013 is 0. For the same periods for NWL, the encounter rates is 9.5 (calculated), 5.7 and 3.1 respectively (Table 5). The baseline encounter rates for NWL and NEL are both higher than that recorded for March-May 2012 and 2013 periods. The low encounter rate for NEL is common to both 2012 and 2013 March-May periods.

Table 5. A Comparison of Encounter Rates* in NEL and NWL Areas for Mar-May 2012, Sep – Nov 2011 and Mar-May 2013.

Monitoring Period	Encounter Rate NEL	Encounter Rate NWL (*)
Sept-Nov 2011 (Baseline Monitoring)	5.4	9.5
Mar 2012 - May 2012 (Impact Monitoring)	0.0	5.7
Mar 2013 - May 2013 (Impact Monitoring)	0.0	3.1

The AFCD Annual Reports describe variation in spatial distribution between areas and between seasons in NEL and NWL. For the last sixteen years, it is reported that overall **annual encounter rate** for NEL varies between 1.6 and 6.2 and the **annual encounter rate** for NWL varies between 5.8 and 17.0. There have been both up and down movements within these limits, however, the general trend in yearly encounter rate for dolphins in all areas of Hong Kong is reported to be declining significantly (AFCD 2013). For the months September-November, graphic representation in the Baseline Report trend graph indicates that, for NEL, encounter rates vary between ~1 and ~5 and, for NWL, encounter rates vary between ~5 and ~11 (Figure 4b, Baseline Report, 2007-11 inclusive). There are considerable differences between these encounter rates which makes detecting any significant or unusual change problematic. AFCD reports do not depict variation or error on graphs presented and concomitantly it is also difficult to understand where significant bounds may lie for these rates.

The NWL encounter rate recorded during baseline Sept-Nov 2011 is higher than the two spring periods 2012 and 2013 (March-April) and seasonal variation of habitat use is noted. For NEL, both 2012 and 2013 spring periods are the same at no on-effort encounters. With a reported decline in the area in the last decade (AFCD 2013) it is challenging to understand how any impact from HKBCF can be discerned against the lowering usage of NEL reported in the last decade (AFCD 2013)

[5] Updated data set provided April 2013

3.4. Group size

During impact monitoring, group size of all sightings varied from 1 to 12 individuals with an overall average of 3.3. For baseline monitoring, the NWL average group size was 4.5 and in March-May 2012 the average group size was 3.2. For baseline monitoring, the NEL average group size was 3.2 and during March-May 2012 it was 1. (Table 6). A map depicting group size distribution shows that larger groups occur at SCLKCMP and are associated with groups containing calves (Fig. 7).

Table 6. A Comparison of Sightings Group Size Averages Recorded in NEL and NWL Areas During Sep – Nov 2011, March-May 2012 and March-May 2013

Monitoring Period	Average Group Size (NWL)	Average Group Size (NEL)
Sep - Nov 2011 (Baseline Monitoring)	4.5	3.5
March-May 2012 (Impact Monitoring)	3.2	1
March-May 2013 (Impact Monitoring)	3.3	0

As encounter rate and group size are both subject to variation, the use of other more powerful analyses may be more appropriate to discern differences over the shorter term, such as multi-variate analyses (Taylor *et al* 2007). This is important so that project impact can be monitored over relevant time scales. Alternative analyses have been developed and are currently being processed to determine if additional statistical tools allow for a more detailed data interpretation for the shorter time periods considered during impact monitoring. This was reported in the last quarterly report and the proposed analyses are underway.

3.5. Habitat use

Quantitative grid analyses indicates that the most often frequented areas in NWL were the SCLKCMP. Density in this area has decreased since the last quarter report period. For NEL no encounters were made while on effort (Figs. 8; 9). The grid analyses from this quarter shows a similar distribution in NWL to that published in the AFCD long term monitoring reports and the baseline monitoring report. These areas of high use have been consistent in the long term and continue to be so.

3.6. Mother-calf pairs

Eight of the groups sighted contained mother and calf pairs. All groups were sighted at SCLCKMP (Fig. 10). Calves comprised 10.5% of all dolphins sighted, higher than that reported in the last quarterly report (5.6%) and that reported for the baseline monitoring period (6.8%).

3.7. Activities

Of the 22 groups sighted (using all sightings), six (27%) were engaged in feeding activities; eight groups were travelling (36%); six groups were feeding/travelling/socialising (27%). One group was resting at the surface, noted as “other” (5%). The activity of one group was unknown (5%). Feeding was the predominant activity during daylight hours in March and April and, in May, the most commonly noted behavior was travelling with an increase in socialising activities in April and May (Fig. 11). In NWL, feeding occurred most often at east SCLKCMP and the northern edge of the airport platform remains an important feeding area (Fig. 12).

3.8. Photo-identification work

The photo-identification catalogue was regularly updated and re-sightings of dolphins previously identified were recorded. The project specific photo-identification catalogue for the impact monitoring period is presented in Annex V. There are now a total of 94 individually identified dolphins which have been identified in the stand alone catalogue prepared for HKBCF (one of which is deceased and not included in Annex V). Not all dolphins sighted have sufficient scarring, injury or pigmentation uniqueness to be unambiguously identified; to date an estimated 64% of the dolphins sighted have clear and identifying characteristics. During the baseline survey, 96 individuals were noted in the NEL, NWL and WL areas. Of these, 57 were noted in the NEL and NWL area. To date, 17 individuals seen during baseline in NEL and NWL have been re-sighted (one of which is now deceased) and 40 have not. The most number of re-sightings is of HZMB 051 seen now seven times. Seen six times are HZMB 074 and HZMB 073, who have been consistently sighted in the same group, and HZMB 011 and HZMB 044. Even when pooled with baseline data, the highest number of re-sightings is eight and this does not consider independence of sightings, a critical assumption in kernel analyses (Annex V; Table1).

4. CONCLUSION

The data from March-May 2013 shows many consistencies with the results reported in the same period 2012 but differs from the baseline which was conducted during a different season. Habitat use, encounter rates, group size and behavioural trends all fall within those reported in AFCD Long Term Monitoring reports including low usage of NEL on a seasonal basis. The existing long term data set does show an inherent variation in all patterns and rates as well as an apparent decrease in abundance estimates observed across the areas NEL and NWL (AFCD 2013). Density distribution maps depicted key areas of frequent use within NWL, in particular, SCLKMP. Behavioural patterns were broadly similar, with an increase in socialising behavior in April and May but a marked decrease in feeding behavior in these months. It is noted that the Hong Kong trawl ban commenced on 31 December 2012 and that dolphins have been sighted across the western maritime border following active fishing trawlers in March and April. This is not part of the impact monitoring designated area, however, it is known that dolphins freely travel across this area and dolphins which “normally” reside in Hong Kong may be spending more than usual amounts of time in adjacent waters feeding behind trawlers. It is also noted that preparation works for other, non HKBCF Projects started in January 2013 and have continued throughout March-May 2013. As such, there is increased boat traffic and underwater works in the southern sector of NWL which may cause disturbance to dolphins.

It is anticipated that the multi-parameter analytical approach currently underway will provide an integrated analysis which will assist in interpreting the different variables which potentially drive dolphin populations within Hong Kong waters.

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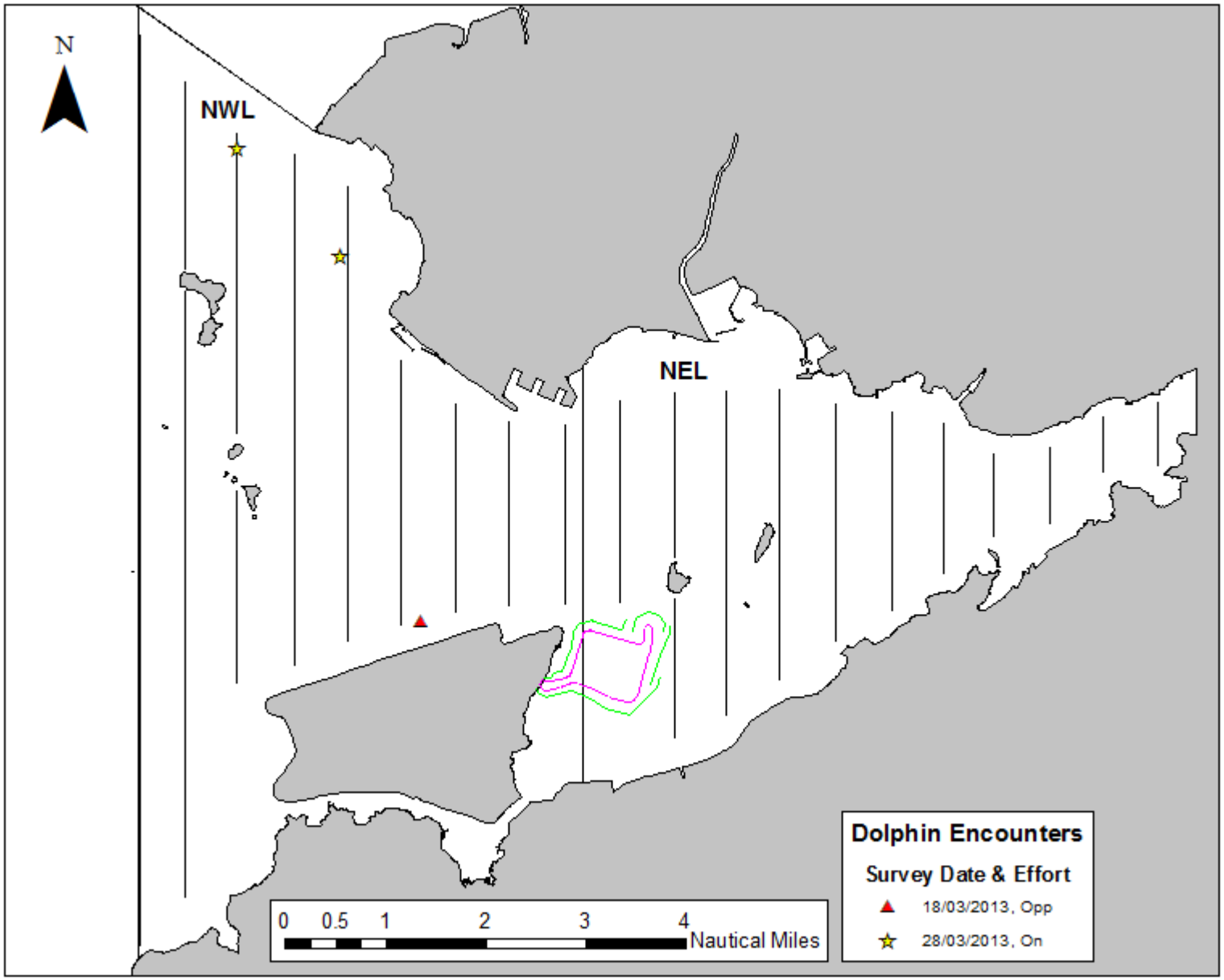


Figure 3 Distribution of Sightings Recorded During Impact Monitoring Surveys for HKBCF (March 2013)

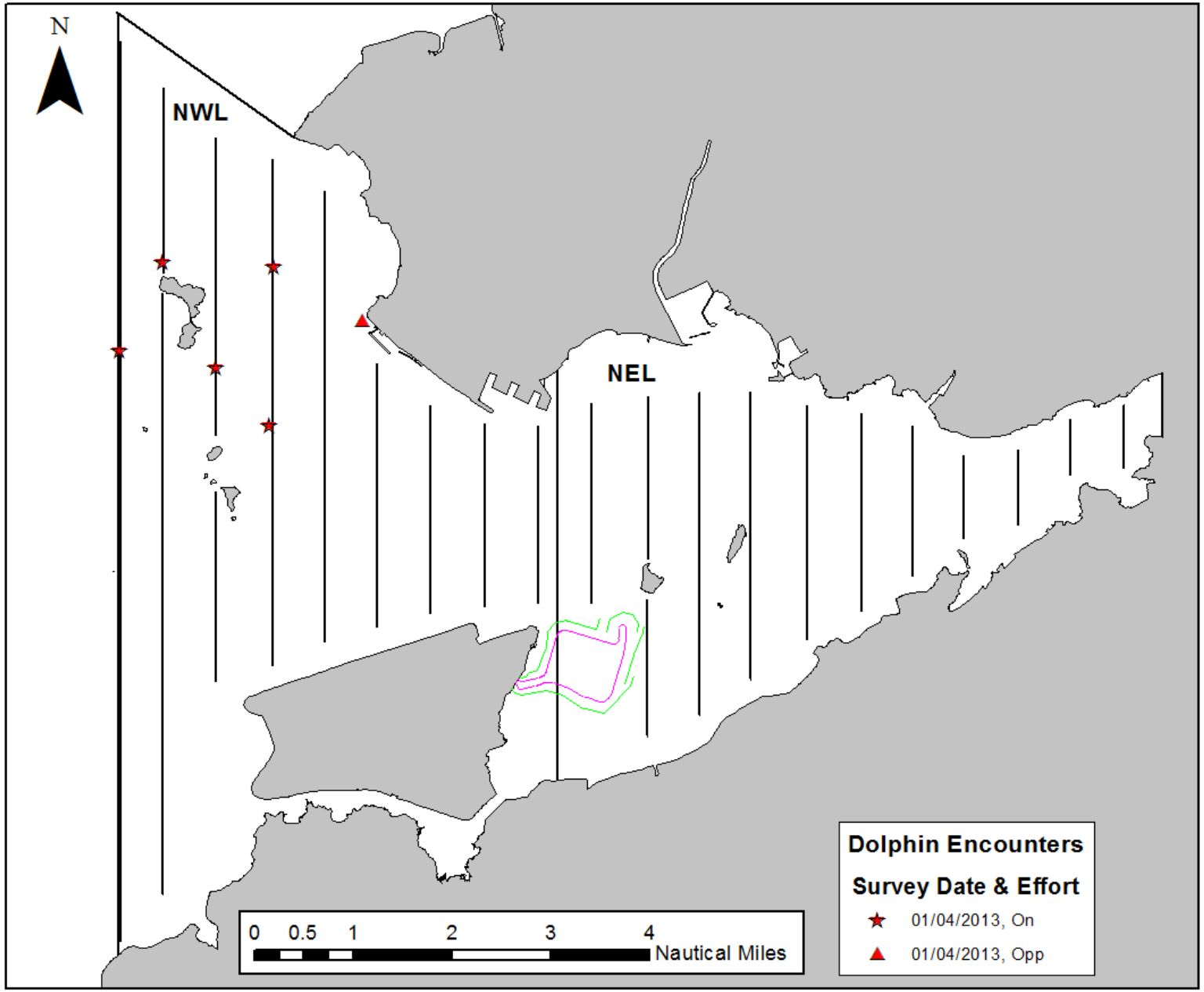


Figure 4 Distribution of Sightings Recorded During Impact Monitoring Surveys for HKBCF (April 2013)

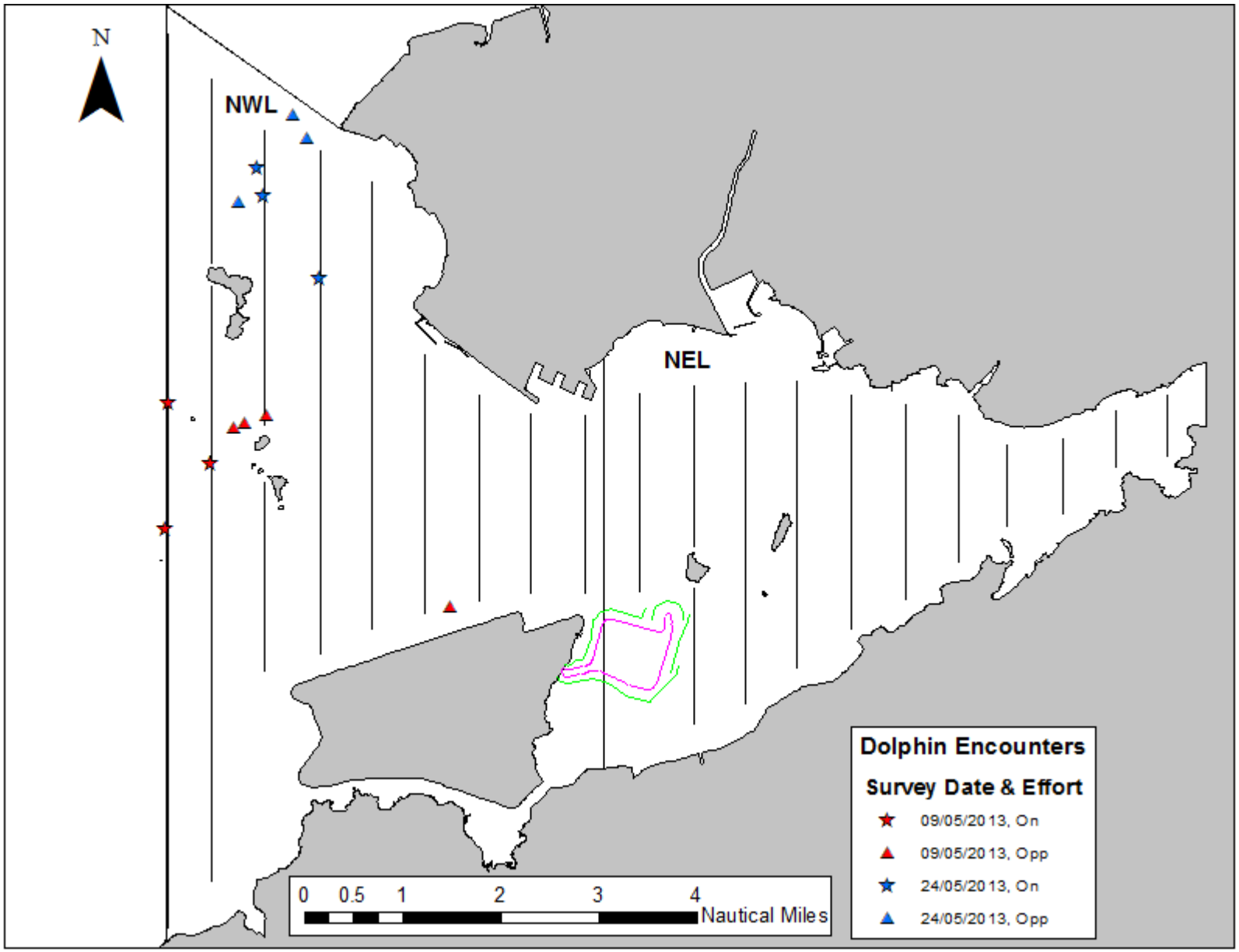


Figure 5 Distribution of Sightings Recorded During Impact Monitoring Surveys for HKBCF (May 2013)

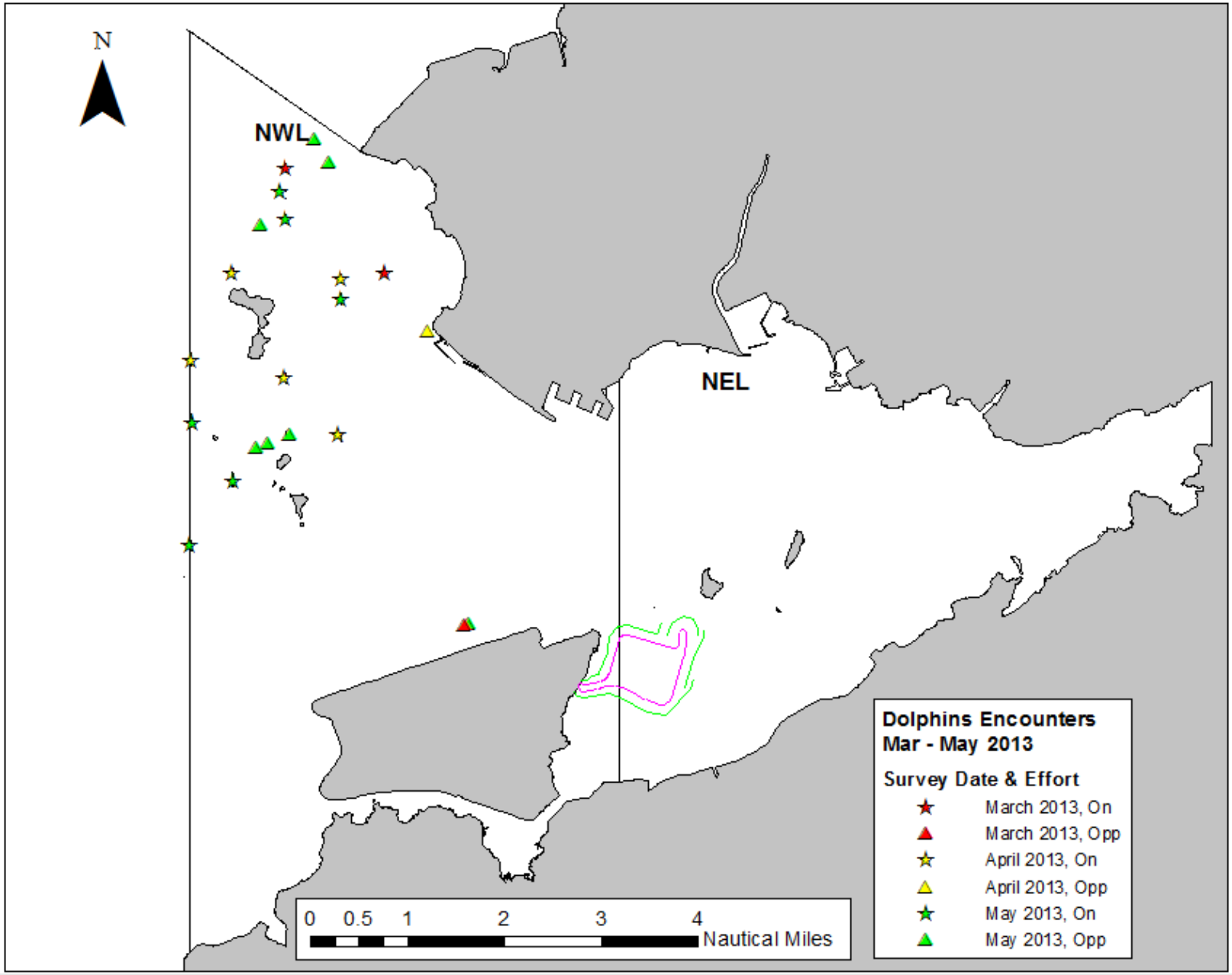


Figure 6. Distribution of Sightings Recorded During Impact Monitoring Surveys for HKBCF (March-May 2013)

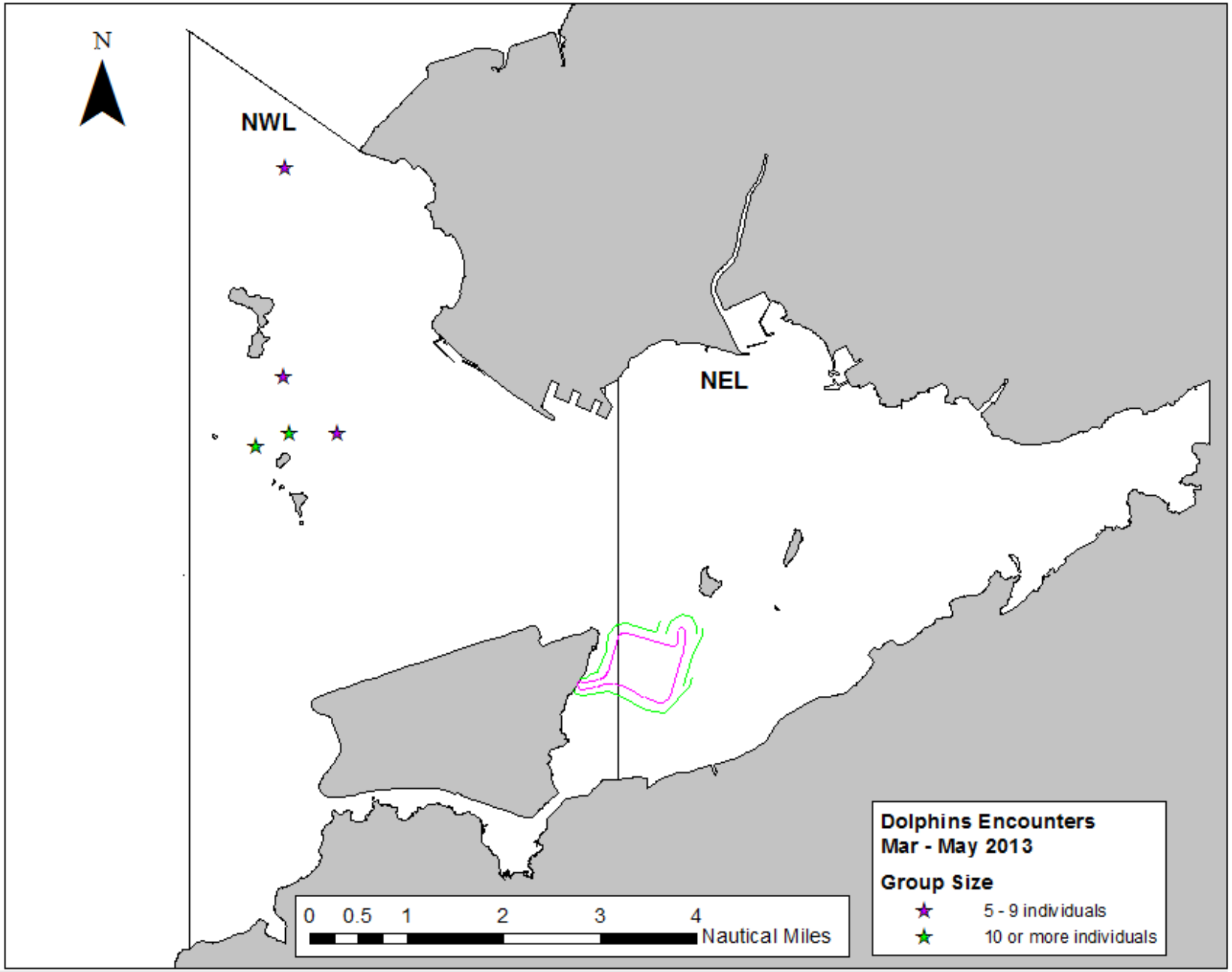


Figure 7. The Location of Dolphin Groups Numbering 5 and Above Individuals (March-May 2013)

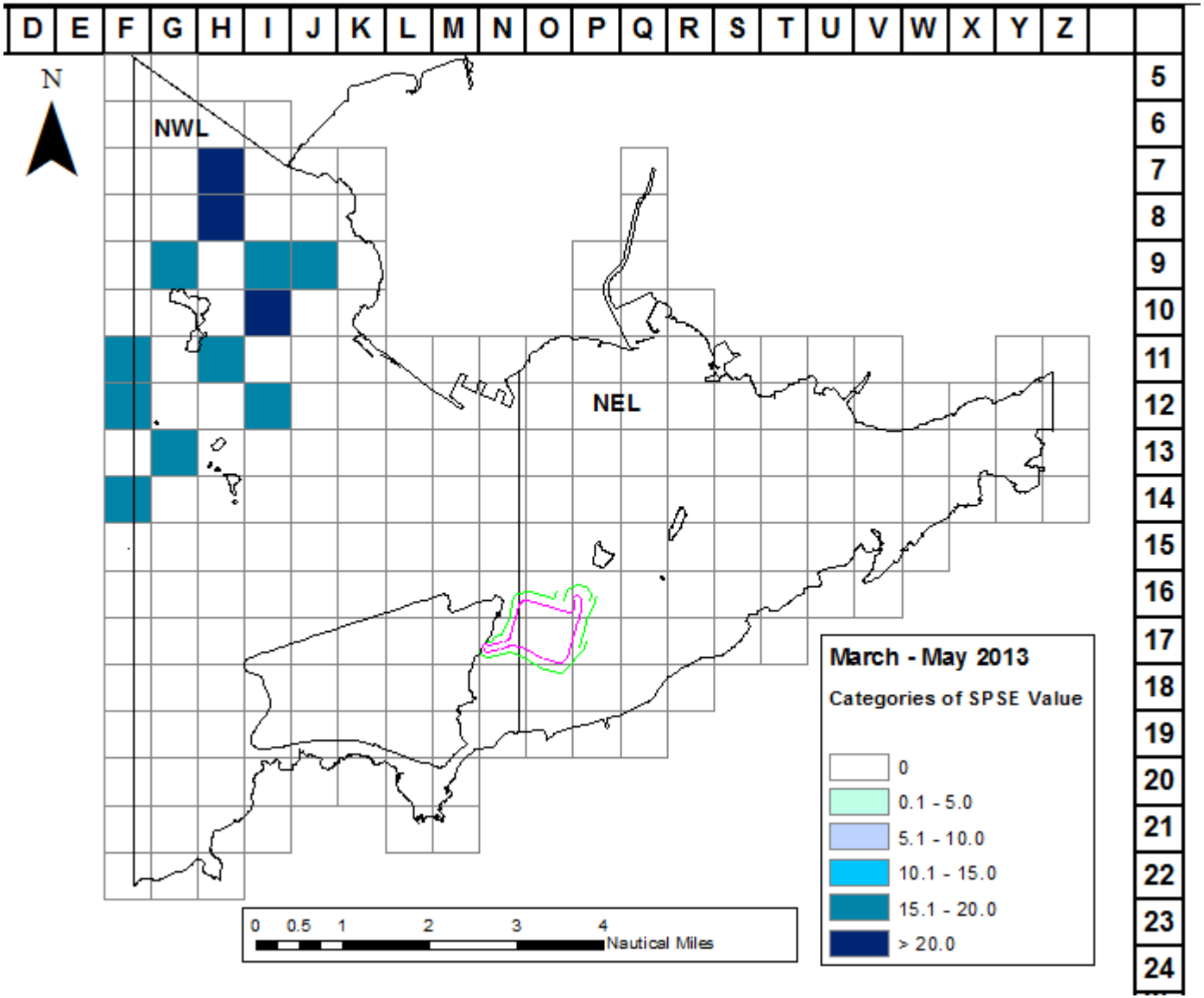


Figure 8. Sighting density SPSE (number of on-effort sightings per 100 units of survey effort) for March-May 2013.

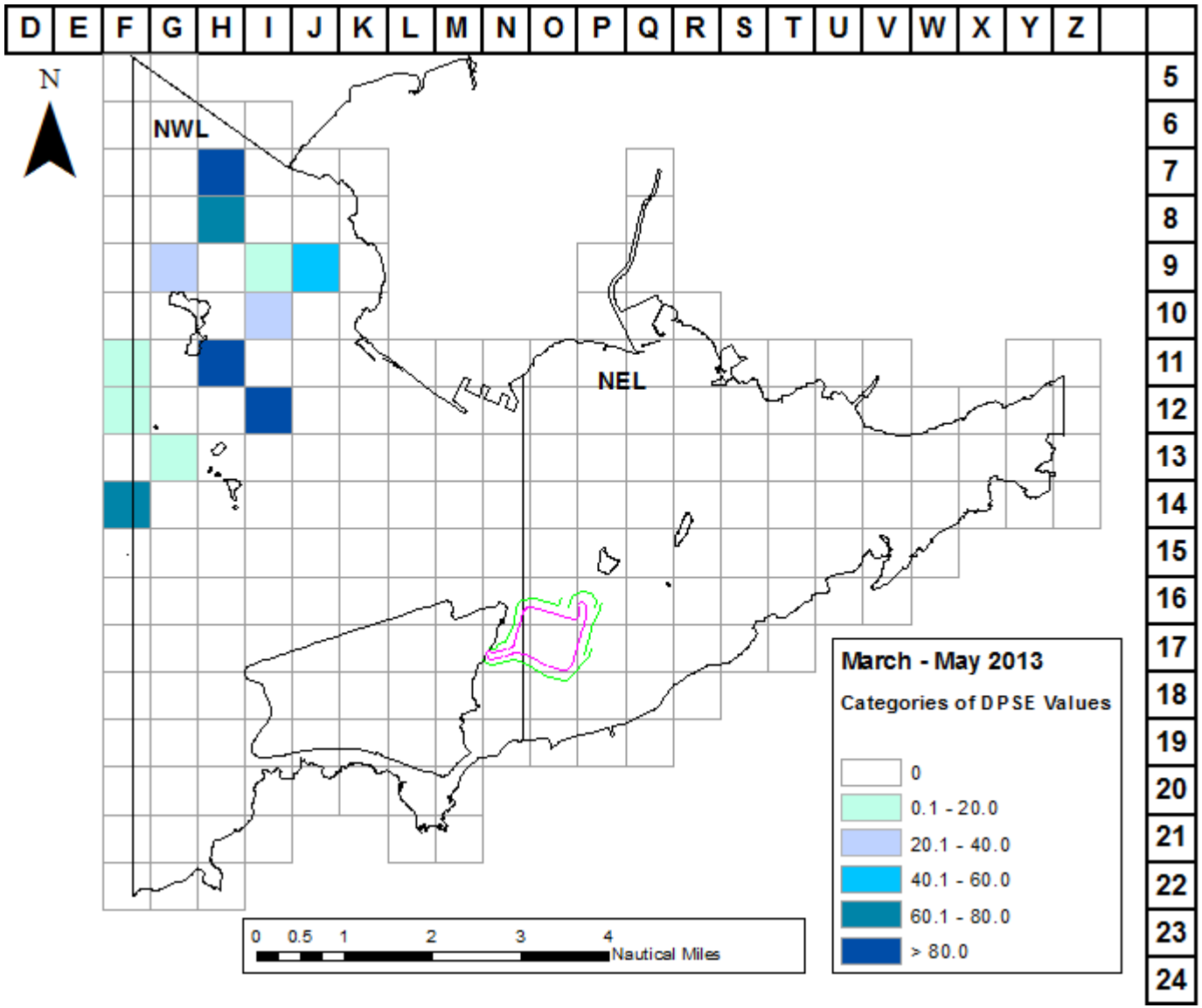


Figure 9. Dolphin density DPSE (number of dolphins per 100 units of survey effort) for March-May 2013.

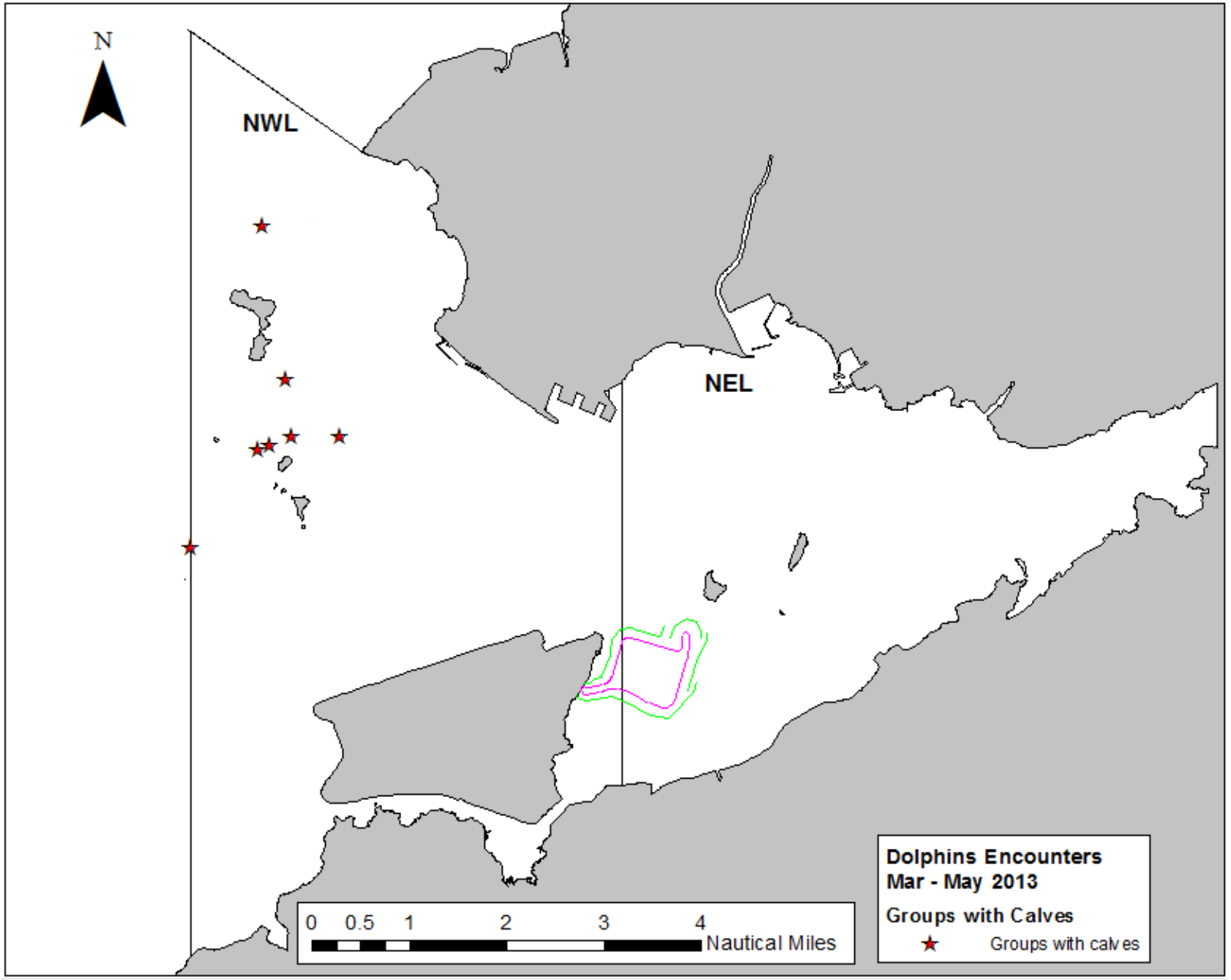


Figure 10. Location of groups containing mother and calf pairs during March-May 2013.

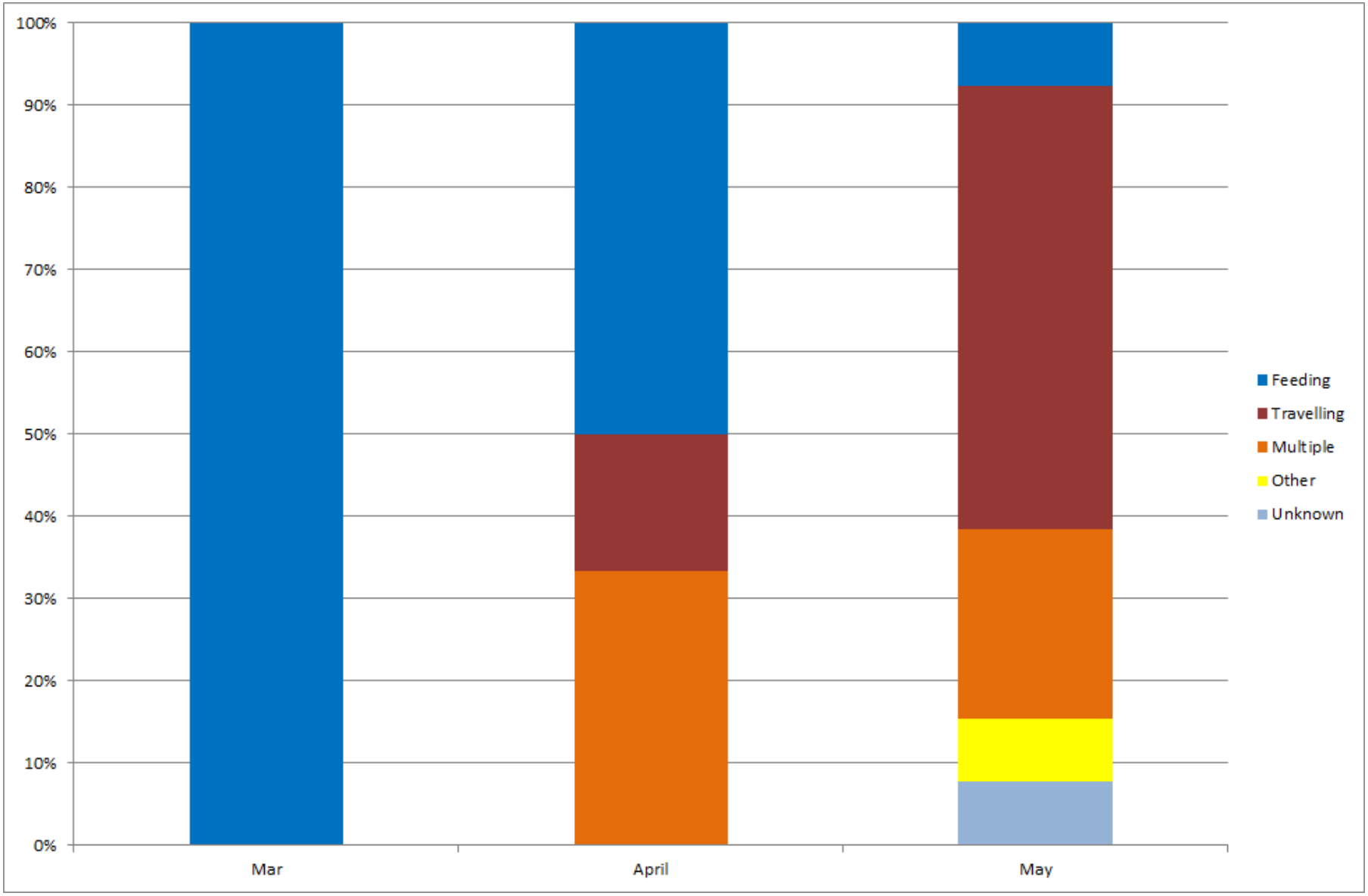


Figure 11. Activity Budget for Dolphin Behaviour March-May 2013.

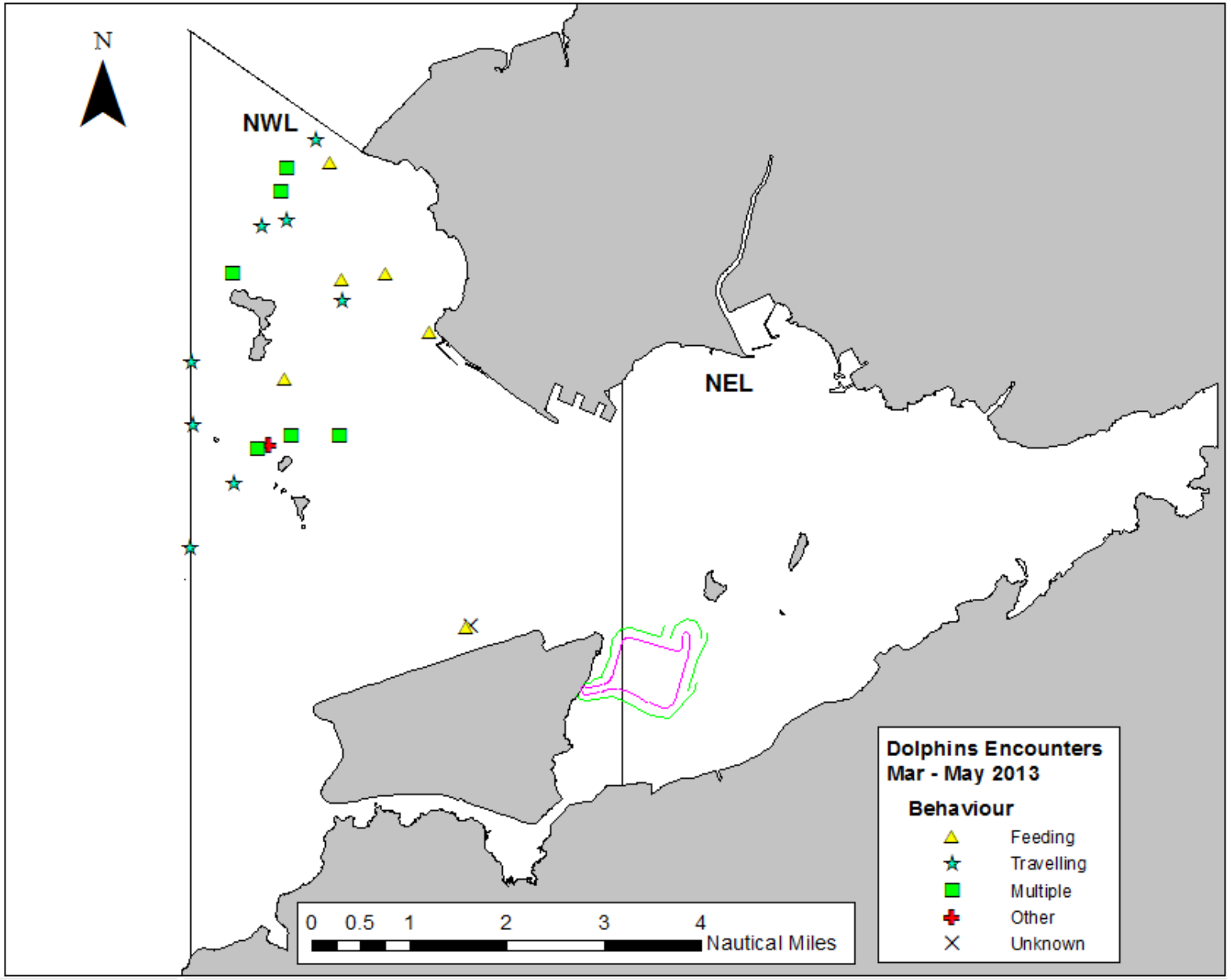


Figure 12. The Location of Different Behavioural Activities March-May 2103

Annex I Excerpt from the HYD-HZMB Edited 2011 / Baseline data (provided January 2013):

Baseline September – November 2011 Sightings and Trackline

AREA	DATE	TIME	HRD SZ	BEAU	PSD
NE LANTAU	7-Sep-11	1657	1	2	179
NE LANTAU	6-Oct-11	1306	5	2	57
NE LANTAU	10-Oct-11	1629	3	2	167
NE LANTAU	13-Oct-11	1459	2	2	42
NE LANTAU	1-Nov-11	1405	4	2	350
NE LANTAU	1-Nov-11	1505	8	2	277
NE LANTAU	1-Nov-11	1612	4	2	159
NE LANTAU	5-Nov-11	1516	4	1	195
NE LANTAU	5-Nov-11	1537	2	1	136
NE LANTAU	5-Nov-11	1614	2	2	193

Area	Groups	Individuals	Trackline (KM)	Encounter rate
All	44	188		
NEL	10	35	175.7	5.7
NWL	34	153	359.0	9.5

AREA	DATE	TIME	HRD SZ	BEAU	PSD
NW LANTAU	7-Sep-11	1055	2	2	349
NW LANTAU	16-Sep-11	1013	2	2	330
NW LANTAU	16-Sep-11	1038	4	2	87
NW LANTAU	16-Sep-11	1102	2	1	59
NW LANTAU	16-Sep-11	1144	3	2	157
NW LANTAU	16-Sep-11	1204	1	2	4
NW LANTAU	16-Sep-11	1210	9	2	73
NW LANTAU	16-Sep-11	1406	3	2	295
NW LANTAU	23-Sep-11	1517	4	3	26
NW LANTAU	23-Sep-11	1538	2	3	137
NW LANTAU	6-Oct-11	1455	2	1	236
NW LANTAU	10-Oct-11	1009	3	3	183
NW LANTAU	10-Oct-11	1207	9	3	382
NW LANTAU	17-Oct-11	1548	1	2	583
NW LANTAU	28-Oct-11	953	1	2	662
NW LANTAU	28-Oct-11	1044	8	3	0
NW LANTAU	28-Oct-11	1117	7	3	160
NW LANTAU	28-Oct-11	1129	4	3	93
NW LANTAU	1-Nov-11	1021	4	2	161
NW LANTAU	1-Nov-11	1135	2	1	524
NW LANTAU	1-Nov-11	1156	5	2	161
NW LANTAU	2-Nov-11	1501	2	2	30
NW LANTAU	2-Nov-11	1513	18	2	282
NW LANTAU	2-Nov-11	1555	3	2	262
NW LANTAU	2-Nov-11	1601	12	2	263
NW LANTAU	5-Nov-11	1018	1	2	204
NW LANTAU	5-Nov-11	1025	4	2	220
NW LANTAU	5-Nov-11	1110	2	2	220
NW LANTAU	5-Nov-11	1121	1	2	534
NW LANTAU	5-Nov-11	1153	7	1	248
NW LANTAU	5-Nov-11	1208	5	1	21
NW LANTAU	5-Nov-11	1321	8	2	312
NW LANTAU	7-Nov-11	1116	8	2	790
NW LANTAU	7-Nov-11	1136	4	2	59

Annex I (con) Excerpt from the HYD-HZMB Edited 2011 / Baseline data (provided January 2013): December 2011- February 2012 Sightings and Trackline

AREA	DATE	STG #	TIME	HRD SZ	BEAU	PSD
NE LANTAU	12-Dec-11	1	1203	8	2	538
NE LANTAU	12-Dec-11	2	1230	1	2	817
NE LANTAU	17-Jan-11	4	1236	4	3	707
NW LANTAU	12-Dec-11	3	1431	2	3	88
NW LANTAU	12-Dec-11	4	1435	1	3	147
NW LANTAU	14-Dec-11	4	1612	3	3	186
NW LANTAU	30-Jan-12	1	1025	1	2	360
NW LANTAU	30-Jan-12	2	1114	3	3	172
NW LANTAU	30-Jan-12	3	1208	2	3	59

Area	Groups	Individuals	Trackline (KM)	Encounter rate
All	9	25		
NEL	3	13	65.9	4.6
NWL	6	12	97.8	6.1

Annex II. Impact Monitoring Sighting Database (March – May 2013)

Project	Contract	Date	Sighting	Time	Group Size	Area	Beaufort	PSD*	Effort	Type	Latitude	Longitude	Season	Boat Assoc
HKBCF	HY/2012/02	18/03/2013	601	14:06:35	2	NWL	1	N/A	Opp	Impact	22.32401	113.9208	SPRING	No
HKBCF	HY/2012/02	28/03/2013	607	09:21:11	5	NWL	2	658	On	Impact	22.40307	113.8874	SPRING	No
HKBCF	HY/2012/02	28/03/2013	608	11:08:03	3	NWL	2	69	On	Impact	22.38494	113.9060	SPRING	No
HKBCF	HY/2012/02	01/04/2013	617	09:31:58	1	NWL	2	18	On	Impact	22.36983	113.8699	SPRING	No
HKBCF	HY/2012/02	01/04/2013	619	10:25:29	2	NWL	1	210	On	Impact	22.38482	113.8776	SPRING	No
HKBCF	HY/2012/02	01/04/2013	621	12:28:50	8	NWL	2	70	On	Impact	22.36683	113.8874	SPRING	No
HKBCF	HY/2012/02	01/04/2013	622	13:42:59	1	NWL	1	13	On	Impact	22.38394	113.8979	SPRING	No
HKBCF	HY/2012/02	01/04/2013	623	14:16:52	6	NWL	2	36	On	Impact	22.35708	113.8972	SPRING	No
HKBCF	HY/2012/02	01/04/2013	625	16:01:32	1	NWL	1	N/A	Opp	Impact	22.37480	113.9140	SPRING	No
HKBCF	HY/2012/02	09/05/2013	642	09:39:45	4	NWL	1	88	On	Impact	22.33774	113.8698	SPRING	No
HKBCF	HY/2012/02	09/05/2013	644	10:06:08	1	NWL	1	111	On	Impact	22.35900	113.8702	SPRING	No
HKBCF	HY/2012/02	09/05/2013	646	11:39:47	1	NWL	1	154	On	Impact	22.34885	113.8779	SPRING	No
HKBCF	HY/2012/02	09/05/2013	647	12:26:41	12	NWL	1	NA	Opp	Impact	22.35706	113.8883	SPRING	No
HKBCF	HY/2012/02	09/05/2013	648	12:26:30	3	NWL	1	NA	Opp	Impact	22.35561	113.8843	SPRING	No
HKBCF	HY/2012/02	09/05/2013	649	12:29:29	12	NWL	1	NA	Opp	Impact	22.35479	113.8822	SPRING	No
HKBCF	HY/2012/02	09/05/2013	650	16:24:48	1	NWL	2	NA	Opp	Impact	22.32444	113.9218	SPRING	No
HKBCF	HY/2012/02	24/05/2013	655	12:39:05	1	NWL	1	53	On	Impact	22.39432	113.8874	SPRING	No
HKBCF	HY/2012/02	24/05/2013	656	13:01:37	1	NWL	1	NA	Opp	Impact	22.39327	113.8829	SPRING	No
HKBCF	HY/2012/02	24/05/2013	657	13:08:11	3	NWL	1	669	On	Impact	22.39903	113.8865	SPRING	No
HKBCF	HY/2012/02	24/05/2013	659	14:01:54	2	NWL	1	NA	Opp	Impact	22.40817	113.8930	SPRING	No
HKBCF	HY/2012/02	24/05/2013	660	14:03:36	1	NWL	1	NA	Opp	Impact	22.40400	113.8956	SPRING	No
HKBCF	HY/2012/02	24/05/2013	661	14:12:02	1	NWL	1	99	On	Impact	22.38037	113.8977	SPRING	No

***** Perpendicular Sighting Distance

Annex III. Impact Monitoring Survey Schedule and Details (March – May 2013)

Date	Location of Survey	No. Sightings ON	No. Sightings Opp	Total km ON EFFORT (favourable conditions)
18-03-13	NW and NE Lantau	0	1	77.8
19-03-13	NE Lantau	0	0	33.5
27-03-13	NW Lantau	0	0	35.2
28-03-13	NW and NE Lantau	2	0	76.1
01-04-13	NW Lantau	5	1	63.9
02-04-13	NW and NE Lantau	0	0	48.1
22-04-13	NW Lantau	0	0	70.4
23-04-13	NW and NE Lantau	0	0	40.5
09-05-13	NW Lantau	3	4	64.6
10-05-13	NW and NE Lantau	0	0	47.2
24-05-13	NW Lantau	3	3	63.4
27-05-13	NW and NE Lantau	0	0	47.9

Annex IV. Impact Monitoring Survey Effort Summary (March – May 2013)

Date	Area	Sea State (on effort)	Effort (km)	Season	Vessel	Type
18-03-13	NWL	1	74	SPRING	HKDW	IMPACT
18-03-13	NEL	1	3.8	SPRING	HKDW	IMPACT
19-03-13	NEL	1	29.9	SPRING	HKDW	IMPACT
19-03-13	NEL	2	3.6	SPRING	HKDW	IMPACT
27-03-13	NWL	1	6.8	SPRING	HKDW	IMPACT
27-03-13	NWL	2	28.4	SPRING	HKDW	IMPACT
28-03-13	NWL	1	6.8	SPRING	HKDW	IMPACT
28-03-13	NWL	2	11.5	SPRING	HKDW	IMPACT
28-03-13	NWL	3	9.2	SPRING	HKDW	IMPACT
28-03-13	NWL	4	11.8	SPRING	HKDW	IMPACT
28-03-13	NEL	1	30.2	SPRING	HKDW	IMPACT
28-03-13	NEL	2	6.6	SPRING	HKDW	IMPACT
01-04-13	NWL	1	31.7	SPRING	HKDW	IMPACT
01-04-13	NWL	2	25.8	SPRING	HKDW	IMPACT
01-04-13	NWL	3	6.4	SPRING	HKDW	IMPACT
02-04-13	NWL	1	10.6	SPRING	HKDW	IMPACT
02-04-13	NEL	0	4.0	SPRING	HKDW	IMPACT
02-04-13	NEL	1	30.2	SPRING	HKDW	IMPACT
02-04-13	NEL	2	3.3	SPRING	HKDW	IMPACT
22-04-13	NWL	1	0.8	SPRING	HKDW	IMPACT
22-04-13	NWL	2	19.9	SPRING	HKDW	IMPACT
22-04-13	NWL	3	32.1	SPRING	HKDW	IMPACT
22-04-13	NWL	4	17.6	SPRING	HKDW	IMPACT
23-04-13	NWL	1	3.5	SPRING	HKDW	IMPACT
23-04-13	NEL	1	36.6	SPRING	HKDW	IMPACT
23-04-13	NEL	2	0.4	SPRING	HKDW	IMPACT
09-05-13	NWL	1	59.5	SPRING	HKDW	IMPACT
09-05-13	NWL	2	5.1	SPRING	HKDW	IMPACT
10-05-13	NWL	1	10.2	SPRING	HKDW	IMPACT
10-05-13	NEL	0	4.1	SPRING	HKDW	IMPACT
10-05-13	NEL	1	31.1	SPRING	HKDW	IMPACT
10-05-13	NEL	2	1.8	SPRING	HKDW	IMPACT
24-05-13	NWL	0	15.8	SPRING	HKDW	IMPACT
24-05-13	NWL	1	42.7	SPRING	HKDW	IMPACT
24-05-13	NWL	2	0.6	SPRING	HKDW	IMPACT
24-05-13	NWL	3	4.3	SPRING	HKDW	IMPACT
27-05-13	NWL	2	3.2	SPRING	HKDW	IMPACT
27-05-13	NWL	3	6.8	SPRING	HKDW	IMPACT
27-05-13	NWL	4	0.3	SPRING	HKDW	IMPACT
27-05-13	NEL	1	32.1	SPRING	HKDW	IMPACT
27-05-13	NEL	2	3.7	SPRING	HKDW	IMPACT
27-05-13	NEL	3	1.8	SPRING	HKDW	IMPACT

Annex V. Photo ID Images (March 2012 – May 2013)

Table 1. Sightings of Individually Identified Chinese White Dolphin (*Sousa chinensis*) between March 2012 – May2013 and Baseline sightings

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
HZMB 098	NL104	2013-05-24	659	NWL
HZMB 097		2013-05-09	647	NWL
HZMB 096		2013-04-01	621	NWL
HZMB 095		2013-04-01	621	NWL
HZMB 094		2013-03-18	601	NWL
HZMB 093		2013-05-24	657	NWL
		2013-02-21	587	NWL
HZMB 092		2013-02-21	589	NWL
		2013-02-15	581	NWL
HZMB 091		2013-02-15	579	NWL
HZMB 090		2013-02-15	579	NWL
HZMB 089		2013-02-15	579	NWL
HZMB 088		2013-02-15	579	NWL
HZMB 087		2013-02-15	579	NWL
HZMB 086	NL242	2013-05-09	642	NWL
		2013-02-15	579	NWL
		2011-10-10	Baseline	NWL
HZMB 085		2013-02-15	579	NWL
HZMB 084		2013-02-14	575	NWL
HZMB 083	NL136	2013-03-28	607	NWL
		2013-02-15	579	NWL
		2013-01-28	568	NWL
		2012-01-28	564	NWL
HZMB 082		2013-02-21	587	NWL
		2013-02-15	579	NWL
		2013-01-28	563	NWL
HZMB 081		2013-01-28	559	NWL
		2013-01-28	557	NWL
HZMB 080		2013-01-28	556	NWL
HZMB 079		2013-01-28	556	NWL
HZMB 078		2013-02-15	579	NWL
		2013-01-08	552	NWL
HZMB 077		2012-12-11	541	NWL
HZMB 076		2012-12-11	541	NWL
HZMB 075		2012-12-06	525	NEL
HZMB 074		2013-05-09	647	NWL
		2013-04-01	623	NWL
		2013-04-01	621	NWL
		2013-02-21	594	NEL
		2012-12-10	529	NEL
		2012-12-06	525	NEL
HZMB 073		2013-05-09	647	NWL
		2013-04-01	623	NWL
		2013-04-01	621	NWL
		2013-02-21	594	NEL
		2012-12-10	529	NEL
		2012-12-06	525	NEL
HZMB 072		2012-10-24	476	NWL

Table 1. (con) Sightings of Individually Identified Chinese White Dolphin (*Sousa chinensis*) between March 2012 – May 2013 and Baseline sightings

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
HZMB 071		2012-10-24	475	NWL
		2012-10-12	466	NWL
HZMB 070		2012-10-24	476	NWL
HZMB 069		2012-10-24	476	NWL
HZMB 068		2012-10-24	476	NWL
HZMB 067		2012-10-24	475	NWL
HZMB 066	NL93	2013-01-28	559	NWL
		2012-12-11	537	NWL
		2012-10-24	475	NWL
		2012-10-12	466	NWL
HZMB 065		2012-10-12	466	NWL
HZMB 064		2013-05-09	647	NWL
		2013-01-28	561	NWL
		2012-10-24	475	NWL
		2012-10-12	466	NWL
HZMB 063		2013-05-09	647	NWL
		2012-10-12	466	NWL
HZMB 062		2012-12-06	525	NEL
		2012-10-11	457	NWL
HZMB 061		2012-09-18	448	NWL
HZMB 060		2012-09-18	447	NWL
HZMB 059		2013-02-21	591	NWL
		2012-09-18	445	NWL
HZMB 057		2012-09-18	440	NWL
HZMB 056		2012-09-18	442	NWL
		2012-09-05	433	NEL
HZMB 055		2012-09-04	425	NWL
HZMB 054	CH34	2012-09-05	432	NEL
		2011-11-07	Baseline	NWL
		2011-11-05	Baseline	NWL
		2011-11-02	Baseline	NWL
		2011-11-01	Baseline	NEL
		2011-11-01	Baseline	NEL
		2011-10-28	Baseline	NWL
		2011-10-06	Baseline	NWL
HZMB 053		2012-09-04	425	NWL
HZMB 052		2012-09-04	423	NWL
HZMB 051	NL213	2013-05-09	644	NWL
		2013-04-01	622	NWL
		2013-02-15	582	NWL
		2013-02-15	581	NWL
		2013-01-28	559	NWL
		2013-01-28	556	NWL
		2012-09-04	422	NWL
HZMB 050		2013-02-15	579	NWL
		2012-09-04	421	NWL
HZMB 049		2012-09-03	419	NWL
HZMB 048		2012-09-03	419	NWL
HZMB 047		2012-09-03	412	NWL
HZMB 046		2012-09-03	412	NWL

Table 1. (con) Sightings of Individually Identified Chinese White Dolphin (*Sousa chinensis*) between March 2012 – May 2013 and Baseline sightings

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
HZMB 045		2013-02-15	579	NWL
		2012-11-01	495	NWL
HZMB 044	NL98	2013-05-09	648	NWL
		2013-05-09	647	NWL
		2013-04-01	623	NWL
		2013-04-01	621	NWL
		2013-02-15	579	NWL
		2012-11-01	495	NWL
HZMB 043		2012-09-03	407	NWL
HZMB 042	NL260	2012-11-01	495	NWL
		2011-11-07	Baseline	NWL
HZMB 041	NL24	2013-05-09	648	NWL
		2013-05-09	647	NWL
		2013-04-01	623	NWL
		2013-04-01	621	NWL
		2013-02-15	579	NWL
		2012-11-01	495	NWL
		2011-11-06	Baseline	NEL
		2011-11-05	Baseline	NWL
		2011-11-05	Baseline	NWL
		2011-10-10	Baseline	NWL
HZMB 040		2013-02-21	589	NWL
		2012-11-01	493	NWL
HZMB 038		2012-11-01	490	NWL
HZMB 037		2012-11-01	490	NWL
HZMB 036		2012-11-01	490	NWL
		2012-09-03	407	NWL
HZMB 035		2013-02-15	579	NWL
		2012-11-01	490	NWL
HZMB 034		2012-11-01	493	NWL
HZMB 028		2013-04-01	625	NWL
		2012-08-06	373	NWL

Table 1. (con) Sightings of Individually Identified Chinese White Dolphin (*Sousa chinensis*) between March 2012 – May 2013 and Baseline sightings

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
HZMB 027		2013-02-15	579	NWL
		2013-01-28	568	NWL
		2013-01-28	564	NWL
		2012-06-14	299	NWL
HZMB 026		2013-05-09	642	NWL
		2013-01-28	561	NWL
		2012-06-13	295	NEL
HZMB 025		2013-02-22	596	NEL
		2013-02-21	591	NWL
		2012-06-13	295	NEL
HZMB 024		2013-03-18	601	NWL
		2012-06-13	295	NEL
HZMB 023		2013-04-01	619	NWL
		2013-02-21	589	NWL
		2013-02-15	579	NWL
		2012-07-10	330	NWL
HZMB 022		2013-04-01	619	NWL
		2013-02-21	589	NWL
		2013-02-15	579	NWL
		2012-07-10	330	NWL
HZMB 021	NL37	2012-07-10	330	NWL
		2011-09-16	Baseline	NWL
HZMB 020		2012-07-10	330	NWL
HZMB 019		2012-07-10	330	NWL
HZMB 018		2013-05-09	647	NWL
		2013-02-21	594	NEL
		2012-12-10	529	NEL
		2012-07-10	330	NWL
HZMB 017		2012-07-10	330	NWL
HZMB 016		2012-12-11	539	NWL
		2012-09-18	446	NWL
		2012-09-04	421	NWL
		2012-07-10	330	NWL
HZMB 015		2012-07-10	330	NEL
HZMB 014	NL176	2012-08-06	373	NWL
		2012-06-13	295	NEL
		2011-11-06	Baseline	NEL
		2011-11-01	Baseline	NEL
		2011-11-01	Baseline	NEL
HZMB 013		2012-05-28	281	NWL
HZMB 012		2012-05-28	281	NWL
HZMB 011	EL01	2013-02-22	597	NEL
		2013-02-21	592	NEL
		2013-02-14	572	NEL
		2012-11-06	517	NEL
		2012-09-19	452	NWL
		2012-03-31	261	NEL
		2011-11-02	Baseline	NWL
		2011-11-01	Baseline	NEL
HZMB 009		2012-05-28	281	NWL
HZMB 008		2012-05-28	281	NWL
HZMB 007	NL246	2012-12-10	529	NEL

Table 1. (con) Sightings of Individually Identified Chinese White Dolphin (*Sousa chinensis*) between March 2012 – May 2013 and Baseline sightings

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
HZMB 006		2013-02-21	594	NEL
		2012-12-11	539	NWL
		2012-11-01	495	NWL
		2012-03-29	250	NWL
HZMB 005		2012-12-10	532	NWL
		2012-08-06	374	NWL
		2012-05-28	287	NWL
HZMB 004		2012-09-04	421	NWL
		2012-03-31	262	NWL
HZMB 003	NL179	2012-12-10	529	NEL
		2012-03-31	261	NWL
		2011-11-06	Baseline	NEL
		2011-09-16	Baseline	NWL
HZMB 002	WL111	2013-02-14	573	NWL
		2012-12-11	536	NWL
		2012-12-11	535	NWL
		2012-10-12	466	NWL
		2012-10-24	475	NWL
		2012-05-28	281	NWL
		2012-03-29	250	NWL
HZMB 001	WL46	2013-04-01	617	NWL
		2013-02-14	573	NWL
		2012-03-29	250	NWL
	CH98	2011-11-02	13	NWL
	NL11	2011-11-02	12	NWL
		2011-11-07	Baseline	NWL
	NL12	2011-11-02	Baseline	NWL
	NL33	2011-09-23	Baseline	NWL
		2011-11-01	Baseline	NEL
		2011-11-05	Baseline	NWL
		2011-11-07	Baseline	NWL
	NL37	2011-09-16	Baseline	NWL
	NL46	2011-10-28	Baseline	NWL
	NL48	2011-09-16	Baseline	NWL
		2011-11-02	Baseline	NWL
		2011-11-07	Baseline	NWL
	NL75	2011-09-16	Baseline	NWL
		2011-09-16	Baseline	NWL
		2011-11-01	Baseline	NEL
	NL80	2011-11-02	Baseline	NWL
	NL93	2011-11-05	Baseline	NWL
		2011-11-07	Baseline	NWL
	NL98	2011-10-06	Baseline	NEL
		2011-11-01	Baseline	NEL
		2011-11-06	Baseline	NEL
		2011-11-07	Baseline	NWL
	NL120	2011-10-10	Baseline	NWL
		2011-11-06	Baseline	NEL
	NL123	2011-10-06	Baseline	NWL
		2011-10-10	Baseline	NWL
		2011-11-06	Baseline	NEL

Table 1. (con) Sightings of Individually Identified Chinese White Dolphin (*Sousa chinensis*) between March 2012 – May 2013 and Baseline sightings

Identification Number	Baseline Identification Number	Date (YYYY-MM-DD)	Sighting Number	Area Sighted
	NL214	2011-10-28 2011-11-02 2011-11-05	Baseline Baseline Baseline	NWL NWL NWL
	NL220	2011-10-10	Baseline	NEL
	NL224	2011-10-28	Baseline	NWL
	NL226	2011-11-05	Baseline	NWL
	NL230	2011-11-02	Baseline	NWL
	NL233	2011-09-16 2011-10-06 2011-10-28	Baseline Baseline Baseline	NWL NWL NWL
	NL241	2011-09-16 2011-11-02 2011-11-07	Baseline Baseline Baseline	NWL NWL NWL
	NL244	2011-11-01 2011-11-01	Baseline Baseline	NWL NEL
	NL246	2011-09-16 2011-11-06	Baseline Baseline	NWL NEL
	NL256	2011-11-02	Baseline	NWL
	NL258	2011-09-16	Baseline	NWL
	NL259	2011-11-07	Baseline	NWL
	NL261	2011-11-01	Baseline	NEL
	NL264	2011-09-23 2011-10-06 2011-11-06	Baseline Baseline Baseline	NWL NEL NEL
	NL269	2011-11-02	Baseline	NWL
	NL272	2011-09-16 2011-10-28 2011-11-02 2011-11-05	Baseline Baseline Baseline Baseline	NWL NWL NWL NWL
	NL278	2011-11-02	Baseline	NWL
	NL279	2011-11-02	Baseline	NWL
	SL42	2011-11-02	Baseline	NWL
	SL43	2011-10-28	Baseline	NWL
	WL04	2011-09-16 2011-10-10 2011-11-02 2011-11-05	Baseline Baseline Baseline Baseline	NWL NWL NWL NWL
	WL05	2011-11-01 2011-11-01	Baseline Baseline	NEL NEL
	WL11	2011-11-07	Baseline	NWL
	WL25	2011-09-16	Baseline	NWL
	WL88	2011-09-16	Baseline	NWL
	WL111	2011-11-02	Baseline	NWL
	WL116	2011-09-16	Baseline	NWL
	WL124	2011-11-02	Baseline	NWL
	WL156	2011-10-28	Baseline	NWL
	WL162	2011-09-16	Baseline	NWL

HZMB Code	HZMB001
AFCD Code	WL46 (FROM 19-05-11)
Name	Ropey
Sex	
Distinguishing features	Partial Removed Fin Spotted
Note	Assumed previously sighted with rope around body causing deep gauge into front dorsal fin – rope cut through fin and partially tore off
Match	RHS


2012-03-29


2013-02-14


2013-02-14


2013-04-01

HZMB Code	HZMB 018
AFCD Code	COMPARED TO BASELINE CATALOGUE – NO MATCH
Name	
Sex	Female (with calf)
Distinguishing features	Nick small ill defined Pigment spotted Dorsal apex rounded
Note	
Match	2012-12-10 LHS


2012-12-10


2012-12-10


2013-02-21


2013-02-21


2013-05-09

HZMB Code	HZMB022
AFCD Code	COMPARED TO BASELINE CATALOGUE – NO MATCH
Name	
Sex	
Distinguishing features	Deep V-shaped nick fore dorsal Pigment spotted
Note	Fore Fin – clean slice prop damage or fishing line abrasion
Match	2013-02-15 RHS


2013-02-15


2013-02-21


2013-04-01

HZMB Code	HZMB023
AFCD Code	COMPARED TO BASELINE CATALOGUE – NO MATCH
Name	
Sex	
Distinguishing features	Dorsal fin apex missing Small, rounded nicks along dorsal
Note	
Match	2013-02-21 LHS


2013-02-21


2013-02-21


2013-04-01

HZMB Code	HZMB024
AFCD Code	COMPARED TO BASELINE CATALOGUE – NO MATCH
Name	
Sex	
Distinguishing features	Nick 0 Notch 0 Scar RHS aft dorsal rakes Pigment spot on grey
Note	
Match	Yes


2012-06-13


2013-03-18

HZMB Code	HZMB 026
AFCD Code	COMPARED TO BASELINE CATALOGUE – NO MATCH
Name	
Sex	Female (with calf below)
Distinguishing features	Nick half square mid dorsal Notch Scar Pigment spotted
Note	2013-01-28
Match	


2013-01-28


2013-01-28


2013-05-09


2013-05-09

HZMB Code	HZMB028
AFCD Code	COMPARED TO BASELINE CATALOGUE – NO MATCH
Name	
Sex	
Distinguishing features	Nick Notch Scar notched trailing edge and spine Pigment spotted
Note	Very rounded apex
Match	Yes


2012-08-06


2013-04-01


2013-04-01

HZMB Code	HZMB 041
AFCD Code	NL24 (possible)
Name	
Sex	Female with calf (2012-11-01 below)
Distinguishing features	Apex dorsal missing V-shape notch base dorsal fin RHS
Note	2012-11-01
Match	2013-02-15 LHS


2012-11-01


2013-02-15


2013-02-15


2013-04-01


2013-05-09

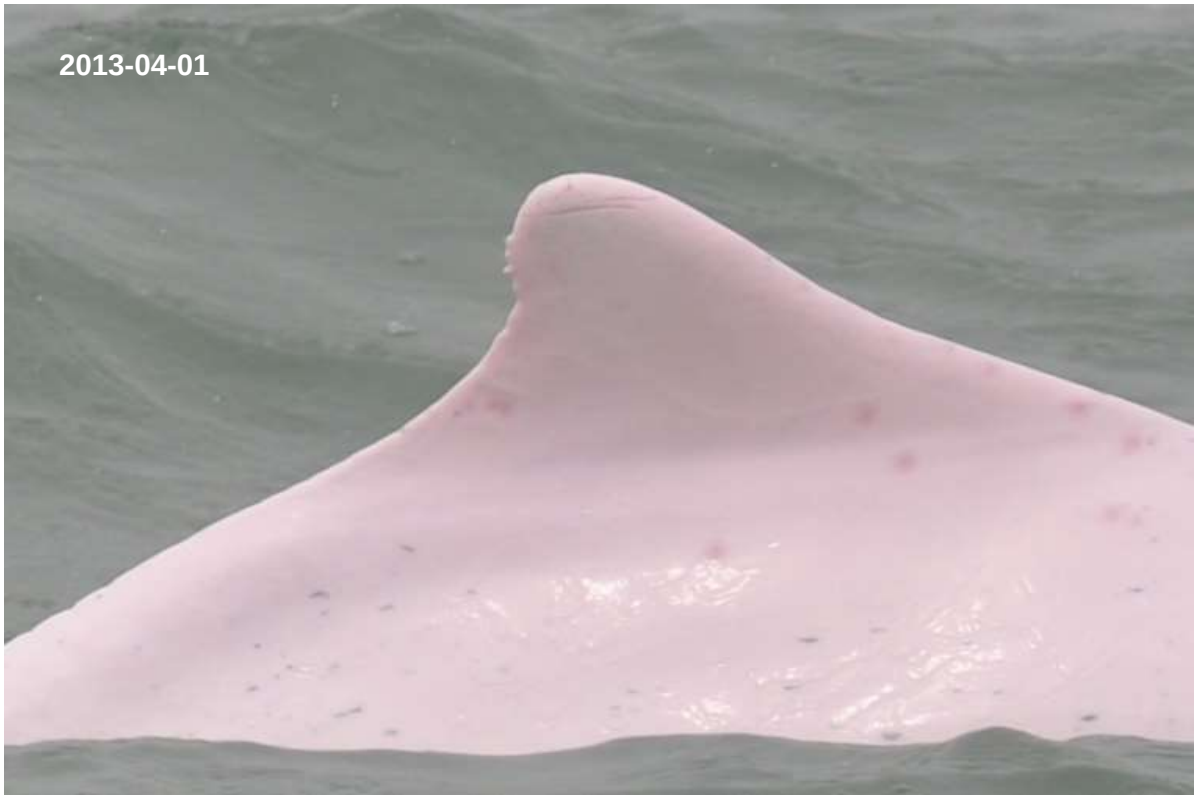

2013-05-09

HZMB Code	HZMB 044
AFCD Code	NL98
Name	
Sex	Female (with calf 2013-04-01)
Distinguishing features	Rounded fin apex Notch x 3 mid dorsal V-shape nick mid dorsal LHS
Note	2012-11-01
Match	2013-02-15 LHS


2013-02-15


2013-02-15

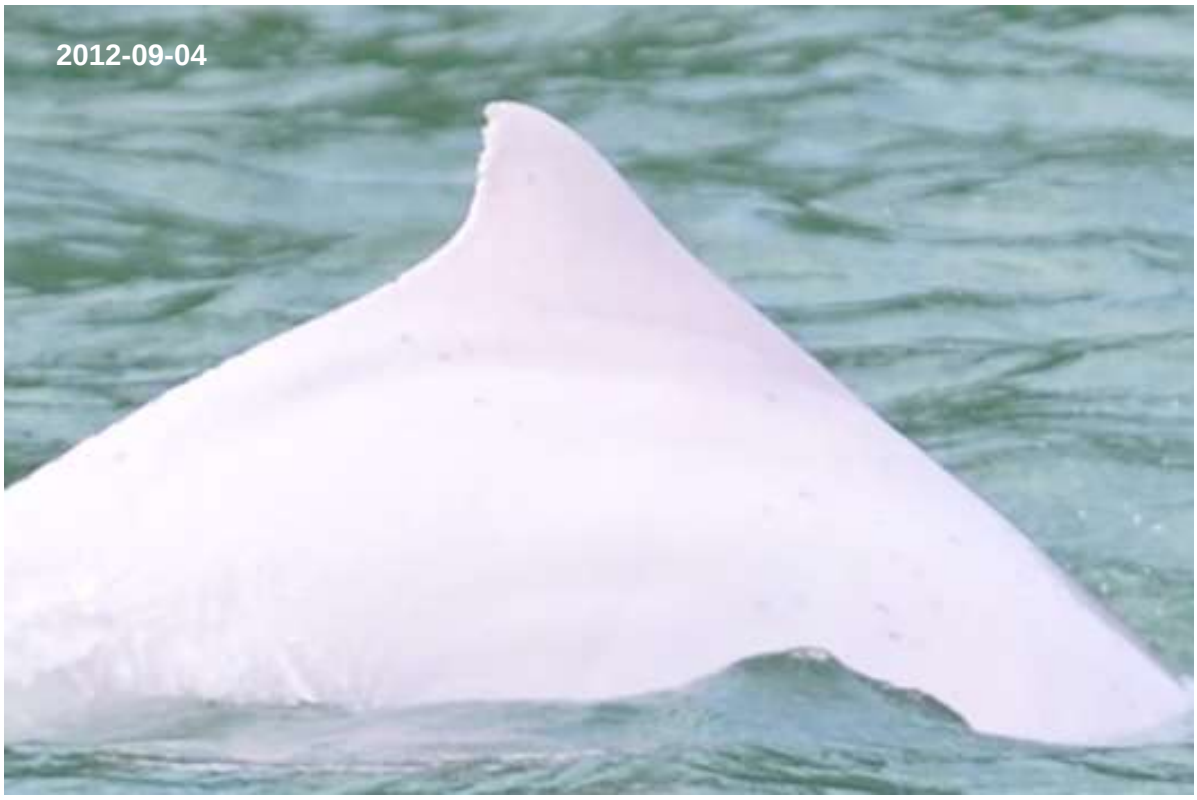

2013-04-01


2013-04-01


2013-04-01


2013-05-09


2013-05-09



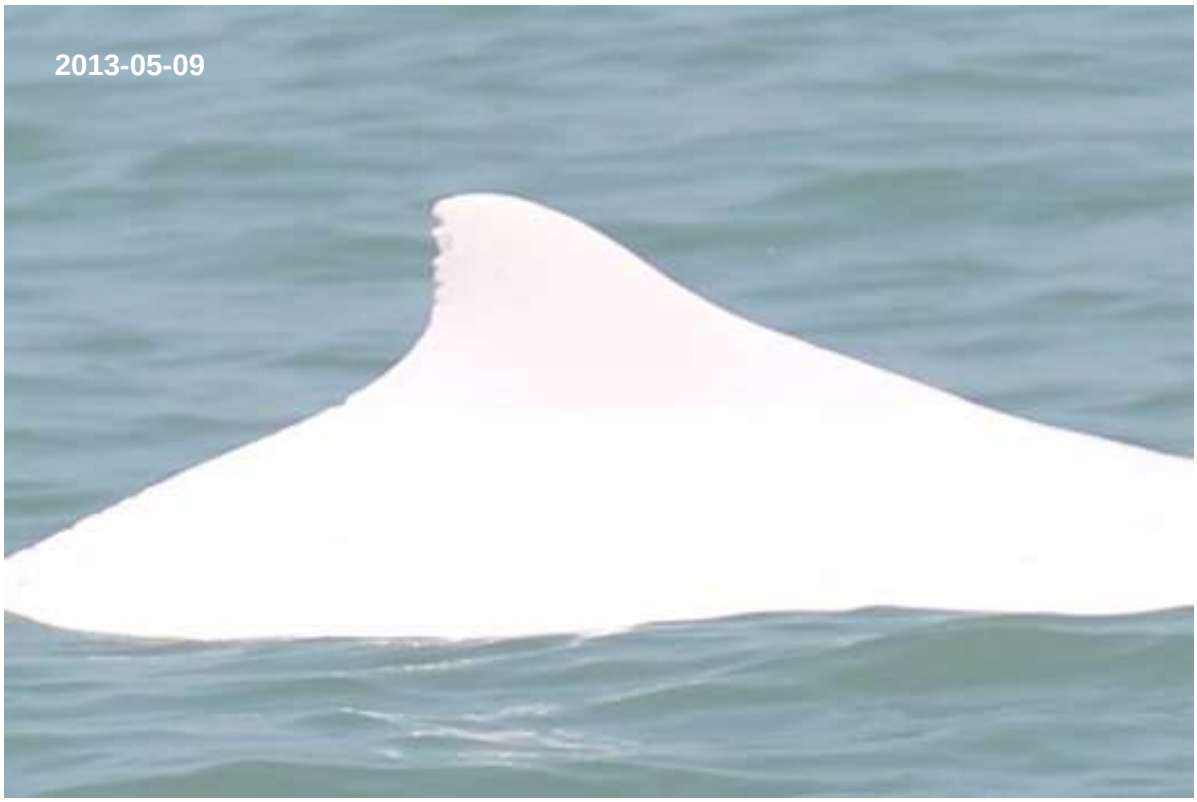
HZMB Code	HZMB 051
AFCD Code	NL213
Name	
Sex	
Distinguishing features	Notch apex dorsal Deep v-shape nick top dorsal Notch top dorsal V-shape nick top dorsal Shallow nick mid-dorsal
Note	
Match	2013-01-28 RHS


2013-01-28


2013-02-15


2013-02-15

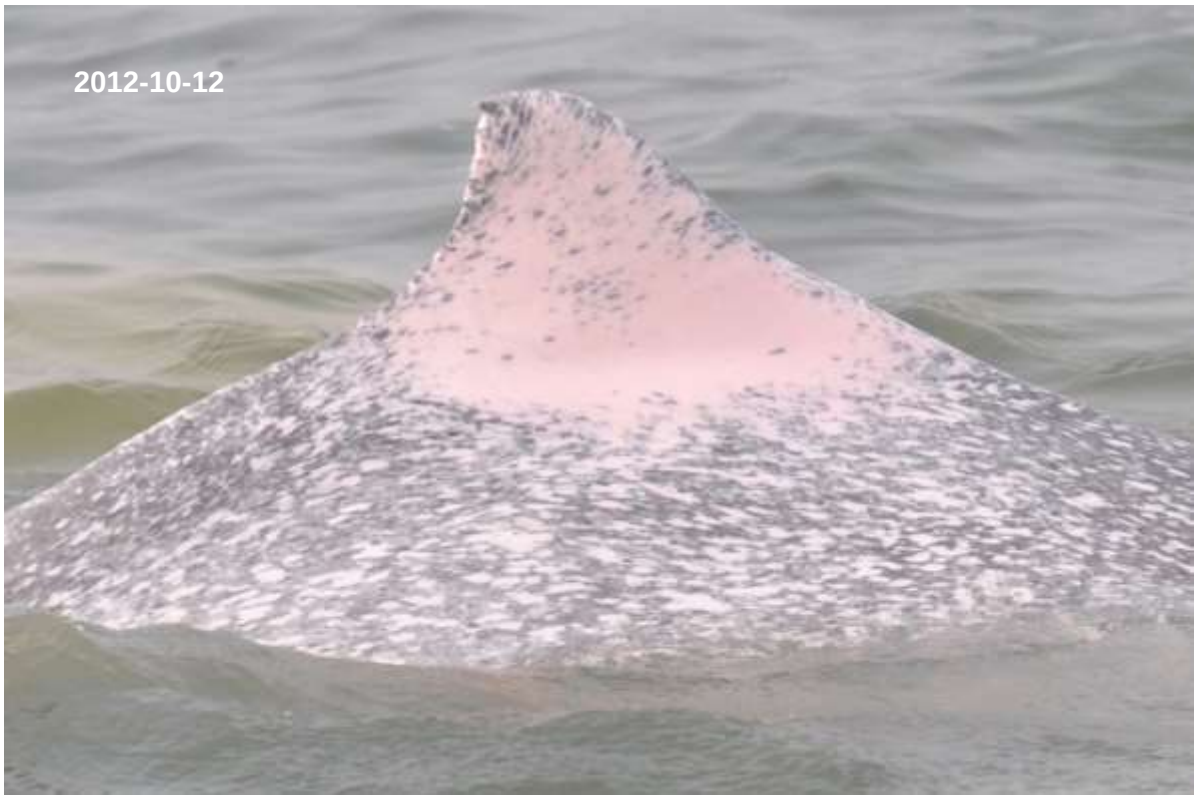

2013-04-01


2013-05-09


2013-05-09

HZMB Code	HZMB 063
AFCD Code	COMPARED TO BASELINE CATALOGUE – NO MATCH
Name	
Sex	
Distinguishing features	Notch mid-dorsal Nick x 2 mid-dorsal Marbled RHS
Note	2012-10-12
Match	


2012-05-09



HZMB Code	HZMB 064
AFCD Code	COMPARED TO BASELINE CATALOGUE – NO MATCH
Name	
Sex	
Distinguishing features	Notch apex dorsal Nick top dorsal Marbled RHS
Note	2012-01-28
Match	


2013-01-28


2013-05-09

HZMB Code	HZMB 073
AFCD Code	COMPARED TO BASELINE CATALOGUE – NO MATCH
Name	
Sex	Female (with calf below)
Distinguishing features	Nick apex dorsal Rounded notch base dorsal Spotted leading edge fin LHS
Note	2012-12-06
Match	2012-12-10 RHS


2012-12-10


2012-12-10


2013-02-21


2013-04-01


2013-04-01


2013-05-09

HZMB Code	HZMB 074
AFCD Code	COMPARED TO BASELINE CATALOGUE – NO MATCH
Name	
Sex	Calf of HZMB 073
Distinguishing features	Rounded nick top dorsal Notch top dorsal 2 shallow nick mid dorsal LHS
Note	2012-12-06
Match	2013-05-09 RHS


2012-12-10


2013-02-21


2013-04-01


2013-05-09


2013-05-09

HZMB Code	HZMB083
AFCD Code	NL136
Name	
Sex	
Distinguishing features	Rounded apex Shallow nick apex dorsal Square notch top dorsal Rounded nick/square notch mid dorsal V nick base dorsal Rounded nick base dorsal
Note	2013-01-28
Match	2013-01-28 RHS


2013-01-28


2013-02-15


2013-03-28


2013-03-28

HZMB Code	HZMB 086
AFCD Code	NL242
Name	
Sex	
Distinguishing features	Round indentation side dorsal Small v nick apex dorsal Shallow nick top dorsal 2 x v nick top- to mid-dorsal Notch base dorsal Square nick base dorsal V nick base dorsal RHS
Note	2013-02-15
Match	2012-05-09 LHS


2013-05-09


2013-05-09

HZMB Code	HZMB 093
AFCD Code	COMPARED TO BASELINE CATALOGUE – NO MATCH
Name	
Sex	
Distinguishing features	Shallow nick apex dorsal Notch apex dorsal V nick top dorsal Notch top dorsal 3 x shallow nicks along base dorsal
Note	2013-02-21
Match	2013-05-24 RHS


2013-05-24


2013-05-24

HZMB Code	HZMB094
AFCD Code	COMPARED TO BASELINE CATALOGUE – NO MATCH
Name	
Sex	
Distinguishing features	Indent apex fore dorsal Rounded apex Shallow nick top dorsal Rounded nick mid dorsal 2 x shallow v nick base dorsal
Note	2013-03-18
Match	RHS 2013-03-18


2013-03-18

HZMB Code	HZMB095
AFCD Code	COMPARED TO BASELINE CATALOGUE – NO MATCH
Name	
Sex	
Distinguishing features	Rounded notch mid-dorsal V-nick beneath notch Severe rake marks along dorsal
Note	2013-04-01
Match	

HZMB Code	HZMB096
AFCD Code	COMPARED TO BASELINE CATALOGUE – NO MATCH
Name	
Sex	
Distinguishing features	LHS
Note	2012-06-13 2013-04-01
Match	


2013-04-01

HZMB Code	HZMB 097
AFCD Code	COMPARED TO BASELINE CATALOGUE – NO MATCH
Name	
Sex	
Distinguishing features	Notch x 3 top to mid dorsal Square nick x 2 top dorsal
Note	2013-05-09
Match	2013-05-09 RHS


2013-05-09

HZMB Code	HZMB 098
AFCD Code	NL104
Name	
Sex	Female (with calf below)
Distinguishing features	Apex dorsal missing Shallow nick x 3 top to mid dorsal Rounded notch mid dorsal Deep v nick base dorsal
Note	2013-05-24
Match	


2013-05-24

China Harbour Engineering Company Limited

Monthly Summary Waste Flow Table for May / 2013 (year)

Project : Hong Kong – Zhuhai – Macao Bridge, Hong Kong Boundary Crossing Facilities – Reclamation Works Contract No.: HY/2010/02

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete (see Note 1)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 2)	Chemical Waste (see Note 4)	Others, e.g. general refuse (see Note 3)
	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000m^3)	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000 m^3)
Jan-13	0.0000	0.0000	0.0000	0.0000	0.0000	100.2272	0.0000	0.0000	0.0000	1.4000	0.0325
Feb-13	0.0000	0.0000	0.0000	0.0000	0.0000	49.3183	0.0000	0.0000	0.0000	0.2000	0.0195
Mar-13	0.0000	0.0000	0.0000	0.0000	0.0000	121.1545	0.0000	0.0000	0.0000	2.0000	0.0130
Apr-13	0.0000	0.0000	0.0000	0.0000	0.0000	197.7428	0.0000	0.0000	0.0000	0.0000	0.0260
May-13	0.0000	0.0000	0.0000	0.0000	0.0000	360.3733	0.0000	0.0000	0.0000	1.2000	0.0130
Jun-13											
Sub-total	0.0000	0.0000	0.0000	0.0000	0.0000	828.8162	0.0000	0.0000	0.0000	4.8000	0.1040
Jul-13											
Aug-13											
Sep-13											
Oct-13											
Nov-13											
Dec-13											
Total	0.0000	0.0000	0.0000	0.0000	0.0000	828.8162	0.0000	0.0000	0.0000	4.8000	0.1040

Notes: (1) Broken concrete for recycling into aggregates.

(2) Plastics refer to plastic bottles/ containers, plastic sheets/ foam from packaging materials.

(3) Use the conversion factor : 1 full load of dumping truck being equivalent to 6.5m^3 by volume.

(4) Chemical waste refer to spent “battery” and “oil with water”.

Appendix J
Cumulative Statistics on Exceedances, Complaints, Notifications of Summons and Successful Prosecutions

Cumulative statistics on Exceedances

		Total no. recorded in this month	Total no. recorded since project commencement
1-Hour TSP	Action	-	-
	Limit	-	-
24-Hour TSP	Action	-	-
	Limit	-	-
Noise	Action	-	-
	Limit	-	-
Water Quality	Action	-	-
	Limit	-	-

Remarks: Exceedances which are not project-related are not presented in this table.

Cumulative statistics on Exceedances, Complaints, Notifications of Summons and Successful Prosecutions

	Date Received	Subject	Status	Total no. received in this quarter	Total no. received since project commencement
Environmental complaints	04 March13	One (1) complaint was referred by EPD to ET regarding the construction noise impact from cranes operating from the barges for the Hong Kong –Zhuhai-Macao Bridge Hong Kong Project generating squeak noise in the evening of 1 Mar 2013 causing annoyance to him/her. The investigation results show that the complaint was non-project related.	Closed	4	5
	08 April13	One (1) complaint was referred by	Closed	4	6

		EPD regarding oil dumping observed from various vessels operating for HZMB HK projects near Tung Chung Development Pier over the past few months. The investigation results showed that the complaint was non-project related.			
	10 May 2013	A complaint referred to the Contractor by EPD on 10 May 2013 regarding the scattered debris of silt curtain noted at Sha Lou Wan and Tung Chung Bay. Immediate inspection and clean up action was taken by the Contractor.	Closed	4	7
	23 May 2013	A follow-up complaint referred by EPD was received on 23 May 2013 regarding the oil stain noted near Tung Chung Development Pier for past few months.	Closed	4	8
Notification of summons	29 April13	As informed by the Contractor on 9 May 13, one summons was received on 29 April 13 regarding the suspected violation case of Noise Control Ordinance (Cap.400) at Works Area WA4 on 31 Oct 2012.	-	1	1
Successful Prosecutions	-	-	-	0	0

Appendix K – Event Action Plan

Event / Action Plan for Air Quality

Event	Action			
	ET Leader	IEC	ER	Contractor
Action Level				
Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform IEC and ER; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily.	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.
Exceedance for two or more consecutive samples	1. Identify source; 2. Inform IEC and ER; 3. Advise the ER on the effectiveness of the proposed remedial measures; 4. Repeat measurements to confirm findings; 5. Increase monitoring frequency to daily; 6. Discuss with IEC and Contractor on remedial actions required; 7. If exceedance continues, arrange meeting with IEC and ER; 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 on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise Implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Submit proposals for remedial to ER within 3 working days of notification; 2. Implement the agreed proposals; 3. Amend proposal if appropriate.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Limit Level				
Exceedance for one sample	1. Identify source, investigate the causes of exceedance and propose remedial measures; 2. Inform ER, Contractor and EPD; 3. Repeat measurement to confirm finding; 4. Increase monitoring frequency to daily; 5. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.	1. Check monitoring data submitted by ET; 2. Check Contractor's working method; 3. Discuss with ET and Contractor on possible remedial measures; 4. Advise the ER on the effectiveness of the proposed remedial measures; 5. Supervise implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Ensure remedial measures properly implemented.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 working days of notification; 3. Implement the agreed proposals; 4. Amend proposal if appropriate.

Report No. **D001**
Monitoring Period **March 2013- May 2013**

The Action and Limit Levels of Chinese White Dolphin (CWD) monitoring which was extracted from the enhanced Event and Action Plan[#] are reproduced below:

	North Lantau Social Cluster	
	NEL	**NWL**
Action Level	(STG<4.2) & (ANI<15.5)	(STG<6.9) & (ANI<31.3)
Limit Level	[(STG<2.4) & (ANI<8.9)] AND [(STG<3.9) & (ANI<17.9)]	

Quarterly Encounter Rate

	NEL	NWL	Level Exceeded
STG*	0.00	3.00	Limit Level
ANI**	0.00	8.60	

Investigation Results:

a) Causes of exceedance

- After review of all available and relevant data, including the raw data and analyses of other parameters included in the EM&A, no significant variation is detected in key environmental parameters. Historic data noting the number of dolphins in NEL shows that there is natural variation of dolphin numbers and the number of dolphins noted for this period in 2013 is within previously noted numbers.
- No direct relationship with Project construction activities can be found between either the increase or decrease of dolphin numbers in NEL.
- Other source of impact: the trawl ban in Hong Kong waters commenced on 31December 2012 and non-project related dredging activities have been observed in NEL since November 2012.
- Current mitigation measures are being upheld.
- There has been no failure or reduction of dolphin-specific mitigation measures.

There is no evidence that exceedances are related to Project works.

b) Action required under the action plan
Please refer to corresponding Event and Action Plan.

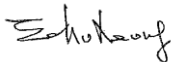
c) Action taken under the action plan
1. Statistical data analysis has been repeated to confirm findings;
2. All available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&A have been reviewed;
3. Identification of source of impact was carried out;
4. The IEC, ER and Contractor have been informed of findings;
5. Monitoring data have been checked
6. Repeated review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary;
7. After investigation, no evidence that exceedances are related to Project works.

d) ET's conclusions and recommendations for mitigation
Current mitigation measures for CWD are being implemented fully, and the Contractor has been reminded to consistently implement exisiting mitigation measures.

e) Contractor's actions to implement the mitigation
N/A

Please refer to the attachment for the full investigation result.

[#] Reference is made to the enhanced Event Action Plan for Chinese White Dolphin Monitoring accepted by EPD on 7 May 2013.
*Quarterly Average Encounter Rate of Number of Dolphin Sightings (STG) presents averaged encounter rates of the three monitored months in terms of groups per 100km per survey event.
**Quarterly Average Encounter Rate of Total Number of Dolphins (ANI) presents averaged encounter rates of the three monitored months in terms of individuals per 100km per survey event.

ET Leader Signature & Date:  17-Sep-13

Report No. **D001**
Monitoring Period **March 2013- May 2013**

Investigation Report Attachment

1. Review all available and relevant data, including raw data and analyses of other parameters covered in the EM&A, to ascertain if differences are a result of natural variation or previously observed seasonal differences.

From the data provided by CHEC and following ongoing discussion and review, it can be surmised that, since February/March 2013, there have been a few differences in construction activities at the Project (HKBCF). The new or changed construction activities identified at HKBCF are

- Sand blanket
- Sand filling
- Cellular Structure Construction (ceased on October 25th and restarted February)

From discussion, it is understood that sand blanketing and filling are similar procedures which entail sand being poured first over geotextile material and then filled to form land. This has occurred in section C which is located mid-site and away from those areas which dolphins had been seen during the autumn and winter months. Although no specific noise levels are required to be collected from sand blanketing/filling activities, it is anticipated that it would be of a low frequency given that the sand is dropped into relatively shallow water. Sound dissipates relatively quickly in shallow water Further, the data collected pertaining to level of suspended solids (SS), increases in which may affect dolphin prey distribution, indicate that no increased sedimentation has occurred outside the filled area thus it is unlikely that sand blanketing/filling activities have affected fish and thus dolphin, distribution.

Cellular Structure Construction was already underway during both summer and autumn months, at a time when dolphins were regularly seen in NEL waters. The number of dolphins in NEL began to decrease in November 2012, *after* the cessation of the cellular structure construction and continued to decrease throughout the winter months when there was no further cellular construction work. Thus, there appears to be no relationship with cellular construction work and the number of dolphin sightings in NEL.

AFCD Annual Monitoring data indicates that NEL is less frequently used by the dolphin population in the winter and spring months. This is shown in annual reports and was also the case in 2012 when dolphin numbers were low in NEL during the same period, March – May (and later into the summer). It is noted that AFCD annual reports use a different method of calculating encounter rates and dolphin occurrence in Hong Kong compared to that stated in the EAP and it is difficult to compare the EAP calculations directly to the historic data, however, the pattern of variable habitat use is consistent across both data sets. In addition, AFCD data show that the Hong Kong dolphin population has been in decline for the last decade, considerably before works commenced at HKBCF. Population decline will make natural fluctuations of the populations more prominent, i.e., the low numbers usually recorded in NEL will be lower than previous years as the population size decreases (there are physically less dolphins).

2. Identify source(s) of impacts.

An immediate source of "impact" or factor which is influencing dolphin occurrence in general, is the long term decline which has been documented by AFCD over the last decade. As yet, little information is available on the causal factors of dolphin population decline in Hong Kong waters and how any construction activities may affect this.

Availability of prey is a primary driver of dolphin distribution. On 31st December 2012, commercial trawling activities ceased in Hong Kong waters. The purpose of the trawl ban is to improve fish stocks and, as such, is anticipated to fundamentally change fish availability, distribution and productivity in local waters.

At this time, the impact of the trawl ban on dolphins is not known. It is of course positive for the fisheries as there is less pressure on the stocks and concomitantly, it is assumed that an increased abundance of prey species will also be positive for the dolphins.

From January to date, dolphins have been sighted following fishing trawlers in mainland Chinese waters adjacent to transect lines 1 and 20. This is not part of the impact monitoring designated area, however, and it is not possible to photographically identify the dolphins as they swim in mainland Chinese waters. As sufficient data is gathered, analyses of individual frequency of occurrence, movement patterns and feeding behavior shall be conducted to investigate the effect.

It has been noted in monthly reports that dredging activities have been occurring in NEL since November 2012. This is not part of any project but is located in the area where the contaminated muds pits are being extended. Dredging is known to cause dolphins to abandon their habitat. Dredging activities in NEL may be exacerbating the seasonal low occurrence of dolphins in NEL and further, it is noted that dolphin numbers began to decrease in December 2012.

3. Repeat review to ensure all the dolphin protective measures are fully and properly implemented and advise if additional measures are necessary.

Discussion with CHEC have ensured that current mitigation measures are being upheld and that key environmental parameters have not significantly changed. The same period in 2012, March-May, also noted a low occurrence of dolphins in NEL and dolphin numbers increased again in the late summer months of 2012 (a pattern which has also been shown by AFCD long term monitoring data).

4. Investigate whether the exceedance was caused by any of the construction activity associated with the works contract.

No construction works associated with the Project can be found that coincide with low dolphin numbers in NEL. Whereas AFCD data indicate that the Hong Kong dolphin population is certainly decreasing, this is on top of a natural tendency for dolphins to vacate NEL during this period (March – May and later). At this time, the dolphin population residency in NEL is following a seasonal pattern which has been recorded for many years. Further, fishing practices which directly affect dolphin distribution, i.e., trawling. This, in turn, may lead to dolphins following trawlers to different areas. Without longer term data, it is not possible at this time to know if increased numbers of dolphins will return to NEL during the late summer months, as they have done in past years, including 2012.

In summary, no causal relationship with any one construction activity at the Project site can be found to link directly with the reduced habitat use of NEL during the last quarter. A decline in NEL use in this period last year also occurred and this pattern is consistent with the seasonal variation of habitat use recorded in the AFCD long term data set. Two factors outside the Project activities have had the potential to directly affect dolphin distribution in NEL during this period; dredging works at the Brothers Islands and a change in fishing practices.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Exceedance for two or more consecutive samples	1. Notify IEC, ER, Contractor and EPD; 2. Identify source; 3. Repeat measurement to confirm findings; 4. Increase monitoring frequency to daily; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Arrange meeting with IEC and ER to discuss the remedial actions to be taken; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 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 determined by the ER until the exceedance is abated.

Event / Action Plan for Construction Noise

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Action Level	1. Notify IEC and Contractor; 2. Identify source, investigate the causes of exceedance and propose remedial measures; 3. Report the results of investigation to the IEC, ER and Contractor; 4. Discuss with the Contractor and formulate remedial measures; 5. Increase monitoring frequency to check mitigation effectiveness.	1. Review the analysed results submitted by the ET; 2. Review the proposed remedial measures by the Contractor and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures are properly implemented.	1. Submit noise mitigation proposals to IEC; 2. Implement noise mitigation proposals.
Limit Level	1. Inform IEC, ER, EPD and Contractor; 2. Identify source; 3. Repeat measurements to confirm findings; 4. Increase monitoring frequency; 5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; 6. Inform IEC, ER and EPD the causes and actions taken for the exceedances; 7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results; 8. If exceedance stops, cease additional monitoring.	1. Discuss amongst ER, ET, and Contractor on the potential remedial actions; 2. Review Contractors remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly; 3. Supervise the implementation of remedial measures.	1. Confirm receipt of notification of failure in writing; 2. Notify Contractor; 3. Require Contractor to propose remedial measures for the analysed noise problem; 4. Ensure remedial measures properly implemented; 5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	1. Take immediate action to avoid further exceedance; 2. Submit proposals for remedial actions to IEC within 3 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 determined by the ER until the exceedance is abated.

Event / Action Plan for Water Quality

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Action level being exceeded by one sampling day	1. Repeat *in situ* measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor and ER; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Repeat measurement on next day of exceedance to confirm findings.	1. Check monitoring data submitted by ET and Contractor's working methods; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; 4. Assess the effectiveness of the implemented mitigation measures.	1. Confirm receipt of notification of non-compliance in writing; 2. Discuss with IEC on the proposed mitigation measures; 3. Make agreement on mitigation measures to be implemented; 4. Ensure mitigation measures are properly implemented.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment and consider changes of working methods; 4. Discuss with ET and IEC on possible remedial actions and propose mitigation measures to IEC and ER; 5. Implement the agreed mitigation measures. 6. Amend working methods if appropriate.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Action level being exceeded by two or more consecutive sampling days	1. Repeat *in situ* measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor and ER; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Action level; 8. Repeat measurement on next day of exceedance to confirm findings.	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; 4. Assess the effectiveness of the implemented mitigation measures.	1. Confirm receipt of notification of non-compliance in writing; 2. Discuss with IEC on the proposed mitigation measures; 3. Make agreement on mitigation measures to be implemented; 4. Ensure mitigation measures are properly implemented; 5. Assess the effectiveness of the implemented mitigation measures.	1. Inform the Engineer and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment and consider changes of working methods; 4. Discuss with ET and IEC on possible remedial actions and propose mitigation measures to IEC and ER within 3 working days of notification; 5. Implement the agreed mitigation measures; 6. Amend working methods if appropriate.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Limit level being exceeded by one sampling day	1. Repeat *in-situ* measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, Contractor, ER and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit level.	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the proposed mitigation measures submitted by Contractor and advise the ER accordingly; 4. Assess the effectiveness of the implemented mitigation measures.	1. Confirm receipt of notification of failure in writing; 2. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 3. Request Contractor to critically review the working methods; 4. Ensure mitigation measures are properly implemented; 5. Assess the effectiveness of the implemented mitigation measures.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Rectify unacceptable practice; 3. Check all plant and equipment and consider changes of working methods; 4. Submit proposal of mitigation measures to ER within 3 working days of notification and discuss with ET, IEC and ER; 5. Implement the agreed mitigation measures; 6. Amend working methods if appropriate.

Event	Action			
	ET Leader	**IEC**	**ER**	**Contractor**
Limit level being exceeded by two or more consecutive sampling days	1. Repeat *in-situ* measurement to confirm findings; 2. Identify source(s) of impact; 3. Inform IEC, contractor, ER and EPD; 4. Check monitoring data, all plant, equipment and Contractor's working methods; 5. Discuss mitigation measures with IEC, ER and Contractor; 6. Ensure mitigation measures are implemented; 7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.	1. Check monitoring data submitted by ET and Contractor's working method; 2. Discuss with ET and Contractor on possible remedial actions; 3. Review the Contractor's mitigation measures whenever necessary to assure their effectiveness and advise the ER accordingly.	1. Confirm receipt of notification of failure in writing; 2. Discuss with IEC, ET and Contractor on the proposed mitigation measures; 3. Request Contractor to critically review the working methods; 4. Make agreement on the mitigation measures to be implemented; 5. Ensure mitigation measures are properly implemented; 6. Assess the effectiveness of the implemented mitigation measures; 7. Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit level.	1. Inform the ER and confirm notification of the non-compliance in writing; 2. Take immediate action to avoid further exceedance; 3. Rectify unacceptable practice; 4. Check all plant and equipment and consider changes of working methods; 5. Submit proposal of mitigation measures to ER within 3 working days of notification and discuss with ET, IEC and ER; 6. Implement the agreed mitigation measures; 7. Resubmit proposals of mitigation measures if problem still not under control; 8. As directed by the Engineer, to slow down or to stop all or part of the construction activities until no exceedance of Limit level.

Event / Action Plan for Dolphin Monitoring

Event	ET Leader	IEC	ER / SOR	Contractor
Action Level	1. Repeat statistical data analysis to confirm findings; 2. Review all available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&A, to ascertain if differences are as a result of natural variation or previously observed seasonal differences; 3. Identify source(s) of impact; 4. Inform the IEC, ER/SOR and Contractor; 5. Check monitoring data. 6. Review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary.	1. Check monitoring data submitted by ET and Contractor; 2. Discuss monitoring results and finding with the ET and the Contractor.	1. Discuss monitoring with the IEC and any other measures proposed by the ET; 2. If ER/SOR is satisfied with the proposal of any other measures, ER/SOR to signify the agreement in writing on the measures to be implemented.	1. Inform the ER/SOR and confirm notification of the non-compliance in writing; 2. Discuss with the ET and the IEC and propose measures to the IEC and the ER/SOR; 3. Implement the agreed measures.
Limit Level	1. Repeat statistical data analysis to confirm findings; 2. Review all available and relevant data, including raw data and statistical analysis results of other parameters covered in the EM&A, to ascertain if differences are as a result of natural variation or previously observed seasonal differences; 3. Identify source(s) of impact; 4. Inform the IEC, ER/SOR and Contractor of findings; 5. Check monitoring data;	1. Check monitoring data submitted by ET and Contractor; 2. Discuss monitoring results and findings with the ET and the Contractor; 3. Attend the meeting to discuss with ET, ER/SOR and Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures. 4. Review proposals for additional monitoring and any other mitigation measures submitted	1. Attend the meeting to discuss with ET, IEC and Contractor the necessity of additional dolphin monitoring and any other potential mitigation measures. 2. If ER/SOR is satisfied with the proposals for additional dolphin monitoring and/or any other mitigation measures submitted by ET and Contractor and verified by IEC, ER/SOR to signify the agreement in writing on such proposals and any other mitigation measures.	1. Inform the ER/SOR and confirm notification of the non-compliance in writing; 2. Attend the meeting to discuss with ET, IEC and ER/SOR the necessity of additional dolphin monitoring and any other potential mitigation measures. 3. Jointly submit with ET to IEC a proposal of additional dolphin monitoring and/or any other mitigation measures when necessary. 4. Implement the agreed additional dolphin monitoring

	6. Repeat review to ensure all the dolphin protective measures are fully and properly implemented and advise on additional measures if necessary. 7. If ET proves that the source of impact is caused by any of the construction activity by the works contract, ET to arrange a meeting to discuss with IEC, ER/SOR and Contractor the necessity of additional dolphin monitoring and/or any other potential mitigation measures (e.g., consider to modify the perimeter silt curtain or consider to control/temporarily stop relevant construction activity etc.) and submit to IEC a proposal of additional dolphin monitoring and/or mitigation measures where necessary.	by ET and Contractor and advise ER/SOR of the results and findings accordingly. 5. Supervise / Audit the implementation of additional monitoring and/or any other mitigation measures and advise ER/SOR the results and findings accordingly.	3. Supervise the implementation of additional monitoring and/or any other mitigation measures.	and/or any other mitigation measures.