

Proposed Comprehensive Development at Wo Shang Wai, Yuen Long

Quarterly EM&A Summary Report for Feb 2013 – Apr 2013 (Rev. A)

May 2013
Report No.: 266567/56/A

Mott MacDonald

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Heng Shung Construction Co. Ltd.

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Executive Summary

Mott MacDonald Hong Kong Ltd. ("MMHK") has been commissioned by Heng Shung Construction Co. Ltd. to undertake the Environmental Team (ET) services to carry out environmental monitoring and audit (EM&A) for both pre-construction and construction phases of the Proposed Comprehensive Development at Wo Shang Wai, Yuen Long.

This is the 12th Quarterly EM&A Summary report and this report summarises the findings on EM&A during the period from 1 February 2013 to 30 April 2013.

Exceedance of Action and Limit Levels

There was no breach of Action or Limit levels for Air Quality (1-hr TSP and 24-hr TSP) and Noise level (as L_{eq}) in the reporting period. However, exceedances of Action and Limit Levels were recorded for Water Quality at MP3, MP4, MP5 and MP6 on different monitoring dates.

Exceedances of pH, DO, turbidity and SS were observed. The summary of measured water quality is presented in **Section 2.3**.

Investigations have been carried out to identify the causes of exceedance. From investigation, the contractor has implemented water quality mitigation measures as recommended in the EIA report. With external factors affect the adjacent environments, such as natural variations, pond fish culture activities, fish movement, rainstorms and other unknown factors, the exceedances were considered not due to construction works.

Implementation of mitigation measures

Site audits were carried out on a weekly basis during the monitoring period to confirm the implementation of environmental mitigation measures undertaken by the Contractor in the reporting period. The status of implementation of mitigation measures in the site is shown in **Appendix F**.

Record of Complaints

There was no record of complaints received in the reporting period.

Future Key Issues

The major site works scheduled to be commissioned in the coming three months include site formation, foundation work, superstructure and pond drainage management (to lower the water level and remove unwanted species in the pond). Potential environmental impacts due to the construction activities, including air quality, noise, water quality, ecology and landscape and visual, will be monitored.

Environmental mitigation measures will be implemented on site as recommended and weekly site audits will be carried out to ensure that the environmental conditions are acceptable.

1. Introduction

1.1 Background

In March 2005, the Project Proponent, Profit Point Enterprises Limited, acquired the development site in Yuen Long at Wo Shang Wai. An Environmental Impact Assessment (EIA) was then carried out under the EIA Ordinance (EIAO), and the Environmental Permit (EP-311/2008) for construction of the comprehensive development in Wo Shang Wai was first granted by EPD on 9 September 2008 and has been subsequently varied, with the current version (EP-311/2008/D) issued by EPD on 20 March 2013 (i.e. during the reporting period).

The Project involves the residential development and associated infrastructure and wetland restoration area and linear landscape area. The construction works under the Environmental Permit commenced on 12 May 2010. The site formation construction works of the Wetland Restoration Area (hereafter WRA) were completed on 15 November 2010, while the 30-month establishment period of the WRA was concluded in August 2012 – this indicated that planting works as scheduled in the approved Wetland Restoration and Creation Scheme (WRCS; Nov 2009) was complete, except along the western and southern boundary where the planting is affected by the existing site boundary and noise barrier, and for which a Variation to Environmental Permit (EP-311/2008/C) to defer planting at the location was approved. The current valid EP (EP-311/2008/D) includes specific mitigation measures to minimise certain identified noise impacts during the operation phase.

Mott MacDonald Hong Kong Ltd. ("MMHK") has been commissioned by the Contractor, Heng Shung Construction Co. Ltd., to undertake the Environmental Team (ET) services to carry out environmental monitoring and audit (EM&A) for both pre-construction and construction phases of the Proposed Comprehensive Development at Wo Shang Wai, Yuen Long.

This report summarises the findings during the period from 1 February 2013 to 30 April 2013.

1.2 Project Organization

The organisation chart and lines of communication with respect to the on-site environmental management structure together with the contact information of the key personnel are shown in **Appendix A**.

1.3 Environmental Status in the reporting period

During the reporting period, construction works of the Project undertaken include:

- Site formation
- Foundation work

The Construction Works Programme of the Project is provided in **Appendix B**. The general layout plan of the Project site is shown in **Figure 1.1**.

1.4 Summary of EM&A Requirements

The EM&A programme requires environmental monitoring of air quality, noise, water quality, ecology and landscape and visual as specified in the approved EM&A Manual.

A summary of impact EM&A requirements is presented in **Table 1.1** below:

Table 1.1: Summary of Impact EM&A Requirements

Parameters	Descriptions	Locations	Frequencies
Air Quality	24-Hour TSP	ASR1, ASR2A, ASR3, ASR4	Once every 6 days
	1-Hour TSP	ASR1, ASR2A, ASR3, ASR4	3 times every 6 days
Noise	L_{eq}, 30min	NSR1, NSR3, NSR5, NSR7	Weekly
Water Quality	Dissolved Oxygen (DO), temperature, pH, suspended solids (SS) and Biological Oxygen Demand (BOD)	MP1 to MP6	3 days per week
Ecology	Birds	Within the Project Area and Assessment Area of 500m	Weekly
	Dragonflies and Butterflies	Within the Project Area and Assessment Area of 500m	Once per month during Mar and Sep to November, and twice per month during Apr to Aug
	Herpetofauna	Within the Project Area and Assessment Area of 500m	Once per month during Apr to Nov
	Water quality of Wetland Restoration Area (WRA)	WRA	After filling of WRA with water, monthly for in situ water quality and every size months (end of wet season and end of dry season) for laboratory testing
	Site Inspections	Within the Project Area and Assessment Area of 500m	Weekly
Landscape and Visual	Auditing of protection of existing trees, the transplanting of existing trees, the creation of new wetland, the planting of new trees and shrubs and other landscape and visual mitigation measures	CM1 to CM10 and OM1 to OM7 within the Project Area	Site inspections once every two weeks during construction phase; once every two months during operational phase

The Environmental Quality Performance Limits for air quality, noise and water quality are shown in **Appendix C**.

1.5 Recommended Mitigation Measures

The EM&A programme followed the recommended mitigation measures in the EM&A manual. The EM&A requirements as well as the summary of implementation status of the environmental mitigation measures are provided in **Appendix F**. In particular, the following mitigation measures were brought to attention during the site audits during the reporting period:

Air Quality

- All stockpiles should be covered by tarpaulin or kept wet by water spraying;
- All vehicles should be washed to remove any dusty materials before leaving the construction sites;
- The portion of road leading the construction site that is within 30m of a designated vehicle entrance or exit should be kept clear of dusty materials;
- During the dry season, sufficient water spraying should be provided at haul road to reduce dust emission; and
- Ensure proper functioning of the wheel wash facility.

Noise

- Mobile plant should be sited as far away from NSRs as possible;
- Plant known to emit noise strongly in one direction should be orientated to direct noise away from the NSRs; and
- The construction activities should be better scheduled to reduce noise nuisance.

Water Quality

- Water accumulated in the site (including water inside drip trays) should be cleared frequently;
- Ensure proper functioning of the wastewater treatment facility;
- Silt and debris should be removed from the temporary drainage channel regularly; and

Waste Management

- Reuse the excavated materials as far as practical to reduce the amount of waste disposal;
- Ensure drip trays are provided for chemical containers to prevent leakage or soil contamination;
- All plants and vehicles should be properly maintained to prevent oil leakage; and
- Oil stains on soil should be cleared by disposal of contaminated soil.

2. Summary of Monitoring Results

2.1 Air Quality Monitoring

Results and graphical plots of 1-hour TSP and 24-hr TSP at the four monitoring locations are summarised in are shown in **Appendix D**. No exceedance of 1-hour and 24-hour TSP (Action or Limit Level) was recorded in the reporting period.

The weather conditions in the reporting period were affected by frequent interchange of the cooler northeast monsoon and humid maritime airstream between mild easterly airstreams and warm maritime airstream. For details of wind speed and direction during the monitoring period, please refer to the Monthly EM&A reports.

2.2 Construction Noise Monitoring

The construction noise monitoring results and graphical plots are shown in **Appendix D**. No exceedance (Action/Limit Level) of construction noise was recorded in the reporting period.

2.3 Water Quality Monitoring

The water quality monitoring results and the graphical plots of the monitoring data are shown in **Appendix D**.

Exceedances of DO, SS and/or turbidity were observed. For MP3, five DO exceedances, one SS and one turbidity exceedance were recorded in February 2013. DO was exceeded on most monitoring dates in March 2013 and April 2013.

As for MP4 – MP6 located at the northern ditch of the site, the pH, DO, turbidity and SS have experienced different levels of exceedances throughout the monitoring period. One exceedance of pH was recorded in MP4 and MP6 in February 2013. DO was exceeded on several monitoring dates at MP4, MP5 and MP6, while turbidity and/or SS were exceeded on two monitoring dates at MP4, three monitoring dates at MP5 and nine monitoring dates at MP6 during the reporting period.

2.4 Ecological Monitoring

2.4.1 Monitoring of Birds

Monitoring was undertaken following the survey methodology in the EM&A Manual. The Wetland Restoration Area (hereafter WRA) was also surveyed during the reporting period as the area became accessible and site formation works for WRA has been completed. A transect was followed in the bird surveys (see **Figure 2.1**).

All bird species of conservation importance and/or wetland dependent were identified and enumerated. Flying birds were not recorded unless they were foraging and associated with the habitat (such as swifts). Further, notable bird observations during other surveys were also recorded. A summary of survey data is provided in **Appendix E**.

Bird surveys were conducted on a weekly basis. A total of 20, 18 and 19 bird species of conservation importance and/or wetland-dependence were recorded in the survey area (excluding the WRA) in February 2013, March 2013 and April 2013 respectively. Within the WRA, 13, 14 and 14 bird species of conservation importance and/or wetland-dependence were recorded in February 2013, March 2013 and April 2013, including 2, 2 and 2 of the target species in each respective month.

Of all bird target species, two were recorded on-site (high count and mean of the two target species respectively) during regular survey within the WRA: Little Egret ((3, 1.4) in February 2013, (3, 0.6) in March 2013 and (2, 1.2) in April 2013)) and Chinese Pond Heron ((1, 0.4) in February 2013 and no record in March 2013 and April 2013). Also, Chinese Pond Heron was observed in outside regular survey within the WRA during March 2013 and April 2013. The WRA continued to attract a number of species of conservation importance, including two Yellow Bittern, *Ixobrychus sinensis*, in April 2013.

Species and numbers recorded in this survey period are typical of fish pond areas in winter months.

The site continues to attract bird species of conservation importance, indicating that the WRA not only provides a buffer for potential disturbance during construction phase, it is also a valuable habitat for wetland dependent species and species of conservation importance.

2.4.2 Monitoring of Herpetofauna

Monitoring was undertaken following the survey methodology in the EM&A Manual. No herpetofauna surveys were scheduled in February 2013 and March 2013. No amphibian species or reptile species were recorded in other surveys in February 2013 and March 2013.

Monitoring of herpetofauna resumed in April 2013. One night time herpetofauna survey was conducted in the reporting month. No herpetofauna were recorded in the Survey Area (excluding the WRA) nor the WRA.

A summary of the survey findings is provided in **Appendix E**.

2.4.3 Monitoring of Dragonfly and Butterfly

No Odonates and Butterflies surveys were conducted in the February 2013.

Monitoring of dragonflies and butterflies was resumed in March 2013 and one survey was conducted according to the EM&A Manual. One odonate species was recorded in the Survey Area (excluding the WRA) while one butterfly species was recorded. Within the WRA, a total of two odonate species were recorded, while two butterfly species were recorded.

In April 2013, monitoring of dragonflies and butterflies were conducted on a bi-weekly basis according to the EM&A manual. Three odonate species were recorded in the Survey Area (excluding the WRA) while three butterfly species were recorded. Within the WRA, a total of six odonate species were recorded, while five butterfly species were recorded.

A summary of the survey findings are provided in **Appendix E**.

2.4.4 Monitoring of Mammals

Monitoring of mammal was conducted concurrently with other surveys.

In February 2013, no mammal species was recorded in the Survey area (excluding the WRA) or the WRA during regular survey. Japanese pipistrelle, *Pipistrellus abramus,* was recorded outside regular survey within the WRA.

In March 2013, no mammal was recorded in the Survey area (excluding the WRA) or the WRA during regular survey. No mammals species were recorded in other surveys.

In April 2013, no mammal was recorded in the Survey Area (excluding the WRA) or the WRA during regular survey. No mammals species were recorded in other surveys.

A summary of the survey findings are provided in **Appendix E**.

2.4.5 Management Activities

2.4.5.1 Vegetation Management

In February 2013, March 2013 and April 2013, vegetation management activities undertaken at the site primarily involved watering of plants, tree pruning, weeding and grass cutting.

Removal of exotic vegetation in all cells was undertaken which was included but not limited to *Typha sp.*, *Ipomoes sp.*, *Pennisetum sp.*, *Mimosa sp.*and *Mikania sp.*

2.4.5.2 Wildlife Management

During the reporting period, removal of Golden Apple Snail was undertaken on an “as-seen” basis and all sighted red fire ant nests were treated with approved pesticide.

2.5 Landscape and Visual Monitoring

The audit was undertaken with references to the specific mitigation measures recommended in **Section 10.2** of the EM&A Manual and the audit results are summarized as below:

Table 2.1: Construction Audit Summary on Landscape and Visual

Area of Works	Items to be Monitored
Works Area	The boundaries of the works area have been established on site in accordance with the contract documents and approved plans (EP), and the limit of current heavy construction activity is now confined to within the site hoardings (North side of the site / access road) and the noise barriers (other sides of the site). Minor works such as horticultural maintenance of the planting and transplanted trees, and boundary repair was proceeding along the Royal Palms - Palm Springs boundary. No construction works were observed to have exceeded the site boundaries. No construction was carried out at the wetland restoration area after 15 November 2010.

Protection of all trees and woodland blocks to be retained	Trees retained within the site along the northeast boundary, beside wetland restoration area, have been identified and protected by temporary protective fencing.
Streams	The works site is encircled by a berm / perimeter channel to intercept surface water and prevent it from washing off into any of the neighboring sites. Surface water is collected within the site in a temporary drainage channel. Gravels beds and barriers have been installed to filter site runoff, sedimentation ponds have been provided to enable primary treatment before discharge to mains drains.
Clearance of existing vegetation	Site clearance was completed prior to the commencement of construction.
Transplanting of trees	Tree transplanting has been completed, with the trees relocated to various points within the planting strip along the southern boundary of the site, outside the noise barrier. The trees continue to re-establish well.
Topsoil stripping	Suitable pond bund and soil material which had been excavated and stockpiled from the original site, has now been re-used within the landscape works Dust suppression measures are active along all internal site access tracks.
New buildings	No new permanent buildings have yet been constructed on site.
Boundaries	Hoardings have been erected along most of the boundaries of the site. Installation of new screen fence between the future residential sites and the constructed wetland restoration areas is complete. Fence has been painted green to match with the surrounding vegetated environment.
Noise Barrier	Noise barriers have been installed along the southern and western boundaries of the site in accordance with the contract requirements. Their design complies with the mitigation requirements, with upper 6 to 7m portion of the barrier being made from a translucent material with green tinted (to match with the environment). Supporting GMS structure, likewise, has been painted green.
Night-time lighting	No night-time works were reported to have been carried out during the monitoring period.
Landscape and wetland treatments	Continuous belt of screen planting along the southern and western boundaries of the site has been completed. The formation, soiling and water control structures of the wetland restoration area have been completed. The wetland areas are being established, with the ponds are being seasonally filled with rain water. Planting of areas around the WRA cells is complete. No construction was carried out at the wetland restoration area after 15 November 2010.
Soiling	The soiling for the advance planting strip has been completed. The soil placement and grading for each of the wetland restoration areas has been completed.
Plant supply	The plant material used in the Advance Planting Strip and in the WRA are all commonly available species and came from commercial sources. Transplanted reeds (*Phragmites australis*) at the wetland habitat came from the temporary holding nursery onsite.

Planting	The total number of trees that will reach a minimum of 10m in the advance planting strip meets the contract requirements. The tree species are all from the approved list. This planting should achieve the required screening effect within the required time period. Some of the trees that were identified as dead in previous reporting period or having defects (i.e. extensive bark damage, cavities, fungal growths etc) still need to be replaced with new specimens. Some of the recently planted trees are still in poor condition, but are showing small signs of graduate improvement. Seedling trees and shrubs, have been established at the margins of the wetland cells. Some additional fill-in planting has been undertaken.
Establishment Works	The advance planting, the compensatory planting and the transplanted trees are generally being maintained by the landscape sub-contractor in accordance with the specification to ensure that the contract requirements are met. Some of the taller trees (*Eucalyptus sp.)* that had been partially blown over, or are growing into the noise barrier structure, have been set upright and supported with rope cables and bamboo stalks. Some trees still need to be rectified before the typhoon season. Precautions should be taken to prevent damage to the trees by the structure. Low coverage of some areas of shrubs need to be rectified with further infill shrubs planting. Minor areas of shrubs have been cleared and these need to be replaced. Pruning of tall shrubs (i.e. *Ligustrum sinensis*) needs to be undertaken. Removal of extensive growth of weeds and invasive climbers in the space behind screen noise barrier has been carried out, but clearance needs to be undertaken on a monthly basis as they may be inhibiting the advance planting. Phragmites australis reeds have been partially cleared but are still growing profusely and need active management. Regular horticultural maintenance (grass cutting, weeding, watering etc.) in the shrubs and tree seedling areas around the WRA cells is being undertaken. The trees / shrubs planted along the northern site boundary are recovering from the previous insect infestation after the application of a pesticide. Growth of shrubs / seedlings on the north side of WRA1 is still unsatisfactory. Trees from outside the site which fell on top of trees in the advance planting strip, have been removed but no rectification of affected trees has been undertaken. Trees (T21 and T364) lost their leader and are no longer viable, so should be removed and replaced. Branches broken on trees have been pruned away. Workmanship of some pruning works did not comply with proper arboricultural practice resulting in bark tearing. T400 has been replaced with juvenile specimen which is unlikely to meet EP size requirements. Profuse fungal growth was noted on trunk of T292. Tree is irreparably damaged / rotten and should be removed immediately.

	Broken branch noted on tree behind the newly planted shrubs near WRA cell 4. Hanging branch on T266 and should be removed immediately, likewise T20 and T419. Excessive sap flow due to a tight wire on the trunk of T142. Tree ties and tags should be re-set to avoid strangling the trees. Severe bark damage on lower trunk of T333.

3. Environmental Site Inspection and Audit

3.1 Site Inspection

The ET carried out construction phase weekly site inspections on 5, 14, 19 and 25 February 2013, 5, 12, 19 and 28 March 2013 and 2, 9, 16, 23 and 29 April 2013 . All observations have been recorded in the site inspection checklist and passed to the Contractor together with the appropriate recommended mitigation measures where necessary.

3.2 Solid and Liquid Waste Management Status

The Contractor has been registered as a chemical waste producer for the Project. Construction and demolition (C&D) material sorting was carried out on site. A sufficient number of receptacles were available for general refuse collection.

As advised by the Contractor, 381 tonnes of C&D material were generated on site during the period. 14 kg of metals were generated and collected by registered recycling collector. 5 kg of paper cardboard packing and plastic were generated on site and collected by registered recycling collector. No chemical waste was generated and collected by licensed chemical waste collector. 354 kg of other types of wastes (e.g. general refuse) was generated on site and disposed of at public landfill facility.

The Contractor is advised to maintain on site waste sorting and recording system and maximize reuse/recycling of C&D wastes.

4. Report on Non-compliance and Complaints

4.1 Record on Non-compliance of Action and Limit Levels

4.1.1 Record of Non-compliance

There is no breach of Action or Limit Levels for Air Quality and Noise monitoring in the reporting period.

Exceedances of Action and Limit Levels were recorded for Water Quality at MP3, MP4, MP5 and MP6 on different monitoring dates.

Exceedances of DO, SS and/or turbidity were observed. For MP3, five DO exceedances, one SS and one turbidity exceedance were recorded in February 2013. DO was exceeded on most monitoring dates in March 2013 and April 2013.

As for MP4 – MP6 locating at the northern ditch of the site, the pH, DO, turbidity and SS have experienced different levels of exceedances throughout the monitoring period. One exceedance of pH was recorded in MP4 and MP6 in February 2013. DO was exceeded on several monitoring dates at MP4, MP5 and MP6, while turbidity and/or SS were exceeded on two monitoring dates at MP4, three monitoring dates at MP5 and on nine monitoring dates at MP6 during the reporting period.

4.1.2 Constructional Impacts on Water Quality

In order to determine the constructional impacts on water quality, the suspended solids level, which is a good indicator of the quality of effluent from construction site, is selected for assessment. The average value of suspended solids (SS) for water quality monitoring stations (MP3 – MP6) during baseline monitoring and construction phase monitoring for the reporting period are listed in **Table 4.1** below.

Table 4.1: Comparison of monitoring data of Suspended Solids

Monitoring Stations	Average Levels of Suspended Solids (mg/L)		Within 130% of mean value of Baseline data?
	During Baseline Monitoring	During Construction Phase Monitoring for the reporting period	
MP3	49.5	26.5	Yes
MP4	36.9	26.4	Yes
MP5	47.7	29.8	Yes
MP6	54.1	24.3	Yes

The average levels of suspended solids during the reporting period were within 130% of the baseline values. Although there were exceedances of water quality parameters, the above statistics show that the water quality during the reporting period has not significantly worsened when compared with the baseline condition.

It was noted that during the reporting period, all the water quality parameters monitored have been influenced by the natural environment and other external factors and exceedances of criteria were resulted. The exceedances have been investigated and are described in the following section.

4.1.3 Exceedance Investigations

Water Quality

From investigation, the Contractor has implemented water quality mitigation measures as recommended in the EIA report, including the provision of temporary drainage facility and associated treatment facility. Sand bags are in place in the temporary drainage channel to enhance the desilting efficiency. The Contractor further enhanced the water quality mitigation measures by erecting several segments of rock bunds at the discharge outlet to avoid site runoff draining directly to the northern ditches.

The possible causes of exceedances have been investigated and reported to the IEC during construction phase monitoring. The exceedance investigations have also been included in the monthly EM&A reports and some of them are extracted and summarised in **Table 4.2**. The causes of some of the exceedances were unknown but all of them were considered not related to the project. For detail, please refer to the previous monthly EM&A reports.

Table 4.2: Summary of exceedance investigations

Descriptions of exceedances	Possible causes	Exceedance related to project?
Exceedances of DO and turbidity and SS at MP3	The exceedances may be due to the external factors such as fish movements or pond fish culture activities which were out of the control of project.	No, noting that the fish pond (MP3) was being separated from the construction site by the WRA since November 2010.
Exceedances of pH at MP4, MP5 and MP6 on the other days	The exceedance may have been caused by natural variations.	No, as the values were in similar range compared to other stations where exceedances were also observed.
Exceedances of turbidity and/or SS at MP4, MP5 and MP6 after the heavy rain on 27 Mar 2013, 5 Apr 2013	The heavy rain could have caused large amount of surface runoff from all sources in the vicinity of the ditch.	No, as it is believed that the rainstorm has significantly increased the turbulence and thus resulted in higher turbidity and SS inside the ditch water.
Exceedances of turbidity and/or SS at MP4, MP5 and MP6 on other days in Mar 2013 and Apr 2013.	No heavy rainfall was recorded, therefore the reasons were unknown.	No.
Exceedances of DO at MP4, MP5 and MP6 for most of Feb 2013, Mar 2013 and Apr 2013	DO exceedance could be due to external factors such as microbe growth.	No.

In summary, all of the exceedances were caused by external factors including natural variations, pond fish culture activities, fish movement, rainstorms and other unknown factors. Moreover, as noted by monitoring team during on-site sampling, no direct muddy water discharge was observed from the site. The exceedances were considered not due to construction works.

4.2 Record on Environmental Complaints Received

No compliant was record in this reporting period.

4.3 Follow-up Actions Taken

Although it is considered that the exceedances were not related to the Project, the Contractor was reminded to implement the water quality mitigation measures in accordance with the recommendations stated in 5.6.1 – 5.6.4 of the EIA Report respectively as far as practicable and regular spot check would be conducted on the nearby discharge by Contractor and inform ET for investigation.

The Contractor has further enhanced the water quality mitigation measures by erecting several segments of rock bunds at the discharge outlet to avoid site runoff draining directly to the northern ditches.

It was also advised that the operation condition of the Wastewater Treatment Facilities should be checked regularly to ensure proper functioning of the plant and good quality of effluent discharge.

5. Future Key Issues

5.1 Construction Works for the Coming Months

The major site works to be commissioned in the coming three months include:

- Site formation
- Foundation work
- Superstructure
- Pond drainage management (to lower the water level and remove unwanted species in the pond)

5.2 Key Issues for the Coming Months

Key issues to be considered in the coming three months include:

- Generation of dust from activities on-site during dry weather conditions;
- Noise impact from operating equipment and machinery on-site;
- Generation of site surface runoffs and wastewater from activities on-site and during wet weather conditions;
- Sorting, recycling, storage and disposal of general refuse and construction waste from activities on-site; and
- Management of chemicals and avoidance of oil spillage on-site and to the drainage.

5.3 Conclusions and Recommendations

5.3.1 Conclusions

The EM&A programme as recommended in the EM&A manual has been undertaken in the reporting period.

Monitoring of Air Quality, Noise, Water Quality, Ecology and Landscape and Visual impacts due to the Project was under way. In particular, the 1-hr TSP, 24-hr TSP, noise level (as L_{eq}) and water quality parameters (such as pH, DO and SS) under monitoring have been checked against established Action and Limit levels.

There was no breach of Action or Limit levels for Air Quality and Noise (as L_{eq}) in the reporting period.

Action and Limit Level exceedances of pH, DO, turbidity and SS were recorded at water quality monitoring stations. However, investigations into the exceedances concluded that these were not related to the Project and may have been due to external factors including natural variations, pond fish culture activities, fish movement, rainstorms and other unknown factors.

5.3.2 Recommendations

With considerations on the construction activities and environment, the following recommendations were provided:

Air Quality

- All stockpiles should be covered by tarpaulin or kept wet by water spraying;
- All vehicles should be washed to remove any dusty materials before leaving the construction sites;
- The portion of road leading the construction site that is within 30m of a designated vehicle entrance or exit should be kept clear of dusty materials;
- Sufficient water spraying should be provided at haul road to reduce dust emission; and
- Ensure proper functioning of the wheel wash facility.

Noise

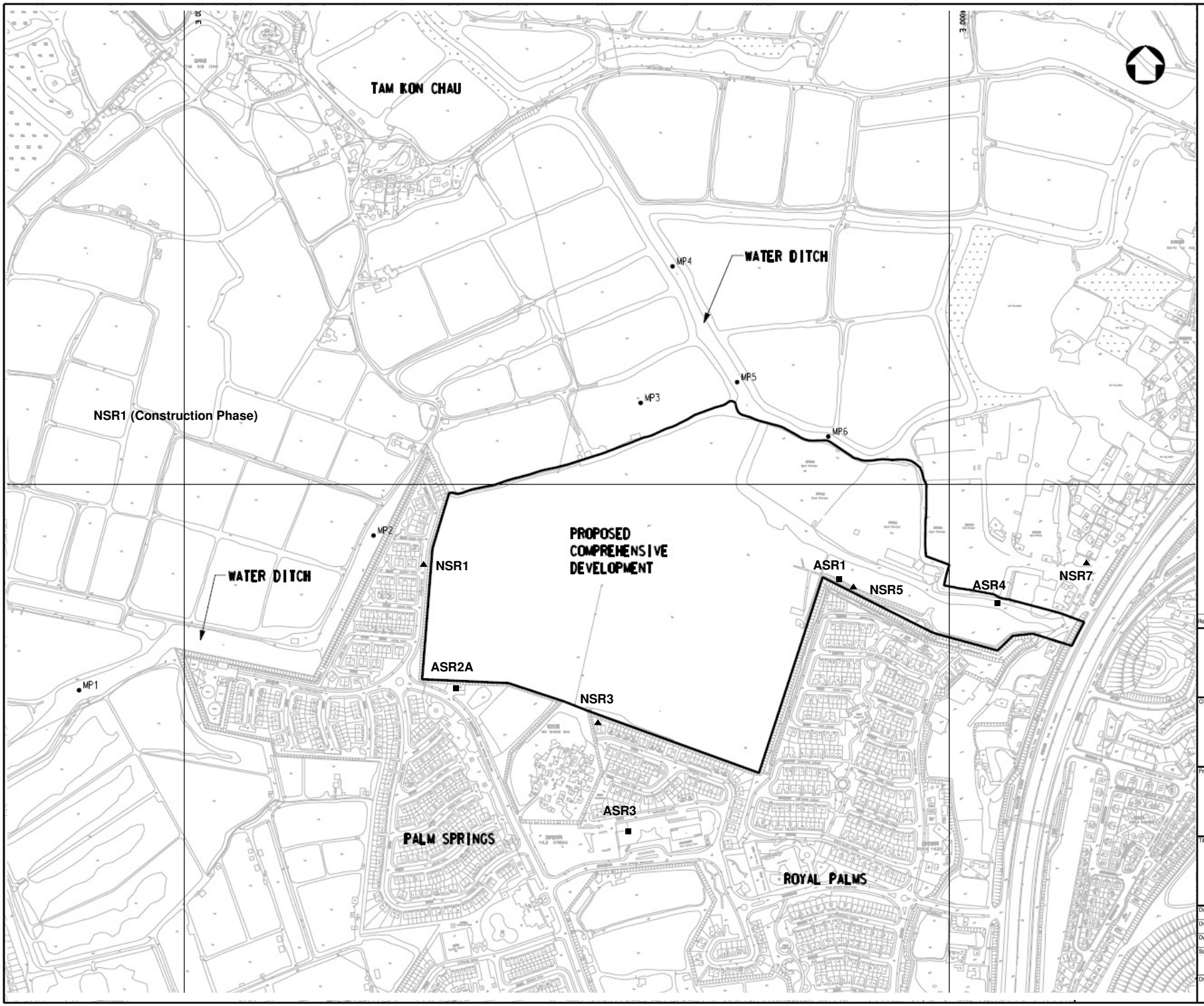
- Mobile plant should be sited as far away from NSRs as possible;
- Plant known to emit noise strongly in one direction should be orientated to direct noise away from the NSRs; and
- The construction activities should be better scheduled to reduce noise nuisance.

Water Quality

- Water accumulated in the site (including water inside drip trays) should be cleared frequently;
- Ensure proper functioning of the wastewater treatment facility; and
- Silt and debris should be removed from the temporary drainage channel regularly.

Waste Management

- Reuse the excavated materials as far as practical to reduce the amount of waste disposal;
- Ensure drip trays are provided for chemical containers to prevent leakage or soil contamination;
- All plants and vehicles should be properly maintained to prevent oil leakage; and
- Oil stains on soil should be cleared by disposal of contaminated soil.



Legends:

- ■ Air Quality Monitoring Stations
- ▲ Noise Monitoring Stations
- ● Water Quality Monitoring Stations
- ━ Site Boundary

Rev	Date	Drawn	Description	Ch'k'd	App'd

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Client

HENG SHUNG CONSTRUCTION CO. LTD

Project

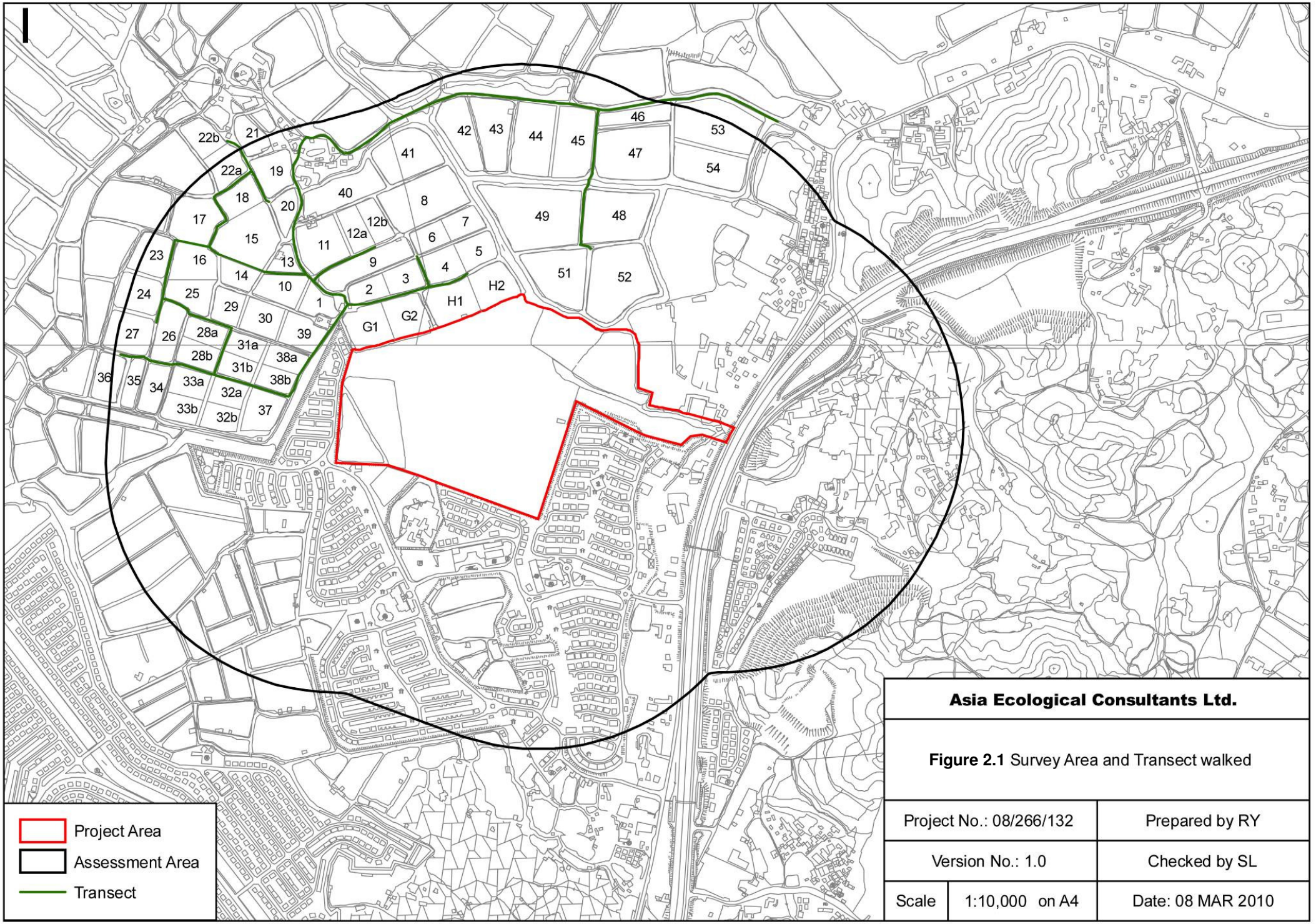
PROPOSED COMPREHENSIVE DEVELOPMENT AT WO SHANG WAI, YUEN LONG

Title

General Site Layout and Locations of Monitoring Stations

Designed		Eng.Chk.	
Drawn		Coordination	
Dwg.Chk.		Approved	
Scale	Project		Status
	CAD File J:\J2005\REPORT\ENV\EM&A_manual\060301\BaseMap.dgn		
Drawing No.			Rev

Figure 1.1

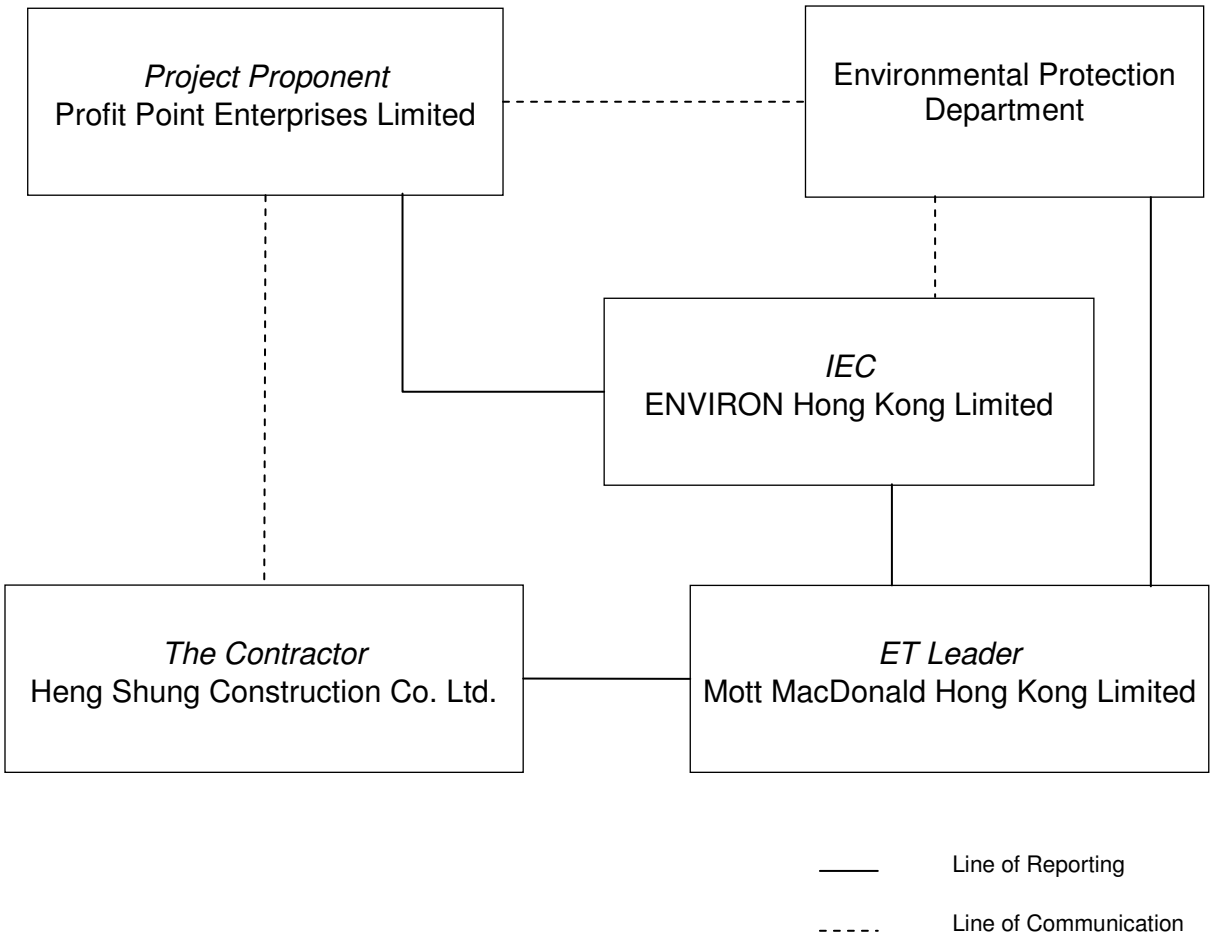


Asia Ecological Consultants Ltd.

Figure 2.1 Survey Area and Transect walked

Project No.: 08/266/132		Prepared by RY
Version No.: 1.0		Checked by SL
Scale	1:10,000 on A4	Date: 08 MAR 2010

Appendix A. Project Organization Chart



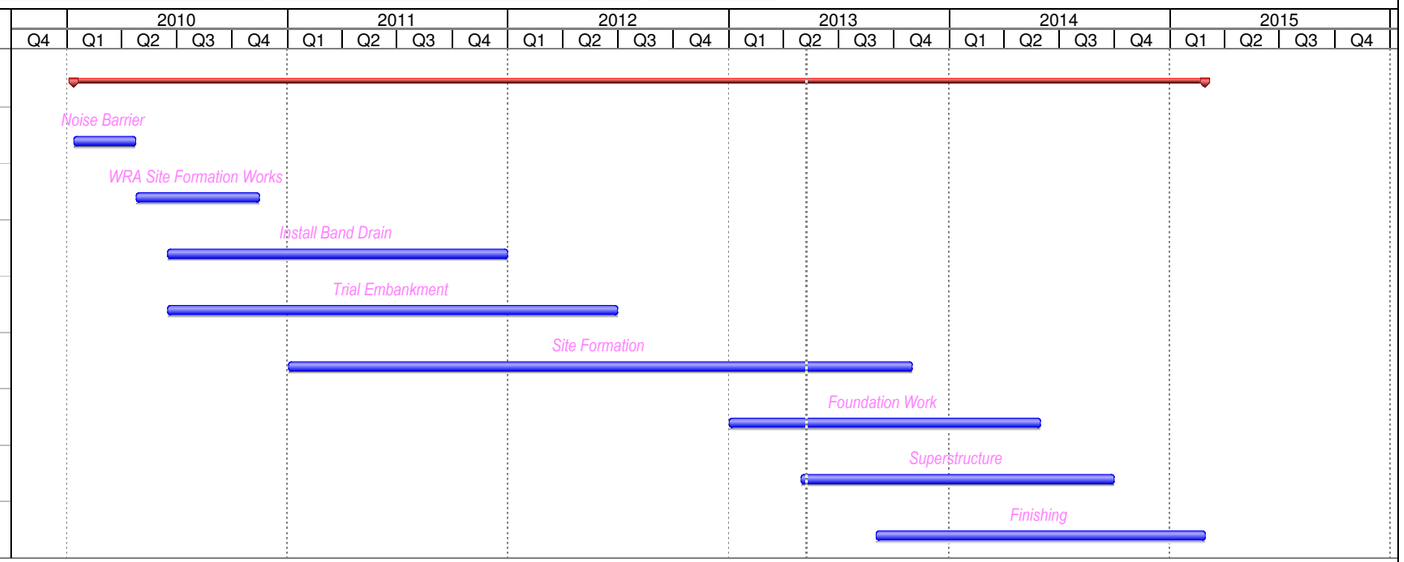
Contact information:

Company	Position	Name	Telephone
Profit Point Enterprises Limited (Project Proponent)	Project Manager	Mr. Kelvin LAU	2908 8114
Heng Shung Construction Co. Ltd. (The Contractor)	Assistant Construction Manager	Ms. Lynne HUNG	2908 2391
	Site Agent	Mr. POON Man Ho	9426 3533
	Environmental Officer	Mr. Ricky WONG	9866 7625
ENVIRON Hong Kong Ltd. (Independent Environmental Checker (IEC))	Independent Environmental Checker	Mr. David YEUNG	3743 0788
Mott MacDonald Hong Kong Ltd. (Environmental Team (ET))	Environmental Team Leader	Mr. Terence KONG	2828 5919

Appendix B. Tentative Construction Programme

Wo Shang Wai Construction Works Programme (Phase I) (except TOA)

ID	Task Name	Working	Start	Finish
0	**Wo Shang Wai Construction Phase**	**1556 days**	**Wed 13/01/10**	**Sat 28/02/15**
1	Noise Barrier	85 days	Wed 13/01/10	Sat 24/04/10
2	WRA Site Formation Works	168 days	Mon 26/04/10	Mon 15/11/10
3	Install Band Drain	456 days	Thu 17/06/10	Sat 31/12/11
4	Trial Embankment	600 days	Thu 17/06/10	Sat 30/06/12
5	Site Formation	849 days	Mon 03/01/11	Thu 31/10/13
6	Foundation Work	442 days	Wed 02/01/13	Sat 31/05/14
7	Superstructure	444 days	Wed 01/05/13	Tue 30/09/14
8	Finishing	468 days	Mon 02/09/13	Sat 28/02/15



Project : Wo Shang Wai
Revision : I
Print Date : Wed 08/05/13

Task Milestone Summary

Appendix C. Action and Limit Levels for Construction Phase

Air Quality

Action and Limit Levels for 24-hour TSP

Monitoring Station	Action Level (µg/m^3)	Limit Level (µg/m^3)
ASR1	226	260
ASR2A	213	260
ASR3	205	260
ASR4	237	260

Action and Limit Levels for 1-hour TSP

Monitoring Station	Action Level (µg/m^3)	Limit Level (µg/m^3)
ASR1	378	500
ASR2A	357	500
ASR3	358	500
ASR4	372	500

Noise

Action and Limit Levels for Construction Noise

Time Period	Action Level	Limit Level
NSR1, NSR3, NSR5, NSR7		
0700 – 1900 hours on normal weekdays	When one documented complaint is received from any one of the sensitive receivers	75 dB(A)

Water Quality

Action and Limit Levels for Water Quality

Parameters	DO in mg/L		Turbidity in NTU		SS in mg/L		pH	
	Action Level	Limit Level	Action Level	Action Level	Action Level	Limit Level	Action Level	Limit Level
MP1	1.23	1.17	173	177	231	299	< 5.5 or > 7.5	< 4.0 or > 8.0
MP2	1.04	0.89	132	163	170	209		
MP3	6.85	6.65	64	67	65	66		
MP4	3.91	3.82	60	64	50	53		
MP5	4.13	3.87	81	84	66	69		
MP6	4.61	4.52	94	96	75	75		

Appendix D. Summary and Graphical plots of the monitoring results

Air Quality (1-hr TSP)

Station ASR1

Date	Start Time	Finish Time	TSP Concentration ($\mu g/m^3$)	Weather Condition	Action Level ($\mu g/m^3$)	Limit Level ($\mu g/m^3$)
05-Feb-13	13:14	14:14	101	Cloudy	378	500
05-Feb-13	14:14	15:14	108	Cloudy	378	500
05-Feb-13	15:14	16:14	112	Cloudy	378	500
09-Feb-13	13:28	14:28	77	Fine	378	500
09-Feb-13	14:28	15:28	80	Fine	378	500
09-Feb-13	15:28	16:28	86	Fine	378	500
15-Feb-13	13:17	14:17	99	Cloudy	378	500
15-Feb-13	14:17	15:17	106	Cloudy	378	500
15-Feb-13	15:17	16:17	86	Cloudy	378	500
21-Feb-13	13:18	14:18	106	Fine	378	500
21-Feb-13	14:18	15:18	110	Fine	378	500
21-Feb-13	15:18	16:18	108	Fine	378	500
27-Feb-13	13:19	14:19	102	Fine	378	500
27-Feb-13	14:19	15:19	108	Fine	378	500
27-Feb-13	15:19	16:19	96	Fine	378	500
05-Mar-13	14:26	15:26	112	Fine	378	500
05-Mar-13	15:26	16:26	108	Fine	378	500
05-Mar-13	16:26	17:26	110	Fine	378	500
11-Mar-13	13:30	14:30	104	Fine	378	500
11-Mar-13	14:30	15:30	115	Fine	378	500
11-Mar-13	15:30	16:30	106	Fine	378	500
15-Mar-13	13:22	14:22	104	Fine	378	500
15-Mar-13	14:22	15:22	112	Fine	378	500
15-Mar-13	15:22	16:22	106	Fine	378	500
21-Mar-13	13:12	14:12	87	Cloudy	378	500
21-Mar-13	14:12	15:12	96	Cloudy	378	500
21-Mar-13	15:12	16:12	102	Cloudy	378	500
27-Mar-13	13:22	14:22	106	Cloudy	378	500
27-Mar-13	14:22	15:22	111	Cloudy	378	500
27-Mar-13	15:22	16:22	102	Cloudy	378	500
02-Apr-13	13:42	14:42	104	Cloudy	378	500
02-Apr-13	14:42	15:42	112	Cloudy	378	500
02-Apr-13	15:42	16:42	108	Cloudy	378	500
08-Apr-13	13:16	14:16	106	Cloudy	378	500
08-Apr-13	14:16	15:16	114	Cloudy	378	500
08-Apr-13	15:16	16:16	108	Cloudy	378	500
12-Apr-13	13:29	14:29	104	Cloudy	378	500
12-Apr-13	14:29	15:29	112	Cloudy	378	500
12-Apr-13	15:29	16:29	89	Cloudy	378	500
18-Apr-13	13:24	14:24	116	Cloudy	378	500
18-Apr-13	14:24	15:24	108	Cloudy	378	500
18-Apr-13	15:24	16:24	120	Cloudy	378	500
24-Apr-13	13:15	14:15	104	Fine	378	500
24-Apr-13	14:15	15:15	112	Fine	378	500
24-Apr-13	15:15	16:15	96	Fine	378	500
30-Apr-13	13:58	14:58	112	Cloudy	378	500
30-Apr-13	14:58	15:58	106	Cloudy	378	500
30-Apr-13	15:58	16:58	122	Cloudy	378	500
		Min.	77	} for		
		Max.	122	} reporting		
		Average	105	} period		

Air Quality (1-hr TSP)

Station ASR2A

Date	Start Time	Finish Time	TSP Concentration (μg/m^3)	Weather Condition	Action Level (μg/m^3)	Limit Level (μg/m^3)
05-Feb-13	12:49	13:49	102	Cloudy	357	500
05-Feb-13	13:49	14:49	114	Cloudy	357	500
05-Feb-13	14:49	15:49	110	Cloudy	357	500
09-Feb-13	12:56	13:56	78	Fine	357	500
09-Feb-13	13:56	14:56	82	Fine	357	500
09-Feb-13	14:56	15:56	88	Fine	357	500
15-Feb-13	12:49	13:49	102	Cloudy	357	500
15-Feb-13	13:49	14:49	106	Cloudy	357	500
15-Feb-13	14:49	15:49	98	Cloudy	357	500
21-Feb-13	12:55	13:55	112	Fine	357	500
21-Feb-13	13:55	14:55	104	Fine	357	500
21-Feb-13	14:55	15:55	109	Fine	357	500
27-Feb-13	12:49	13:49	102	Fine	357	500
27-Feb-13	13:49	14:49	110	Fine	357	500
27-Feb-13	14:49	15:49	98	Fine	357	500
05-Mar-13	13:17	14:17	110	Fine	357	500
05-Mar-13	14:17	15:17	106	Fine	357	500
05-Mar-13	15:17	16:17	102	Fine	357	500
11-Mar-13	12:49	13:49	114	Fine	357	500
11-Mar-13	13:49	14:49	118	Fine	357	500
11-Mar-13	14:49	15:49	106	Fine	357	500
15-Mar-13	12:51	13:51	98	Fine	357	500
15-Mar-13	13:51	14:51	107	Fine	357	500
15-Mar-13	14:51	15:51	101	Fine	357	500
21-Mar-13	12:47	13:47	98	Cloudy	357	500
21-Mar-13	13:47	14:47	100	Cloudy	357	500
21-Mar-13	14:47	15:47	112	Cloudy	357	500
27-Mar-13	12:50	13:50	112	Cloudy	357	500
27-Mar-13	13:50	14:50	104	Cloudy	357	500
27-Mar-13	14:50	15:50	108	Cloudy	357	500
02-Apr-13	12:52	13:52	114	Cloudy	357	500
02-Apr-13	13:52	14:52	102	Cloudy	357	500
02-Apr-13	14:52	15:52	117	Cloudy	357	500
08-Apr-13	12:48	13:48	113	Cloudy	357	500
08-Apr-13	13:48	14:48	98	Cloudy	357	500
08-Apr-13	14:48	15:48	104	Cloudy	357	500
12-Apr-13	12:49	13:49	94	Cloudy	357	500
12-Apr-13	13:49	14:49	102	Cloudy	357	500
12-Apr-13	14:49	15:49	111	Cloudy	357	500
18-Apr-13	12:51	13:51	116	Cloudy	357	500
18-Apr-13	13:51	14:51	122	Cloudy	357	500
18-Apr-13	14:51	15:51	105	Cloudy	357	500
24-Apr-13	12:48	13:48	96	Fine	357	500
24-Apr-13	13:48	14:48	104	Fine	357	500
24-Apr-13	14:48	15:48	113	Fine	357	500
30-Apr-13	12:34	13:34	104	Cloudy	357	500
30-Apr-13	13:34	14:34	98	Cloudy	357	500
30-Apr-13	14:34	15:34	113	Cloudy	357	500
		Min.	78	} for		
		Max.	122	} reporting		
		Average	105	} period		

Air Quality (1-hr TSP)

Station ASR3

Date	Start Time	Finish Time	TSP Concentration (μg/m^3)	Weather Condition	Action Level (μg/m^3)	Limit Level (μg/m^3)
05-Feb-13	12:33	13:33	102	Cloudy	358	500
05-Feb-13	13:33	14:33	114	Cloudy	358	500
05-Feb-13	14:33	15:33	108	Cloudy	358	500
09-Feb-13	12:34	13:34	72	Fine	358	500
09-Feb-13	13:34	14:34	84	Fine	358	500
09-Feb-13	14:34	15:34	80	Fine	358	500
15-Feb-13	12:36	13:36	98	Cloudy	358	500
15-Feb-13	13:36	14:36	102	Cloudy	358	500
15-Feb-13	14:36	15:36	106	Cloudy	358	500
21-Feb-13	12:41	13:41	106	Fine	358	500
21-Feb-13	13:41	14:41	112	Fine	358	500
21-Feb-13	14:41	15:41	118	Fine	358	500
27-Feb-13	12:35	13:35	99	Fine	358	500
27-Feb-13	13:35	14:35	102	Fine	358	500
27-Feb-13	14:35	15:35	108	Fine	358	500
05-Mar-13	12:53	13:53	102	Fine	358	500
05-Mar-13	13:53	14:53	112	Fine	358	500
05-Mar-13	14:53	15:53	96	Fine	358	500
11-Mar-13	12:36	13:36	104	Fine	358	500
11-Mar-13	13:36	14:36	115	Fine	358	500
11-Mar-13	14:36	15:36	118	Fine	358	500
15-Mar-13	12:33	13:33	106	Fine	358	500
15-Mar-13	13:33	14:33	97	Fine	358	500
15-Mar-13	14:33	15:33	104	Fine	358	500
21-Mar-13	12:33	13:33	104	Cloudy	358	500
21-Mar-13	13:33	14:33	112	Cloudy	358	500
21-Mar-13	14:33	15:33	106	Cloudy	358	500
27-Mar-13	12:33	13:33	102	Cloudy	358	500
27-Mar-13	13:33	14:33	113	Cloudy	358	500
27-Mar-13	14:33	15:33	98	Cloudy	358	500
02-Apr-13	12:36	13:36	96	Cloudy	358	500
02-Apr-13	13:36	14:36	104	Cloudy	358	500
02-Apr-13	14:36	15:36	108	Cloudy	358	500
08-Apr-13	12:33	13:33	96	Cloudy	358	500
08-Apr-13	13:33	14:33	104	Cloudy	358	500
08-Apr-13	14:33	15:33	112	Cloudy	358	500
12-Apr-13	12:35	13:35	112	Cloudy	358	500
12-Apr-13	13:35	14:35	98	Cloudy	358	500
12-Apr-13	14:35	15:35	104	Cloudy	358	500
18-Apr-13	12:34	13:34	126	Cloudy	358	500
18-Apr-13	13:34	14:34	104	Cloudy	358	500
18-Apr-13	14:34	15:34	119	Cloudy	358	500
24-Apr-13	12:34	13:34	104	Fine	358	500
24-Apr-13	13:34	14:34	112	Fine	358	500
24-Apr-13	14:34	15:34	98	Fine	358	500
30-Apr-13	12:19	13:19	104	Cloudy	358	500
30-Apr-13	13:19	14:19	112	Cloudy	358	500
30-Apr-13	14:19	15:19	96	Cloudy	358	500
		Min.	72	} for		
		Max.	126	} reporting		
		Average	104	} period		

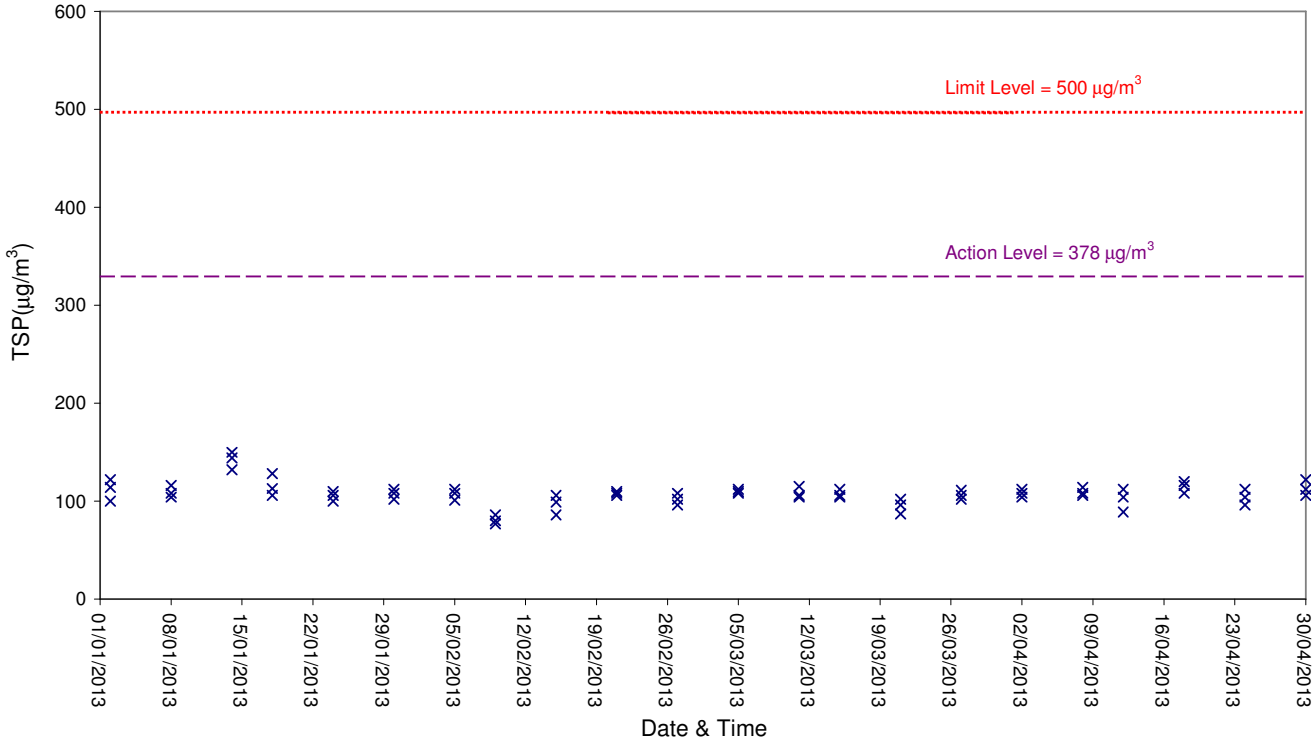
Air Quality (1-hr TSP)

Station ASR4

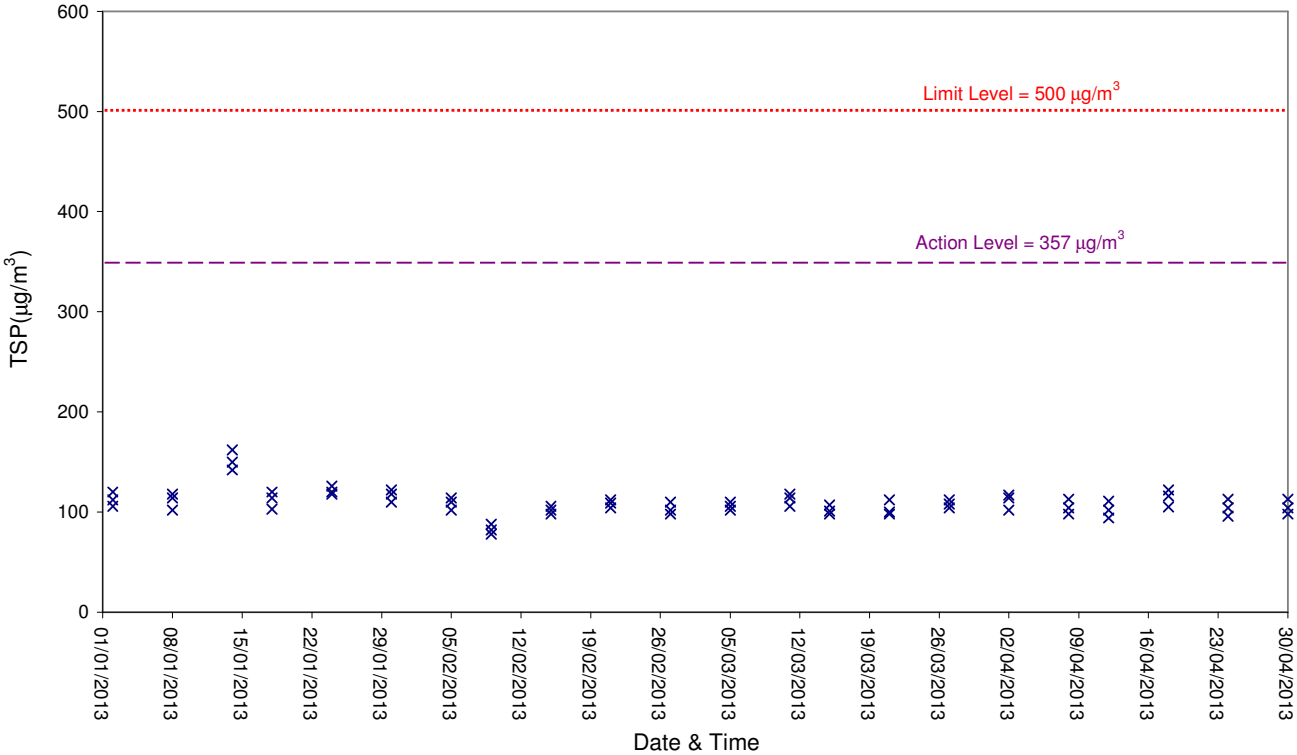
Date	Start Time	Finish Time	TSP Concentration (μg/m^3)	Weather Condition	Action Level (μg/m^3)	Limit Level (μg/m^3)
05-Feb-13	13:09	14:09	122	Cloudy	372	500
05-Feb-13	14:09	15:09	109	Cloudy	372	500
05-Feb-13	15:09	16:09	118	Cloudy	372	500
09-Feb-13	13:14	14:14	82	Fine	372	500
09-Feb-13	14:14	15:14	88	Fine	372	500
09-Feb-13	15:14	16:14	94	Fine	372	500
15-Feb-13	13:09	14:09	118	Cloudy	372	500
15-Feb-13	14:09	15:09	106	Cloudy	372	500
15-Feb-13	15:09	16:09	114	Cloudy	372	500
21-Feb-13	13:08	14:08	112	Fine	372	500
21-Feb-13	14:08	15:08	120	Fine	372	500
21-Feb-13	15:08	16:08	118	Fine	372	500
27-Feb-13	13:12	14:12	118	Fine	372	500
27-Feb-13	14:12	15:12	120	Fine	372	500
27-Feb-13	15:12	16:12	114	Fine	372	500
05-Mar-13	13:52	14:52	122	Fine	372	500
05-Mar-13	14:52	15:52	126	Fine	372	500
05-Mar-13	15:52	16:52	114	Fine	372	500
11-Mar-13	13:08	14:08	122	Fine	372	500
11-Mar-13	14:08	15:08	114	Fine	372	500
11-Mar-13	15:08	16:08	108	Fine	372	500
15-Mar-13	13:10	14:10	122	Fine	372	500
15-Mar-13	14:10	15:10	118	Fine	372	500
15-Mar-13	15:10	16:10	112	Fine	372	500
21-Mar-13	13:07	14:07	125	Cloudy	372	500
21-Mar-13	14:07	15:07	118	Cloudy	372	500
21-Mar-13	15:07	16:07	108	Cloudy	372	500
27-Mar-13	13:15	14:15	122	Cloudy	372	500
27-Mar-13	14:15	15:15	114	Cloudy	372	500
27-Mar-13	15:15	16:15	105	Cloudy	372	500
02-Apr-13	13:35	14:35	120	Cloudy	372	500
02-Apr-13	14:35	15:35	113	Cloudy	372	500
02-Apr-13	15:35	16:35	116	Cloudy	372	500
08-Apr-13	13:04	14:04	112	Cloudy	372	500
08-Apr-13	14:04	15:04	120	Cloudy	372	500
08-Apr-13	15:04	16:04	108	Cloudy	372	500
12-Apr-13	13:09	14:09	122	Cloudy	372	500
12-Apr-13	14:09	15:09	118	Cloudy	372	500
12-Apr-13	15:09	16:09	108	Cloudy	372	500
18-Apr-13	13:16	14:16	133	Cloudy	372	500
18-Apr-13	14:16	15:16	128	Cloudy	372	500
18-Apr-13	15:16	16:16	120	Cloudy	372	500
24-Apr-13	13:06	14:06	128	Fine	372	500
24-Apr-13	14:06	15:06	116	Fine	372	500
24-Apr-13	15:06	16:06	107	Fine	372	500
30-Apr-13	13:37	14:37	122	Cloudy	372	500
30-Apr-13	14:37	15:37	134	Cloudy	372	500
30-Apr-13	15:37	16:37	116	Cloudy	372	500
		Min.	82	} for		
		Max.	134	} reporting		
		Average	116	} period		

Air Quality

1-hour TSP Level at ASR1

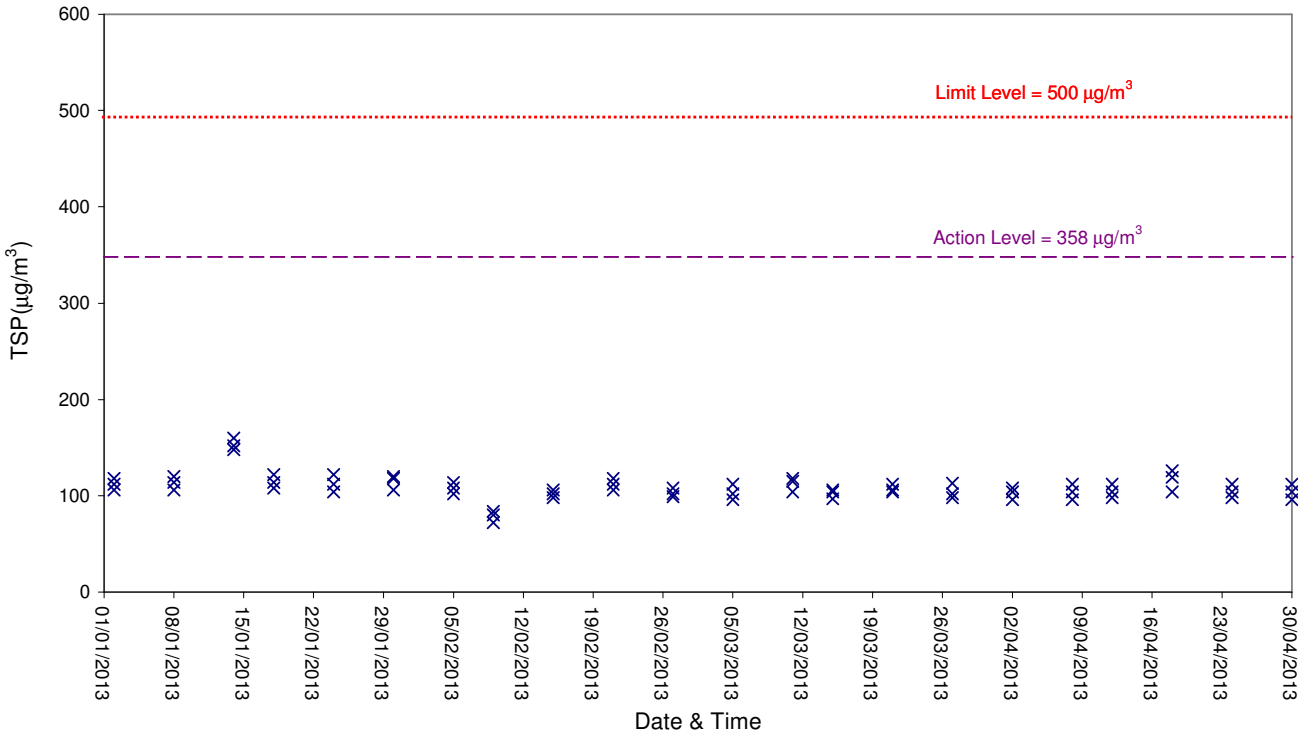


1-hour TSP Level at ASR2A

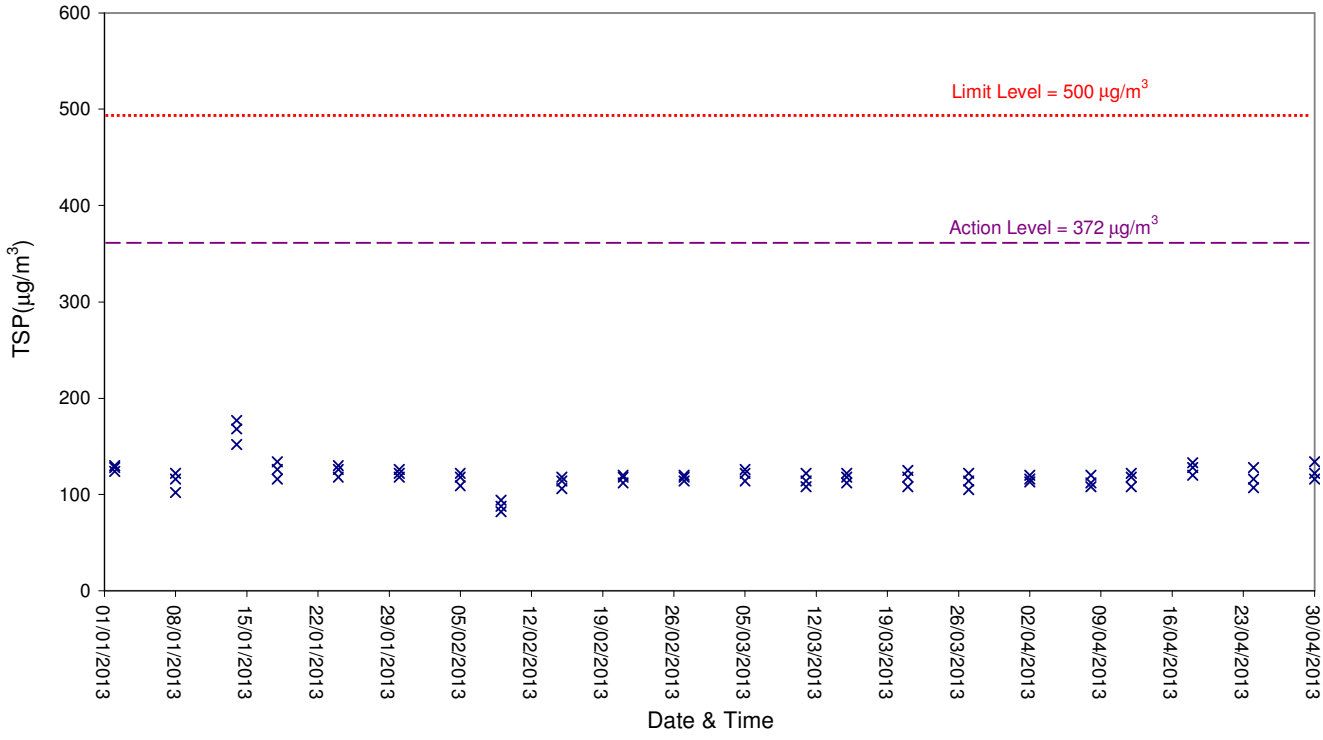


Air Quality

1-hour TSP Level at ASR3



1-hour TSP Level at ASR4



Air Quality (24-hr TSP)

Station ASR1

Start		Finish		Filter Weight (g)		Elapsed Time Reading		Sampling Time (hrs)	Flow Rate (m^3/min)			Conc. ($\mu g/m^3$)	Weather Condition	Action Level	Limit Level
Date	Time	Date	Time	Initial	Final	Initial	Final		Initial	Final	Average				
05-Feb-13	13:53	06-Feb-13	13:53	2.8121	2.9811	14030.69	14054.69	24.00	1.3000	1.3000	1.3000	90	Cloudy	226	260
09-Feb-13	13:25	10-Feb-13	13:25	2.8009	2.9521	14054.69	14078.69	24.00	1.3000	1.3000	1.3000	81	Fine	226	260
15-Feb-13	13:56	16-Feb-13	13:56	2.8155	2.9661	14078.69	14102.69	24.00	1.3000	1.3000	1.3000	80	Cloudy	226	260
21-Feb-13	13:54	22-Feb-13	13:54	2.7917	3.0051	14102.69	14126.69	24.00	1.3000	1.3000	1.3000	114	Fine	226	260
27-Feb-13	13:55	28-Feb-13	13:55	2.8097	2.9809	14126.69	14150.69	24.00	1.3000	1.3000	1.3000	91	Fine	226	260
05-Mar-13	15:05	06-Mar-13	15:05	2.8041	2.9706	14150.69	14174.69	24.00	1.2600	1.2600	1.2600	92	Fine	226	260
11-Mar-13	14:10	12-Mar-13	14:10	2.8206	2.9955	14174.69	14198.69	24.00	1.2600	1.2600	1.2600	96	Fine	226	260
15-Mar-13	13:18	16-Mar-13	13:18	2.8177	2.9597	14198.69	14222.69	24.00	1.2600	1.2600	1.2600	78	Fine	226	260
21-Mar-13	13:50	22-Mar-13	13:50	2.8091	2.9711	14222.69	14246.69	24.00	1.2600	1.2600	1.2600	89	Cloudy	226	260
27-Mar-13	14:13	28-Mar-13	14:13	2.8219	2.9919	14246.69	14270.69	24.00	1.2600	1.2600	1.2600	94	Cloudy	226	260
02-Apr-13	14:22	03-Apr-13	14:22	2.8235	2.9771	14270.69	14294.69	24.00	1.2600	1.2600	1.2600	85	Cloudy	226	260
08-Apr-13	13:52	09-Apr-13	13:52	2.8177	2.9788	14294.69	14318.69	24.00	1.2600	1.2600	1.2600	89	Cloudy	226	260
12-Apr-13	13:25	13-Apr-13	13:25	2.8098	2.9676	14318.69	14342.69	24.00	1.2600	1.2600	1.2600	87	Cloudy	226	260
18-Apr-13	14:00	19-Apr-13	14:00	2.8098	2.9842	14342.69	14366.69	24.00	1.2600	1.2600	1.2600	96	Cloudy	226	260
24-Apr-13	13:53	25-Apr-13	13:53	2.8224	2.9669	14366.69	14390.69	24.00	1.2600	1.2600	1.2600	80	Fine	226	260
30-Apr-13	14:35	01-May-13	14:35	2.8173	2.9770	14390.69	14414.69	24.00	1.2600	1.2600	1.2600	88	Cloudy	226	260
											Min	78	} for		
											Max	114	} reporting		
											Average	89	} period		

Air Quality (24-hr TSP)

Station ASR2A

Start		Finish		Filter Weight (g)		Elapsed Time Reading		Sampling Time (hrs)	Flow Rate (m^3/min)			Conc. (µg/m^3)	Weather Condition	Action Level	Limit Level
Date	Time	Date	Time	Initial	Final	Initial	Final		Initial	Final	Average				
05-Feb-13	12:46	06-Feb-13	12:46	2.7914	2.9522	17494.54	17518.54	24.00	1.2400	1.2400	1.2400	90	Cloudy	213	260
09-Feb-13	12:45	10-Feb-13	12:45	2.8115	2.9606	17518.54	17542.54	24.00	1.2400	1.2400	1.2400	84	Fine	213	260
15-Feb-13	12:46	16-Feb-13	12:46	2.8190	2.9501	17542.54	17566.54	24.00	1.2400	1.2400	1.2400	73	Cloudy	213	260
21-Feb-13	12:51	22-Feb-13	12:51	2.8234	2.9851	17566.54	17590.54	24.00	1.2400	1.2400	1.2400	91	Fine	213	260
27-Feb-13	12:45	28-Feb-13	12:45	2.8075	2.9746	17590.54	17614.54	24.00	1.2400	1.2400	1.2400	94	Fine	213	260
05-Mar-13	13:13	06-Mar-13	13:13	2.8144	2.9906	17614.54	17638.54	24.00	1.3200	1.3200	1.3200	93	Fine	213	260
11-Mar-13	12:45	12-Mar-13	12:45	2.8059	2.9871	17638.54	17662.54	24.00	1.3200	1.3200	1.3200	95	Fine	213	260
15-Mar-13	12:46	16-Mar-13	12:46	2.8121	2.9677	17662.54	17686.54	24.00	1.3200	1.3200	1.3200	82	Fine	213	260
21-Mar-13	12:43	22-Mar-13	12:43	2.8099	2.9631	17686.54	17710.54	24.00	1.3200	1.3200	1.3200	81	Cloudy	213	260
27-Mar-13	12:46	28-Mar-13	12:46	2.8276	2.9867	17710.54	17734.54	24.00	1.3200	1.3200	1.3200	84	Cloudy	213	260
02-Apr-13	12:48	03-Apr-13	12:48	2.8125	2.9788	17734.54	17758.54	24.00	1.3200	1.3200	1.3200	87	Cloudy	213	260
08-Apr-13	12:43	09-Apr-13	12:43	2.8093	2.9611	17758.54	17782.54	24.00	1.3200	1.3200	1.3200	80	Cloudy	213	260
12-Apr-13	12:46	13-Apr-13	12:46	2.8119	2.9821	17782.54	17806.54	24.00	1.3200	1.3200	1.3200	90	Cloudy	213	260
18-Apr-13	12:46	19-Apr-13	12:46	2.8195	2.9789	17806.54	17830.54	24.00	1.3200	1.3200	1.3200	84	Cloudy	213	260
24-Apr-13	12:44	25-Apr-13	12:44	2.8209	2.9898	17830.54	17854.54	24.00	1.3200	1.3200	1.3200	89	Fine	213	260
30-Apr-13	12:30	01-May-13	12:30	2.6871	2.8700	17854.54	17878.54	24.00	1.3200	1.3200	1.3200	96	Cloudy	213	260
											Min	73	} for		
											Max	96	} reporting		
											Average	87	} period		

Air Quality (24-hr TSP)

Station ASR3

Start		Finish		Filter Weight (g)		Elapsed Time Reading		Sampling Time (hrs)	Flow Rate (m3/min)			Conc. ($\mu g/m^3$)	Weather Condition	Action Level	Limit Level
Date	Time	Date	Time	Initial	Final	Initial	Final		Initial	Final	Average				
05-Feb-13	12:30	06-Feb-13	12:30	2.7987	2.9581	7716.69	7740.69	24.00	1.3000	1.3000	1.3000	85	Cloudy	205	260
09-Feb-13	12:33	10-Feb-13	12:33	2.8141	2.9642	7740.69	7764.69	24.00	1.3000	1.3000	1.3000	80	Fine	205	260
15-Feb-13	12:33	16-Feb-13	12:33	2.8031	2.9714	7764.69	7788.69	24.00	1.3000	1.3000	1.3000	90	Cloudy	205	260
21-Feb-13	12:38	22-Feb-13	12:38	2.8159	3.0110	7788.69	7812.69	24.00	1.3000	1.3000	1.3000	104	Fine	205	260
27-Feb-13	12:32	28-Feb-13	12:32	2.8114	2.9900	7812.69	7836.69	24.00	1.3000	1.3000	1.3000	95	Fine	205	260
05-Mar-13	12:50	06-Mar-13	12:50	2.8094	2.9811	7836.69	7860.69	24.00	1.2200	1.2200	1.2200	98	Fine	205	260
11-Mar-13	12:30	12-Mar-13	12:30	2.8115	2.9865	7860.69	7884.69	24.00	1.2200	1.2200	1.2200	100	Fine	205	260
15-Mar-13	12:30	16-Mar-13	12:30	2.8249	2.9699	7884.69	7908.69	24.00	1.2200	1.2200	1.2200	83	Fine	205	260
21-Mar-13	12:30	22-Mar-13	12:30	2.8124	2.9744	7908.69	7932.69	24.00	1.2200	1.2200	1.2200	92	Cloudy	205	260
27-Mar-13	12:30	28-Mar-13	12:30	2.8300	2.9917	7932.69	7956.69	24.00	1.2200	1.2200	1.2200	92	Cloudy	205	260
02-Apr-13	12:30	03-Apr-13	12:30	2.8298	2.9904	7956.69	7980.69	24.00	1.2200	1.2200	1.2200	91	Cloudy	205	260
08-Apr-13	12:30	09-Apr-13	12:30	2.8169	2.9615	7980.69	8004.69	24.00	1.2200	1.2200	1.2200	82	Cloudy	205	260
12-Apr-13	12:30	13-Apr-13	12:30	2.8142	2.9771	8004.69	8028.69	24.00	1.2200	1.2200	1.2200	93	Cloudy	205	260
18-Apr-13	12:30	19-Apr-13	12:30	2.8117	2.9667	8028.69	8052.69	24.00	1.2200	1.2200	1.2200	88	Cloudy	205	260
24-Apr-13	12:30	25-Apr-13	12:30	2.8159	2.9771	8052.69	8076.69	24.00	1.2200	1.2200	1.2200	92	Fine	205	260
30-Apr-13	12:00	01-May-13	12:00	2.6952	2.8611	8076.69	8100.69	24.00	1.2200	1.2200	1.2200	94	Cloudy	205	260
											Min	80	} for		
											Max	104	} reporting		
											Average	91	} period		

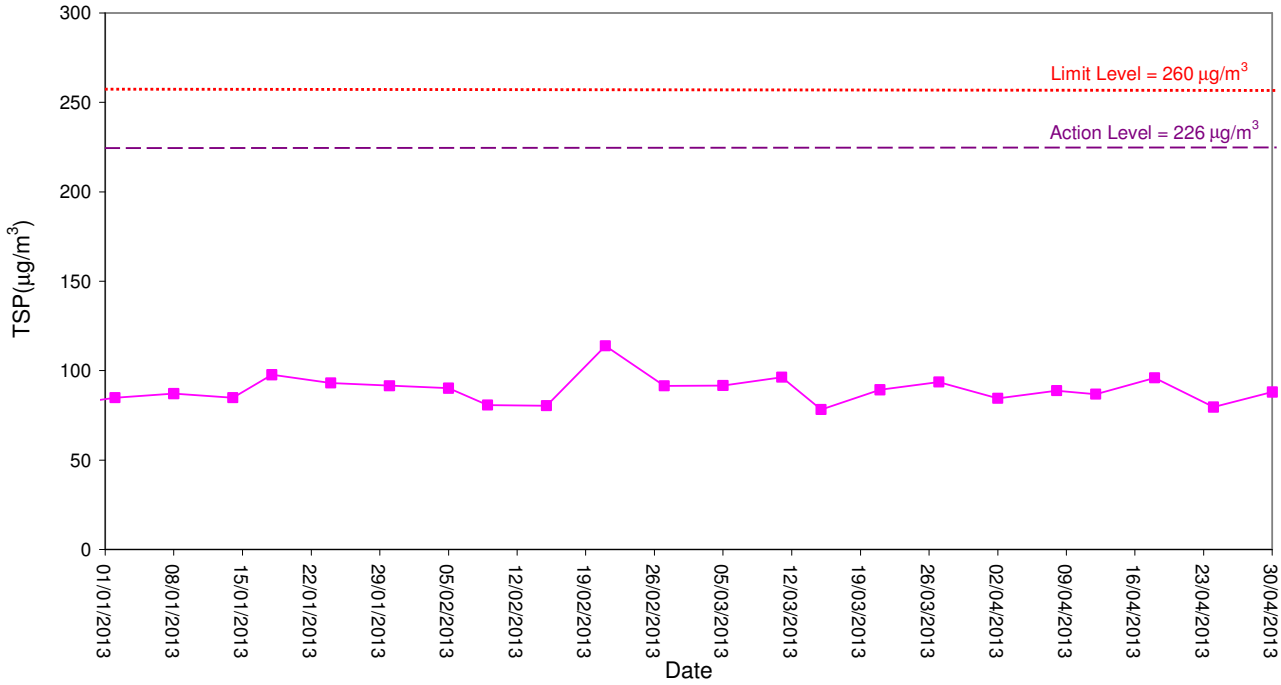
Air Quality (24-hr TSP)

Station ASR4

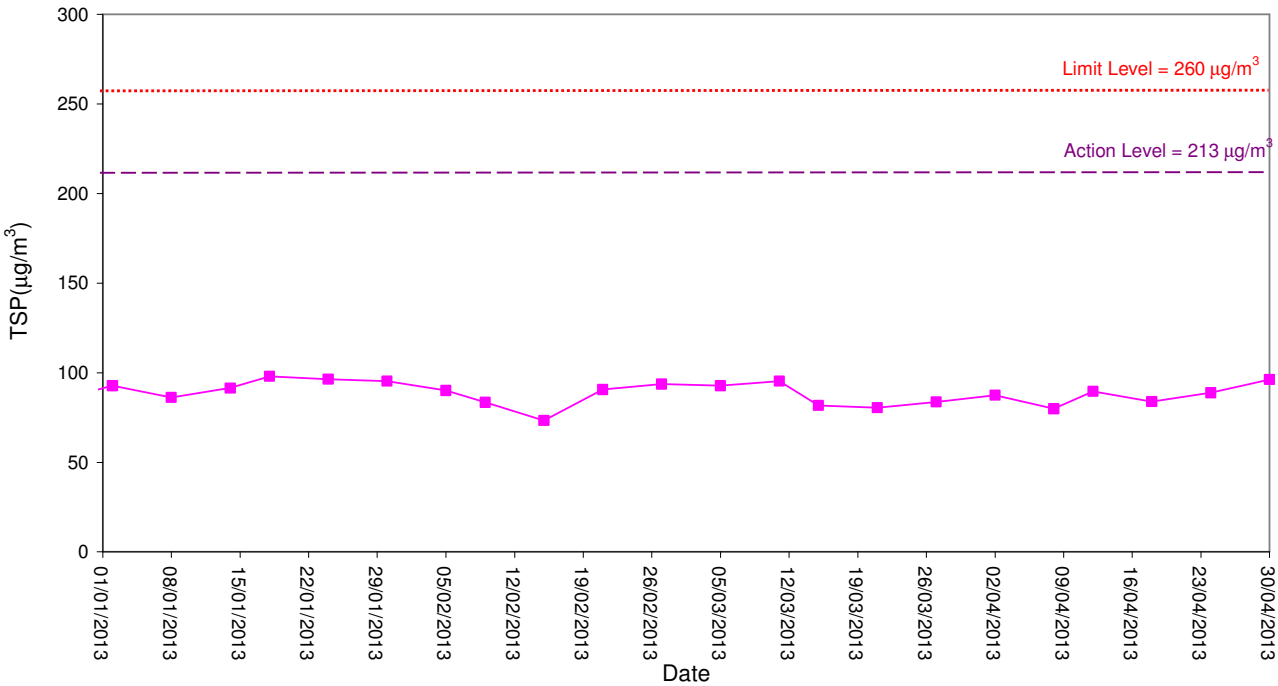
Start		Finish		Filter Weight (g)		Elapsed Time Reading		Sampling Time (hrs)	Flow Rate (m3/min)			Conc. (µg/m^3)	Weather Condition	Action Level	Limit Level
Date	Time	Date	Time	Initial	Final	Initial	Final		Initial	Final	Average				
05-Feb-13	13:06	06-Feb-13	13:06	2.8154	2.9771	14621.87	14645.87	24.00	1.2300	1.2300	1.2300	91	Cloudy	237	260
09-Feb-13	13:10	10-Feb-13	13:10	2.7998	2.9449	14645.87	14669.87	24.00	1.2300	1.2300	1.2300	82	Fine	237	260
15-Feb-13	13:06	16-Feb-13	13:06	2.8235	2.9614	14669.87	14693.87	24.00	1.2300	1.2300	1.2300	78	Cloudy	237	260
21-Feb-13	13:04	22-Feb-13	13:04	2.7945	2.9919	14693.87	14717.87	24.00	1.2300	1.2300	1.2300	111	Fine	237	260
27-Feb-13	13:09	28-Feb-13	13:09	2.8175	2.9790	14717.87	14741.87	24.00	1.2300	1.2300	1.2300	91	Fine	237	260
05-Mar-13	13:46	06-Mar-13	13:46	2.7988	2.9707	14741.87	14765.87	24.00	1.2000	1.2000	1.2000	99	Fine	237	260
11-Mar-13	13:02	12-Mar-13	13:02	2.8231	2.9906	14765.87	14789.87	24.00	1.2000	1.2000	1.2000	97	Fine	237	260
15-Mar-13	13:06	16-Mar-13	13:06	2.8066	2.9510	14789.87	14813.87	24.00	1.2000	1.2000	1.2000	84	Fine	237	260
21-Mar-13	13:03	22-Mar-13	13:03	2.8066	2.9603	14813.87	14837.87	24.00	1.2000	1.2000	1.2000	89	Cloudy	237	260
27-Mar-13	13:09	28-Mar-13	13:09	2.8177	2.9744	14837.87	14861.87	24.00	1.2000	1.2000	1.2000	91	Cloudy	237	260
02-Apr-13	13:20	03-Apr-13	13:20	2.8235	2.9696	14861.87	14885.87	24.00	1.2000	1.2000	1.2000	85	Cloudy	237	260
08-Apr-13	13:00	09-Apr-13	13:00	2.8149	2.9609	14885.87	14909.87	24.00	1.2000	1.2000	1.2000	84	Cloudy	237	260
12-Apr-13	13:06	13-Apr-13	13:06	2.8067	2.9548	14909.87	14933.87	24.00	1.2000	1.2000	1.2000	86	Cloudy	237	260
18-Apr-13	13:12	19-Apr-13	13:12	2.8221	2.9981	14933.87	14957.87	24.00	1.2000	1.2000	1.2000	102	Cloudy	237	260
24-Apr-13	13:01	25-Apr-13	13:01	2.8159	2.9714	14957.87	14981.87	24.00	1.2000	1.2000	1.2000	90	Fine	237	260
30-Apr-13	13:32	01-May-13	13:32	2.6156	2.7811	14981.87	15005.87	24.00	1.2000	1.2000	1.2000	96	Cloudy	237	260
											Min	78	} for		
											Max	111	} reporting		
											Average	91	} period		

Air Quality

24-hour TSP Level at ASR1

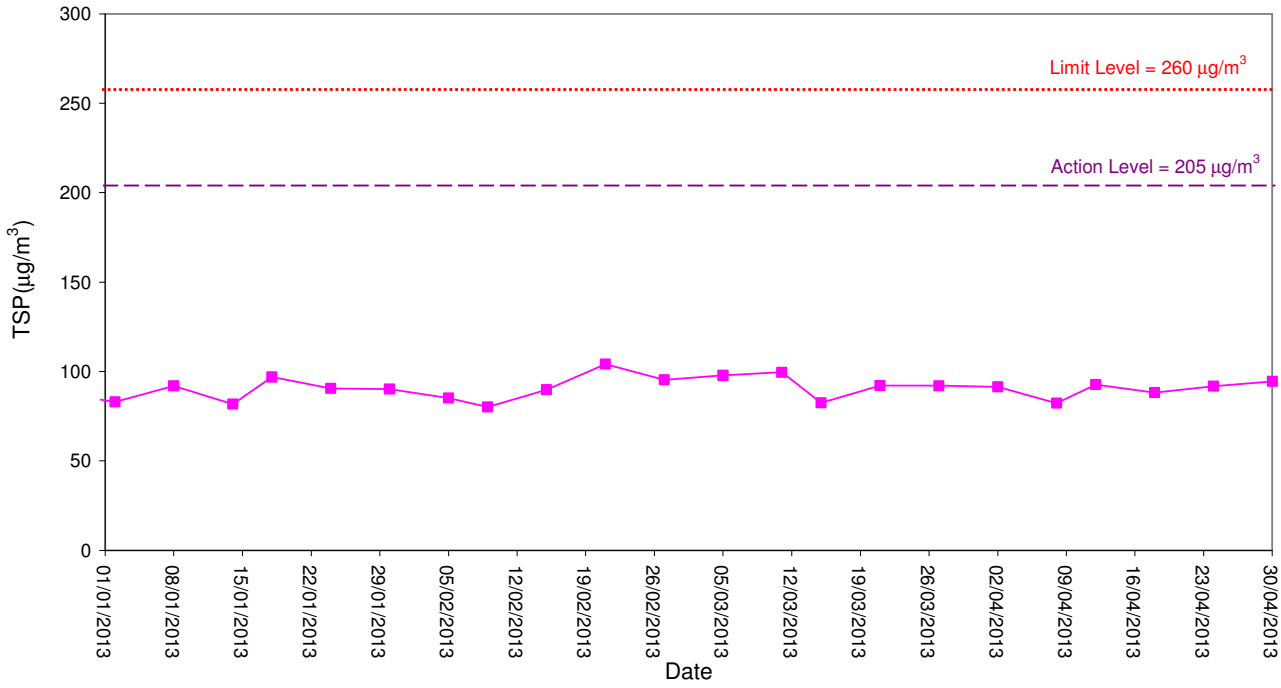


24-hour TSP Level at ASR2A

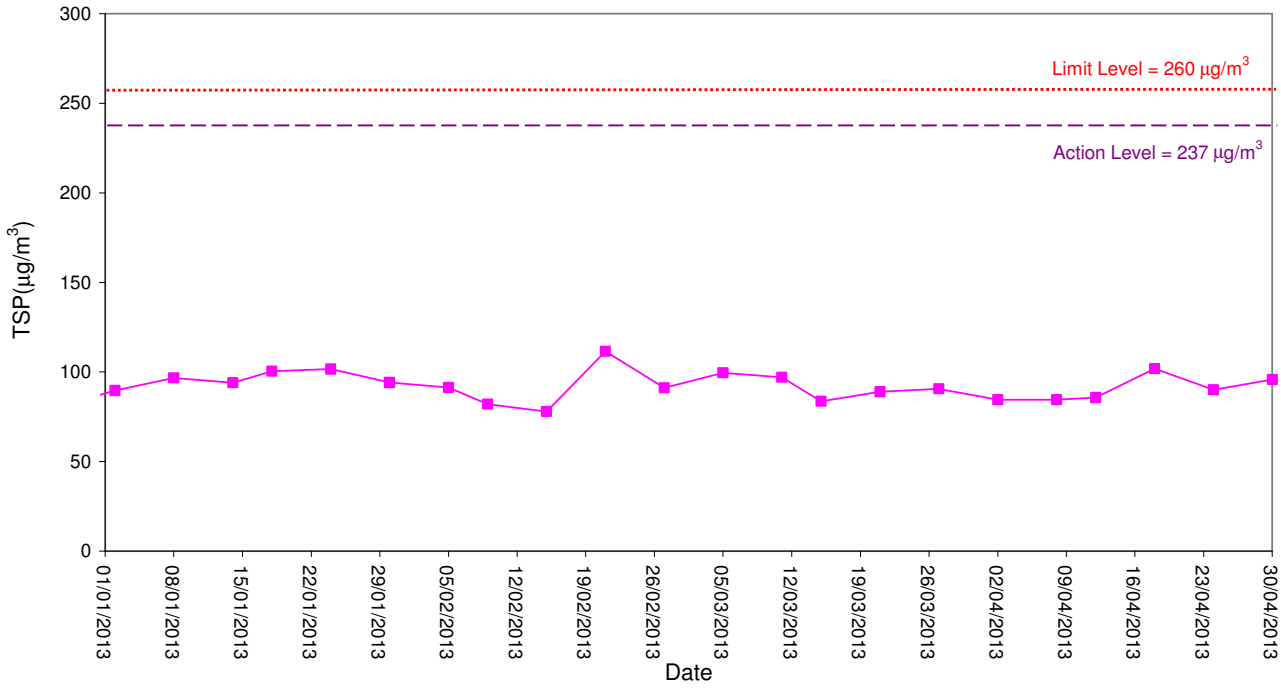


Air Quality

24-hour TSP Level at ASR3



24-hour TSP Level at ASR4



Noise

Station NSR1

Date	Start Time	End Time	Noise Level for 30 min, dB(A)			Wind Speed (m/s)	Weather Condition	Limit Level, dB(A)
			L_{eq}	L_{10}	L_{90}			
05-Feb-13	14:50	15:20	56	59	52	0.2	Cloudy	75
15-Feb-13	14:46	15:16	55	57	52	0.2	Cloudy	75
21-Feb-13	15:29	15:59	58	60	49	0.2	Fine	75
27-Feb-13	14:56	15:26	55	58	43	0.2	Fine	75
05-Mar-13	16:04	16:34	56	59	51	0.2	Fine	75
11-Mar-13	15:49	16:19	54	57	48	0.3	Fine	75
21-Mar-13	15:36	16:06	58	60	56	0.3	Cloudy	75
27-Mar-13	16:08	16:38	54	57	48	0.2	Cloudy	75
02-Apr-13	15:55	16:25	56	59	48	0.2	Cloudy	75
08-Apr-13	15:32	16:02	58	60	55	0.2	Cloudy	75
18-Apr-13	15:56	16:26	55	58	53	0.2	Cloudy	75
24-Apr-13	15:39	16:09	54	57	49	0.2	Fine	75
30-Apr-13	16:06	16:36	55	58	49	0.2	Cloudy	75

Station NSR3

Date	Start Time	End Time	Noise Level for 30 min, dB(A)			Wind Speed (m/s)	Weather Condition	Limit Level, dB(A)
			L_{eq}	L_{10}	L_{90}			
05-Feb-13	15:32	16:02	53	56	48	0.2	Cloudy	75
15-Feb-13	15:28	15:58	56	58	48	0.2	Cloudy	75
21-Feb-13	14:47	15:17	56	58	54	0.2	Fine	75
27-Feb-13	15:37	16:07	53	57	50	0.2	Fine	75
05-Mar-13	16:45	17:15	59	62	56	0.2	Fine	75
11-Mar-13	15:08	15:38	58	59	54	0.3	Fine	75
21-Mar-13	14:56	15:26	56	58	51	0.3	Cloudy	75
27-Mar-13	15:28	15:58	56	58	51	0.2	Cloudy	75
02-Apr-13	15:15	15:45	54	58	52	0.2	Cloudy	75
08-Apr-13	14:50	15:20	56	58	46	0.2	Cloudy	75
18-Apr-13	16:38	17:08	56	58	48	0.2	Cloudy	75
24-Apr-13	14:56	15:26	56	59	51	0.2	Fine	75
30-Apr-13	15:22	15:52	56	58	51	0.2	Cloudy	75

Noise

Station NSR5

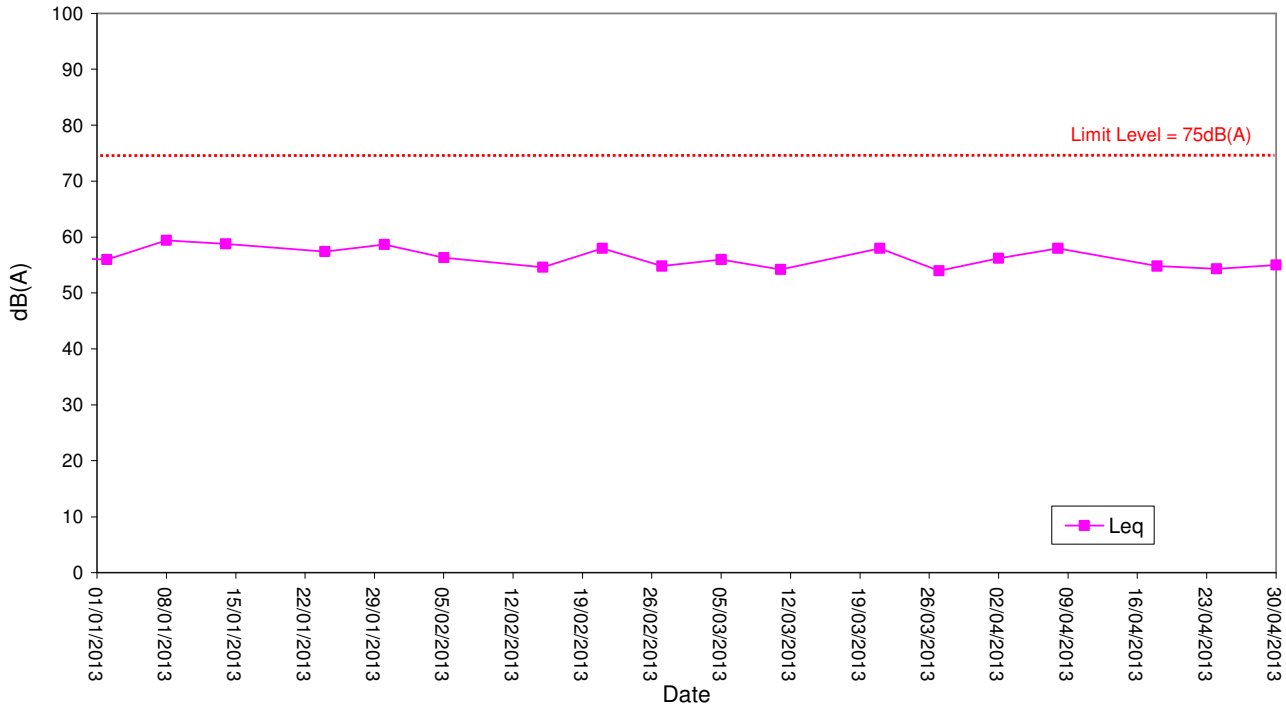
Date	Start Time	End Time	Noise Level for 30 min, dB(A)			Wind Speed (m/s)	Weather Condition	Limit Level, dB(A)
			L_{eq}	L_{10}	L_{90}			
05-Feb-13	13:19	13:49	59	61	55	0.2	Cloudy	75
15-Feb-13	13:21	13:51	58	59	54	0.2	Cloudy	75
21-Feb-13	13:21	13:51	55	59	57	0.2	Fine	75
27-Feb-13	13:22	13:52	57	58	56	0.2	Fine	75
05-Mar-13	14:30	15:00	59	61	56	0.2	Fine	75
11-Mar-13	13:34	14:04	59	62	56	0.3	Fine	75
21-Mar-13	13:19	13:49	60	63	58	0.3	Cloudy	75
27-Mar-13	13:29	13:59	60	63	57	0.2	Cloudy	75
02-Apr-13	13:48	14:18	59	61	56	0.2	Cloudy	75
08-Apr-13	13:18	13:48	59	61	57	0.2	Cloudy	75
18-Apr-13	13:28	13:58	59	61	56	0.2	Cloudy	75
24-Apr-13	13:19	13:49	62	65	58	0.2	Fine	75
30-Apr-13	14:02	14:32	59	61	54	0.2	Cloudy	75

Station NSR7

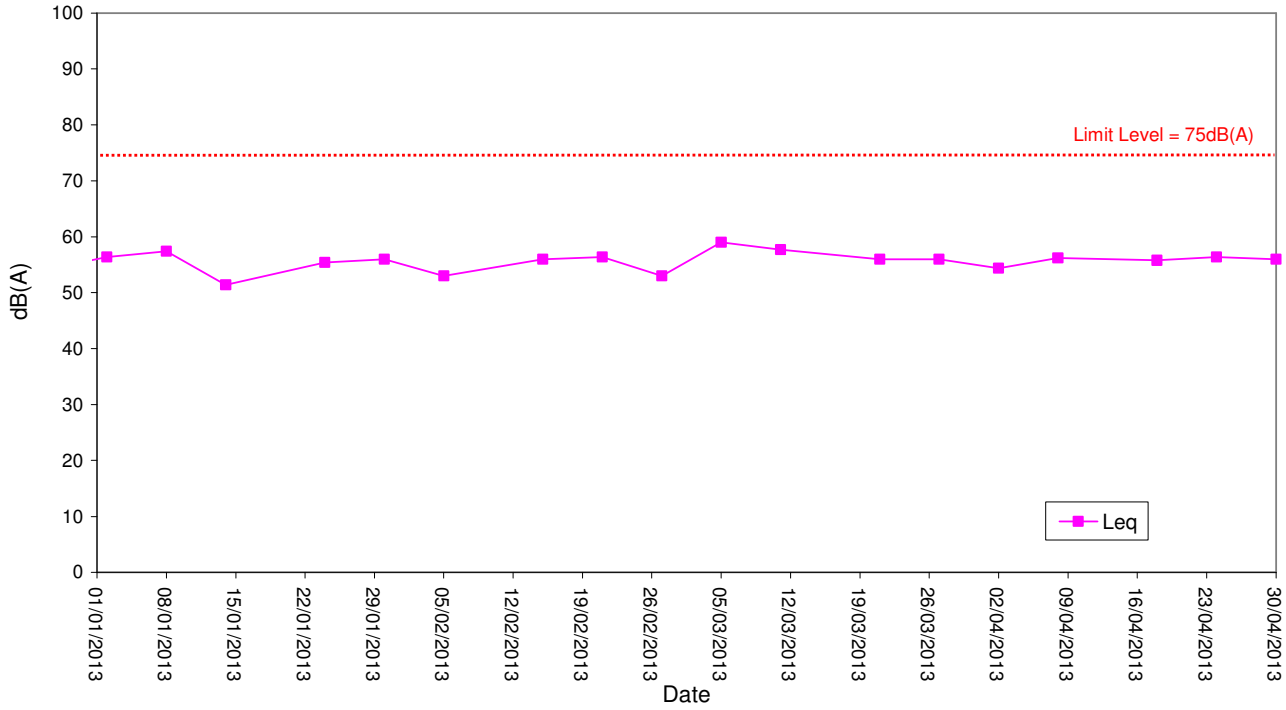
Date	Start Time	End Time	Noise Level for 30 min, dB(A)			Wind Speed (m/s)	Weather Condition	Limit Level, dB(A)
			L_{eq}	L_{10}	L_{90}			
05-Feb-13	14:02	14:32	66	67	61	0.2	Cloudy	75
15-Feb-13	14:04	14:34	63	67	59	0.2	Cloudy	75
21-Feb-13	14:03	14:33	67	69	65	0.2	Fine	75
27-Feb-13	14:08	14:38	66	69	62	0.2	Fine	75
05-Mar-13	15:14	15:44	66	69	58	0.2	Fine	75
11-Mar-13	14:28	14:58	65	67	58	0.3	Fine	75
21-Mar-13	14:10	14:40	64	68	62	0.3	Cloudy	75
27-Mar-13	14:46	15:16	66	68	62	0.2	Cloudy	75
02-Apr-13	14:38	15:08	65	68	59	0.2	Cloudy	75
08-Apr-13	14:02	14:32	64	67	58	0.2	Cloudy	75
18-Apr-13	14:18	14:48	62	65	59	0.2	Cloudy	75
24-Apr-13	14:09	14:39	68	71	64	0.2	Fine	75
30-Apr-13	14:42	15:12	65	68	58	0.2	Cloudy	75

Noise

Noise Level for 30 min, dB(A), at NSR1

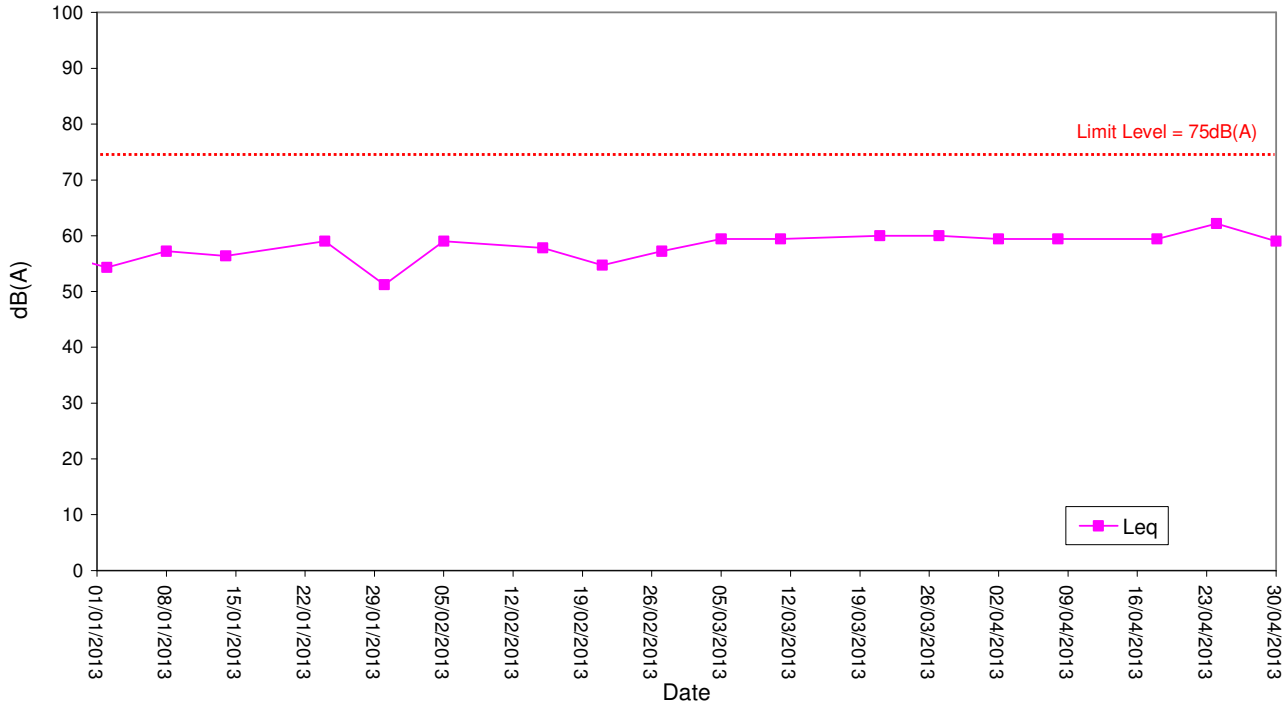


Noise Level for 30 min, dB(A), at NSR3

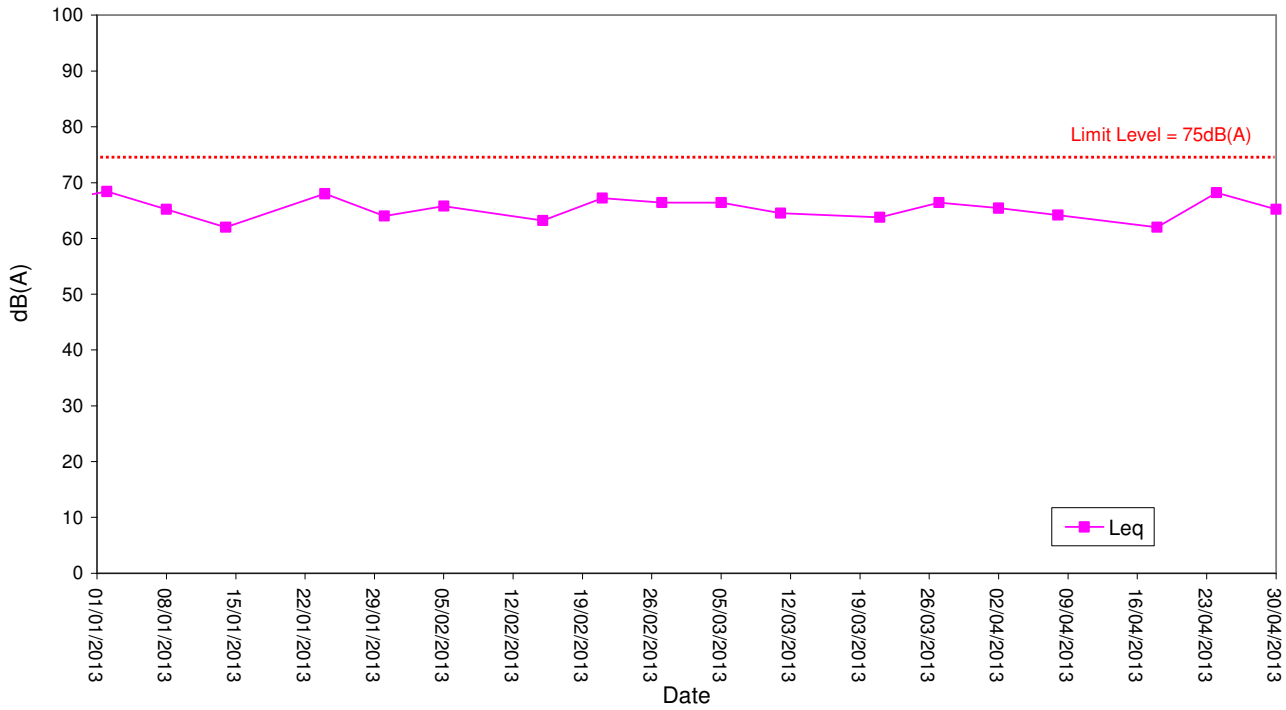


Noise

Noise Level for 30 min, dB(A), at NSR5



Noise Level for 30 min, dB(A), at NSR7



Water Quality

Monitoring Location MP3

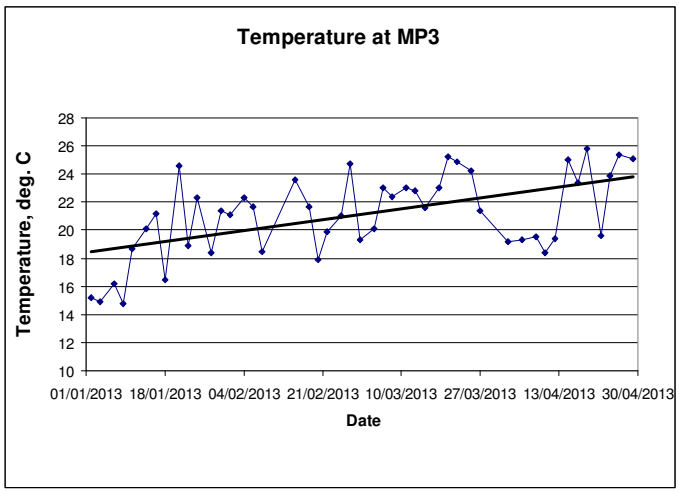
Monitoring Date	Temp (°C)	pH	Dissolved Oxygen (mg/L)	DOS (%)	Turbidity (NT)	BOD (mg/L)	Suspended Solids (mg/L)
MP3							
01/02/2013	21.1	7.4	7.7	87.8	30.6	7.5	22
04/02/2013	22.3	7.2	**6.7**	71.8	32.8	12.5	18.5
06/02/2013	21.7	7.3	7.3	84.0	22.9	6	17.5
08/02/2013	18.5	7.4	7.1	81.4	58.0	5	46
15/02/2013	23.6	7.3	**6.2**	70.9	39.0	4.5	28
18/02/2013	21.7	7.2	**6.5**	75.8	30.2	6.5	23.5
20/02/2013	17.9	7.3	**5.7**	60.8	**104.5**	14	**85.5**
22/02/2013	19.9	7.2	**5.4**	51.7	47.8	5	46
25/02/2013	21.0	7.2	6.9	77.5	62.6	5.5	57
27/02/2013	24.7	7.3	7.2	81.8	34.3	3.5	23
01/03/2013	19.3	7.2	**6.5**	69.1	40.9	2.5	36
04/03/2013	20.1	7.2	7.2	81.8	45.0	2	41.5
06/03/2013	23.0	7.2	7.6	89.7	20.9	3	16
08/03/2013	22.4	7.3	**5.1**	58.9	46.2	2.5	50
11/03/2013	23.0	7.2	**5.1**	59.9	34.3	4	35
13/03/2013	22.8	7.3	**5.0**	58.7	21.2	3.5	18.5
15/03/2013	21.6	7.3	**5.3**	60.4	42.7	3	42
18/03/2013	23.0	7.2	**5.4**	63.4	35.5	4	3
20/03/2013	25.2	7.5	**5.0**	60.8	49.4	9	45.5
22/03/2013	24.9	7.3	**5.9**	71.0	15.4	4	13.5
25/03/2013	24.2	7.2	**4.8**	57.1	51.9	5.5	48.5
27/03/2013	21.4	7.2	**6.1**	69.8	22.8	6	20
02/04/2013	19.2	7.3	**6.0**	64.7	43.5	3	42.5
05/04/2013	19.3	7.3	**6.0**	64.2	34.7	4	25.5
08/04/2013	19.5	7.3	7.4	80.9	21.4	5.5	17.5
10/04/2013	18.4	7.3	7.3	77.7	21.4	5	35.5
12/04/2013	19.4	7.3	**6.7**	73.6	39.3	3	32.5
15/04/2013	25.0	7.3	**6.5**	78.8	12.0	5	10
17/04/2013	23.4	7.3	**5.5**	65.2	30.7	12.5	26.5
19/04/2013	25.8	7.2	**5.2**	62.7	14.2	7	13
22/04/2013	19.6	7.2	**5.2**	64.0	46.0	5	50.5
24/04/2013	23.9	7.2	**4.4**	51.5	25.7	5	23.5
26/04/2013	25.4	7.2	**2.9**	35.2	40.7	5	45
29/04/2013	25.1	7.2	**4.9**	59.5	55.2	6	55.5
Average	22.0	7.3	6.0	68.3	37.4	5.4	32.8
Action Level	-	<5.5 or >7.5	<6.85	-	>64	-	>65
Limit Level	-	<4.0 or >8.0	<6.65	-	>67	-	>66

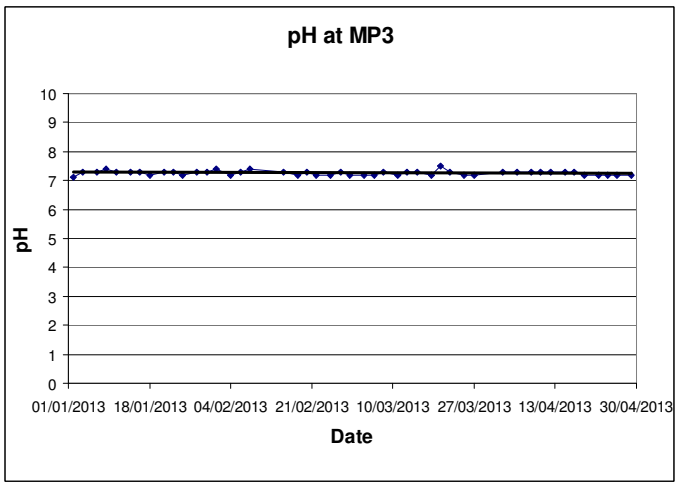
Notes:

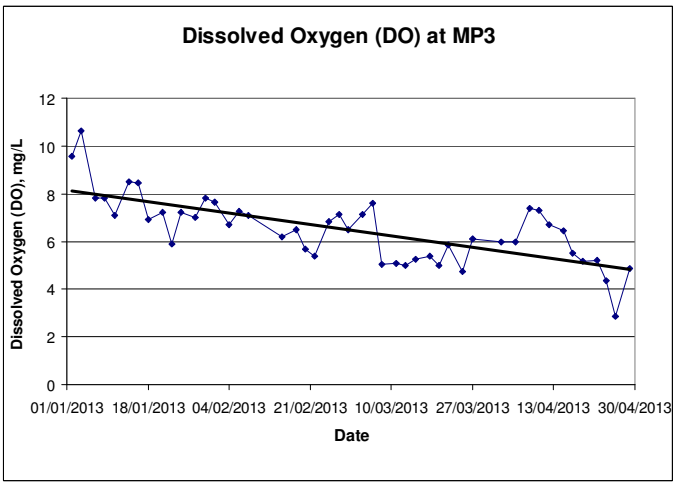
(1) BOD value is too low to indicate (<2mg/L).

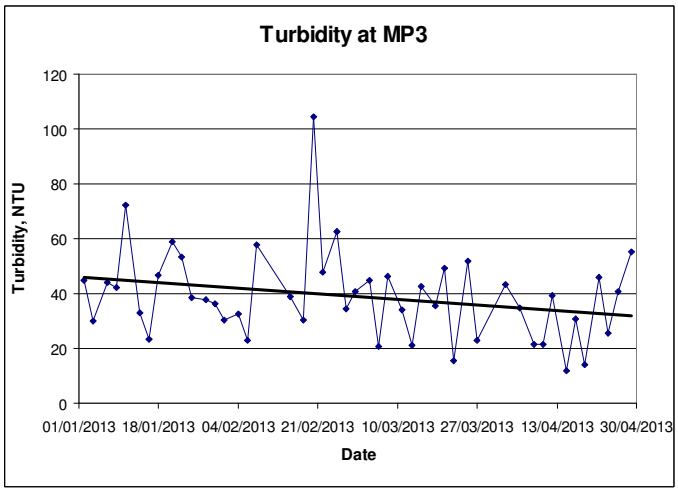
Values **Bold** indicate Action Level exceedance.
Values **Underlined and Bold** indicate Limit Level exceedance.

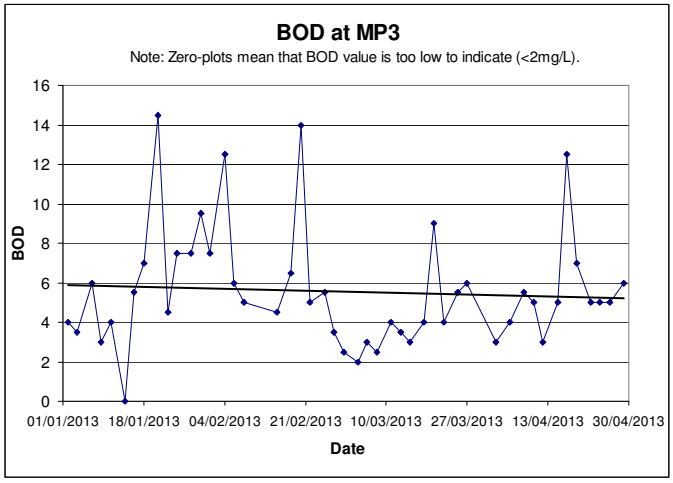
Water Quality

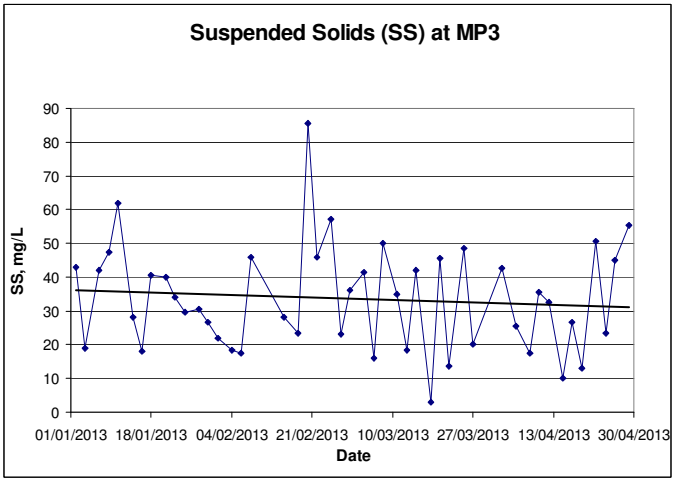












Water Quality

Monitoring Location MP4

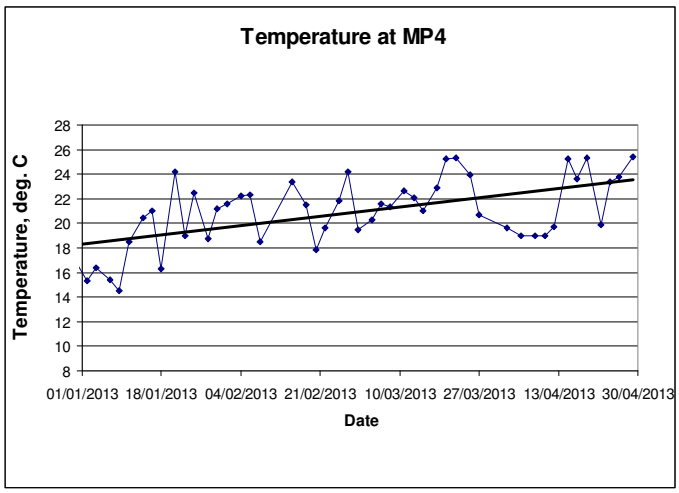
Monitoring Date	Temp (°C)	pH	Dissolved Oxygen (mg/L)	DOS (%)	Turbidity (NT)	BOD (mg/L)	Suspended Solids (mg/L)
MP4							
01/02/2013	21.6	**7.6**	6.9	75.8	29.9	3	20
04/02/2013	22.2	7.3	5.8	61.8	24.5	4.5	10.5
06/02/2013	22.3	7.4	6.0	65.9	20.7	6	14.5
08/02/2013	18.5	7.4	5.8	60.0	23.9	5.5	23.5
15/02/2013	23.4	7.4	5.6	55.8	30.6	2	20.5
18/02/2013	21.5	7.4	5.8	58.2	56.0	7	48.5
20/02/2013	17.8	7.3	6.3	71.9	24.8	4	24.5
22/02/2013	19.6	7.3	**3.9**	41.8	21.7	4	19.5
25/02/2013	21.8	7.3	7.9	92.6	41.3	6.5	45
27/02/2013	24.2	7.3	7.9	92.9	43.6	6.5	28
01/03/2013	19.5	7.3	5.8	62.3	33.5	3.5	40
04/03/2013	20.3	7.4	6.0	65.9	38.3	2	36
06/03/2013	21.6	7.3	5.7	64.8	16.5	3	17.5
08/03/2013	21.3	7.4	5.1	57.4	16.3	3	19.5
11/03/2013	22.6	7.4	5.3	61.3	24.4	3	25.5
13/03/2013	22.1	7.4	**3.2**	36.3	24.7	4	31
15/03/2013	21.0	7.4	5.1	57.4	28.3	5.5	31
18/03/2013	22.9	7.3	6.3	73.2	**61.1**	21.5	4
20/03/2013	25.2	7.2	4.0	48.5	19.0	5	23
22/03/2013	25.3	7.4	5.1	61.7	31.4	7	36
25/03/2013	23.9	7.5	**1.7**	20.5	38.3	7.5	33.5
27/03/2013	20.7	7.4	**3.6**	40.0	26.3	8	36
02/04/2013	19.6	7.5	**3.6**	42.3	28.2	5	26
05/04/2013	19.0	7.4	**3.8**	46.0	**73.0**	4	47
08/04/2013	19.0	7.4	4.0	43.0	25.4	5.5	31.5
10/04/2013	19.0	7.4	4.2	46.6	25.4	2	37.5
12/04/2013	19.7	7.4	4.2	45.7	28.3	2	18.5
15/04/2013	25.2	7.4	**3.4**	41.9	18.4	6.5	23
17/04/2013	23.6	7.4	4.2	49.1	18.6	10.5	22.5
19/04/2013	25.3	7.3	**3.4**	40.3	21.6	7	18
22/04/2013	19.9	7.3	4.4	54.7	21.2	4	27
24/04/2013	23.4	7.4	**2.7**	32.7	35.8	6	33.5
26/04/2013	23.8	7.3	**3.6**	42.4	29.9	5	32
29/04/2013	25.4	7.3	4.0	48.4	12.8	5	16
Average	21.8	7.4	4.8	54.7	29.8	5.4	27.1
Action Level	-	<5.5 or >7.5	<3.91	-	>60	-	>50
Limit Level	-	<4.0 or >8.0	<3.82	-	>64	-	>53

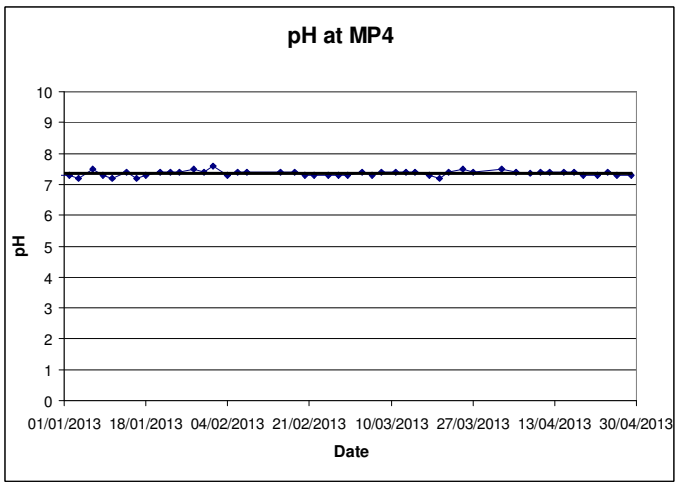
Notes:

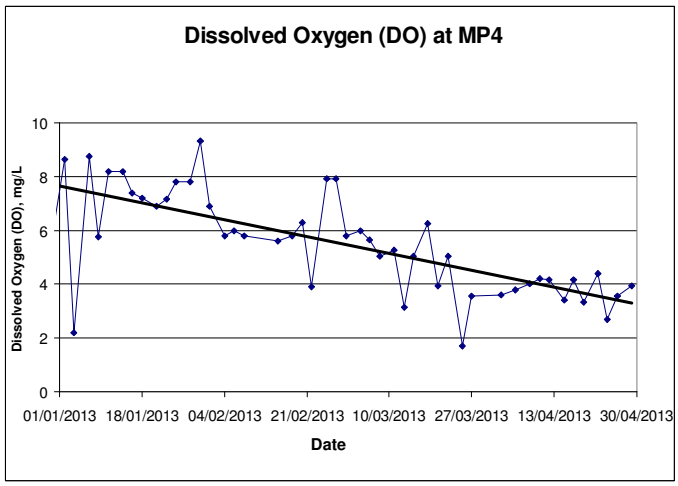
(1) BOD value is too low to indicate (<2mg/L).

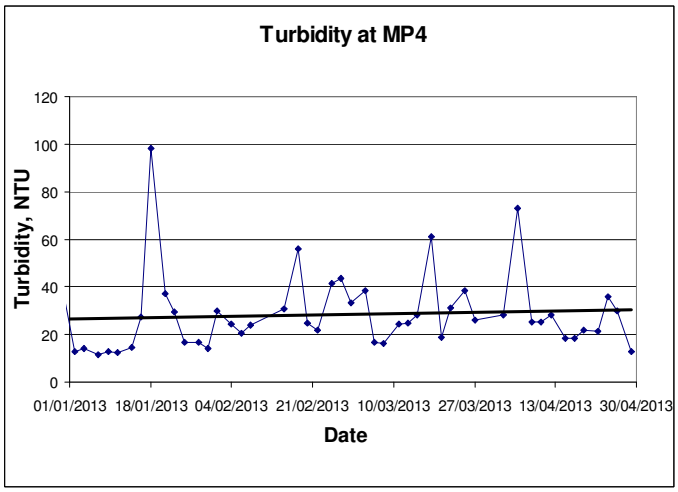
Values **Bold** indicate Action Level exceedance.
Values **Underlined and Bold** indicate Limit Level exceedance.

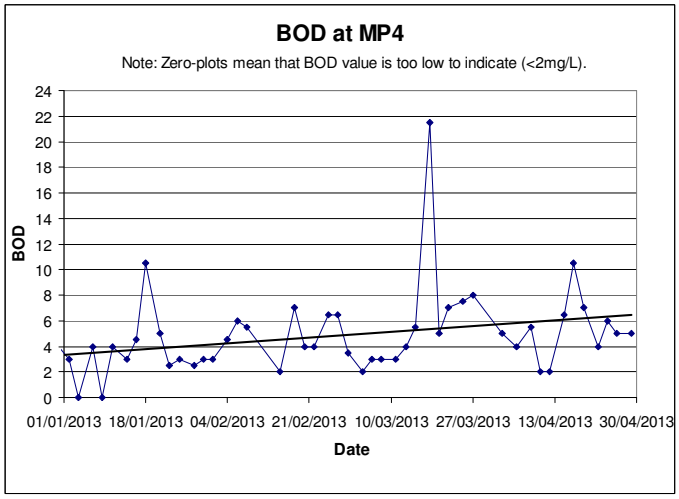
Water Quality

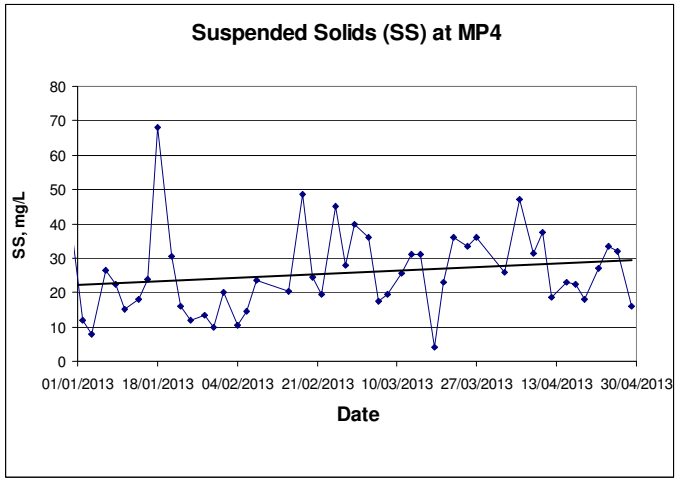












Water Quality

Monitoring Location MP5

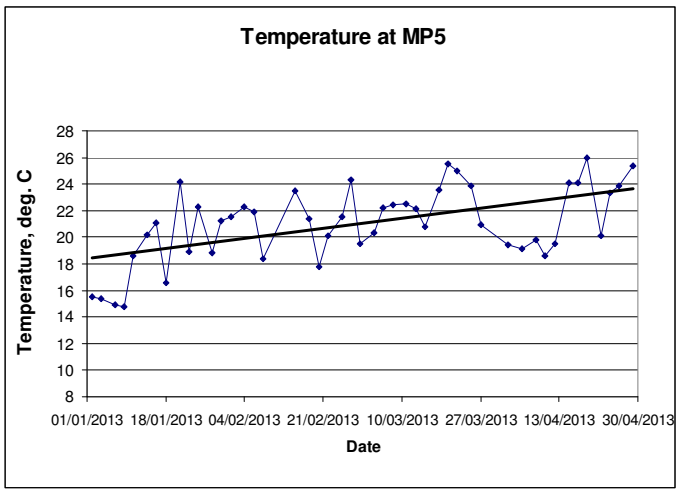
Monitoring Date	Temp (°C)	pH	Dissolved Oxygen (mg/L)	DOS (%)	Turbidity (NT)	BOD (mg/L)	Suspended Solids (mg/L)
MP5							
01/02/2013	21.5	7.5	7.3	82.0	29.7	4	21.5
04/02/2013	22.3	7.3	5.6	58.5	27.5	6	21.5
06/02/2013	21.9	7.4	6.3	72.1	18.3	6	12.5
08/02/2013	18.4	7.5	6.3	72.7	28.4	5.5	25
15/02/2013	23.5	7.5	6.1	68.0	31.8	4	20.5
18/02/2013	21.4	7.4	6.0	63.2	43.6	5.5	39.5
20/02/2013	17.8	7.4	6.2	70.3	49.0	4.5	46
22/02/2013	20.1	7.3	5.4	53.1	28.5	4	27
25/02/2013	21.5	7.4	6.7	75.3	24.9	3.5	27
27/02/2013	24.3	7.5	6.7	75.8	23.8	4.5	24.5
01/03/2013	19.5	7.4	5.4	54.9	37.9	3.5	40.5
04/03/2013	20.3	7.4	6.6	74.0	61.5	2.5	**70**
06/03/2013	22.2	7.4	5.0	57.2	26.5	2.5	27.5
08/03/2013	22.4	7.5	**2.7**	30.8	29.6	2.5	37
11/03/2013	22.5	7.5	**2.9**	33.6	9.0	4	9
13/03/2013	22.1	7.5	**2.3**	26.0	9.3	3.5	30
15/03/2013	20.8	7.5	**3.8**	42.1	26.6	7	26
18/03/2013	23.6	7.3	6.0	71.1	62.3	18	50
20/03/2013	25.5	7.3	**3.7**	45.8	34.8	5	32
22/03/2013	25.0	7.5	4.9	59.3	38.5	4	53.5
25/03/2013	23.9	7.5	**2.5**	30.1	17.1	8	16
27/03/2013	20.9	7.5	**3.9**	44.2	58.9	8	60
02/04/2013	19.4	7.5	**4.1**	51.4	52.5	6	41
05/04/2013	19.1	7.4	4.3	55.8	**86.2**	6	52
08/04/2013	19.8	7.5	4.8	53.4	52.2	5	44
10/04/2013	18.6	7.5	4.8	51.9	52.2	5.5	50.5
12/04/2013	19.5	7.5	5.1	55.5	41.2	8	33.5
15/04/2013	24.1	7.5	**3.4**	40.3	57.9	8	53.5
17/04/2013	24.1	7.5	**4.0**	47.3	23.6	8.5	24
19/04/2013	26.0	7.4	**3.1**	37.5	48.2	5	41
22/04/2013	20.1	7.4	**3.3**	40.8	35.0	4.5	38.5
24/04/2013	23.4	7.5	**3.1**	36.4	35.2	8	45.5
26/04/2013	23.9	7.4	4.2	50.4	46.5	7.5	42
29/04/2013	25.4	7.5	4.3	52.2	40.5	4	**76.5**
Average	21.9	7.4	4.7	53.9	37.9	5.6	37.0
Action Level	-	<5.5 or >7.5	<4.13	-	>81	-	>66
Limit Level	-	<4.0 or >8.0	<3.87	-	>84	-	>69

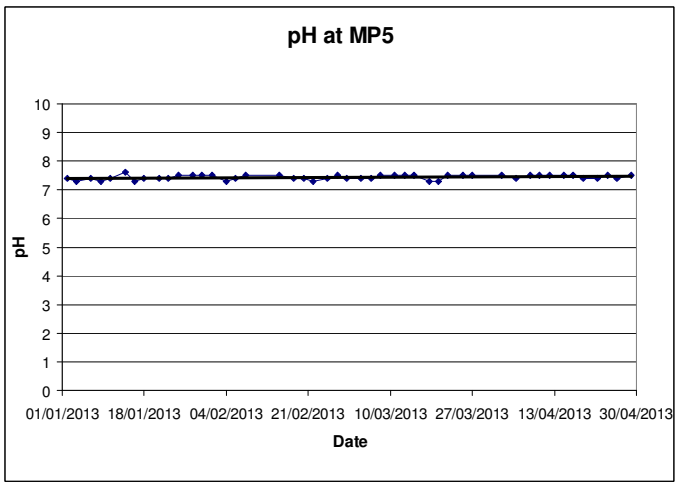
Notes:

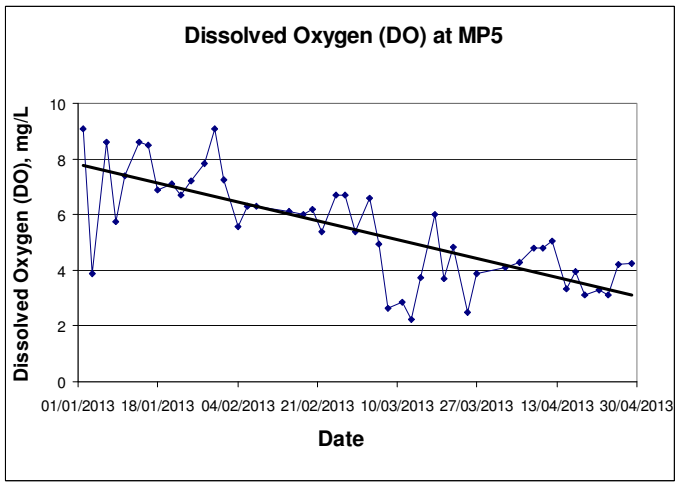
(1) BOD value is too low to indicate (<2mg/L).

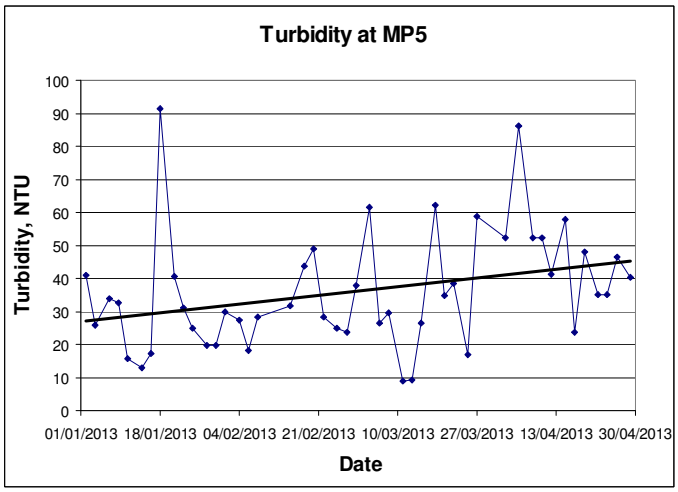
Values **Bold** indicate Action Level exceedance.
Values **Underlined and Bold** indicate Limit Level exceedance.

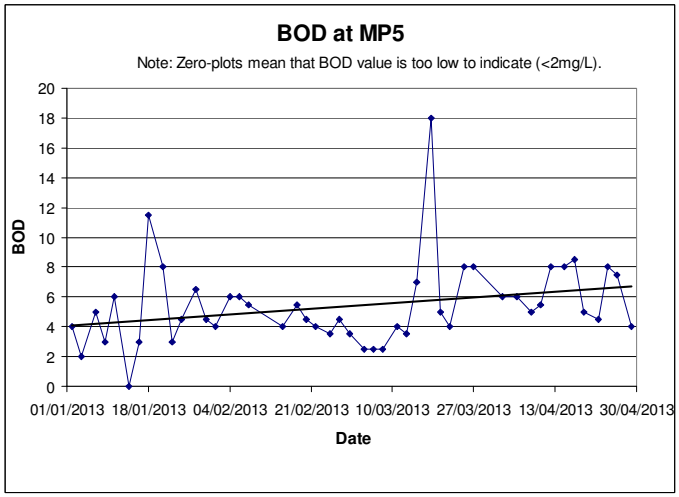
Water Quality

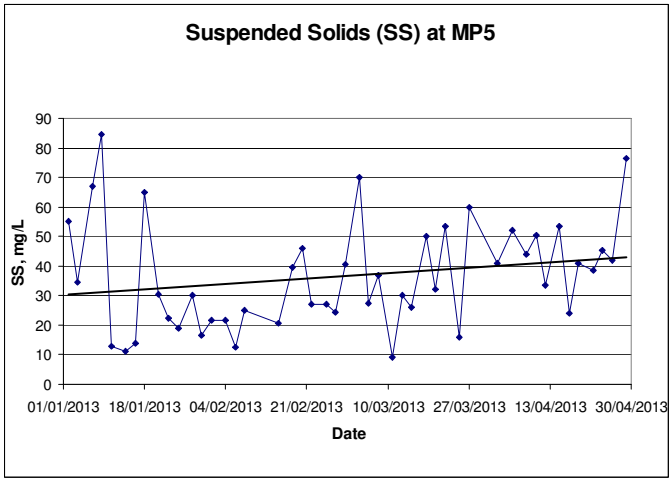












Water Quality

Monitoring Location MP6

Monitoring Date	Temp (°C)	pH	Dissolved Oxygen (mg/L)	DOS (%)	Turbidity (NT)	BOD (mg/L)	Suspended Solids (mg/L)
MP6							
01/02/2013	21.6	**7.6**	8.9	100.7	19.3	2	13
04/02/2013	22.1	7.5	7.1	80.1	17.9	3	6.5
06/02/2013	22.2	7.5	7.9	92.1	11.5	3	5.5
08/02/2013	18.5	7.5	7.3	84.7	18.9	4	11.5
15/02/2013	23.1	7.5	7.1	80.9	17.1	<2	11
18/02/2013	21.6	7.4	7.0	78.6	31.2	2.5	23.5
20/02/2013	17.6	7.5	6.9	78.2	38.7	4.5	35.5
22/02/2013	20.1	7.5	5.7	60.9	15.1	3	12
25/02/2013	21.3	7.5	7.7	90.7	16.4	2.5	12.5
27/02/2013	24.2	7.5	7.4	85.8	26.6	5	31
01/03/2013	19.6	7.5	6.7	71.2	25.8	2.5	21.5
04/03/2013	20.2	7.5	7.6	89.8	39.3	<2	51.5
06/03/2013	22.4	7.5	7.8	90.6	38.7	5	67
08/03/2013	22.9	7.5	7.0	81.8	30.3	4	**87**
11/03/2013	22.5	7.5	6.6	77.0	19.1	6.5	18.5
13/03/2013	22.2	7.5	6.2	71.5	19.3	8	57
15/03/2013	20.9	7.5	6.0	67.8	29.3	12	34.5
18/03/2013	24.1	7.3	**4.4**	52.9	64.6	13.5	**76**
20/03/2013	26.1	7.3	**3.8**	46.7	43.3	8.5	43.5
22/03/2013	24.9	7.5	4.9	60.2	58.3	5	**79.5**
25/03/2013	23.9	7.5	5.8	69.1	32.5	10	37
27/03/2013	20.5	7.5	6.2	69.0	**167.0**	13.5	**157**
02/04/2013	19.4	7.5	6.0	65.2	78.7	8	**87**
05/04/2013	19.2	7.5	6.3	71.0	**193.0**	6	**133.5**
08/04/2013	19.9	7.5	4.9	53.8	46.3	6	44.5
10/04/2013	19.1	7.5	5.1	54.6	46.3	5.5	38
12/04/2013	19.1	7.5	6.4	69.6	45.6	8	33
15/04/2013	25.1	7.5	5.5	66.4	36.4	12	37.5
17/04/2013	24.3	7.5	5.1	60.6	52.0	7	56
19/04/2013	25.5	7.5	**4.4**	53.6	84.7	6.5	**92**
22/04/2013	19.6	7.5	5.0	61.5	43.7	6.5	47
24/04/2013	23.1	7.5	**4.6**	53.2	**129.0**	8	**156**
26/04/2013	23.7	7.5	5.2	61.6	61.6	10	63.5
29/04/2013	25.7	7.5	5.2	63.7	86.7	4	**129.5**
Average	21.9	7.5	6.2	71.0	49.5	N/A	53.2
Action Level	-	<5.5 or >7.5	<4.61	-	>94	-	>75
Limit Level	-	<4.0 or >8.0	<4.52	-	>96	-	>75

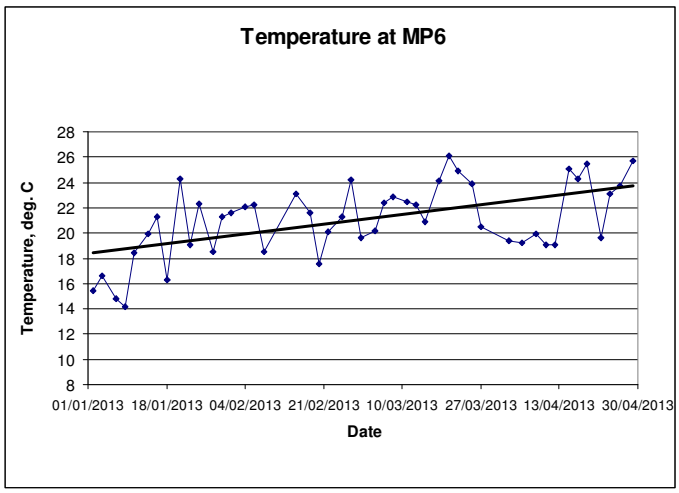
Notes:

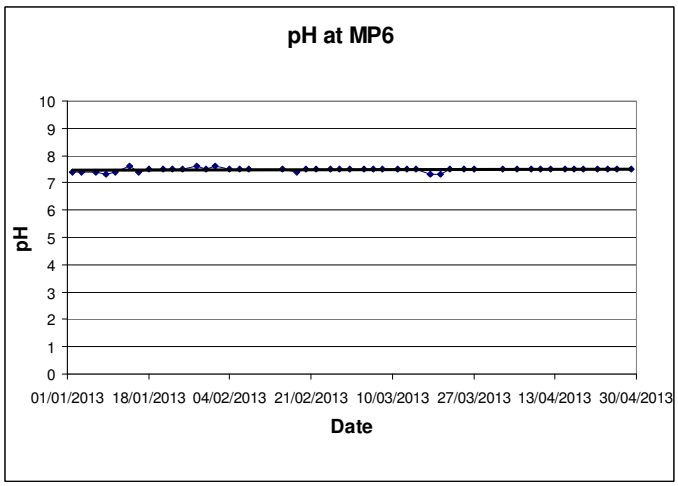
(1) BOD value is too low to indicate (<2mg/L).

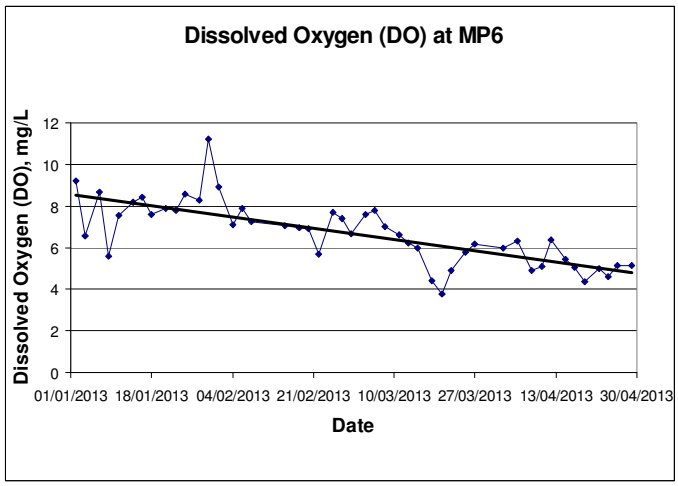
Values **Bold** indicate Action Level exceedance.

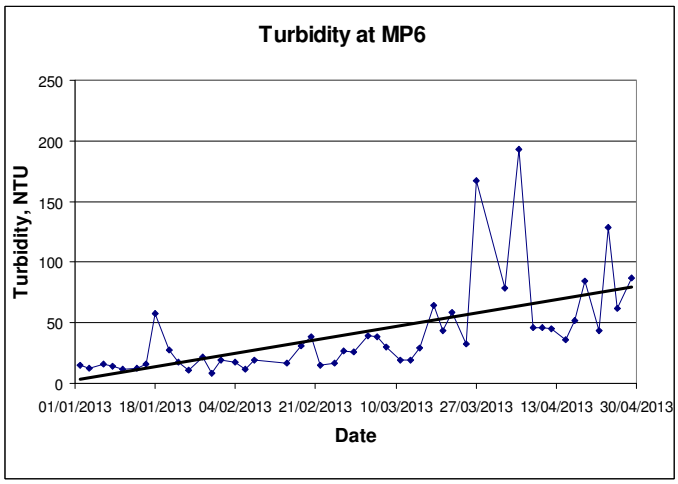
Values **Underlined and Bold** indicate Limit Level exceedance.

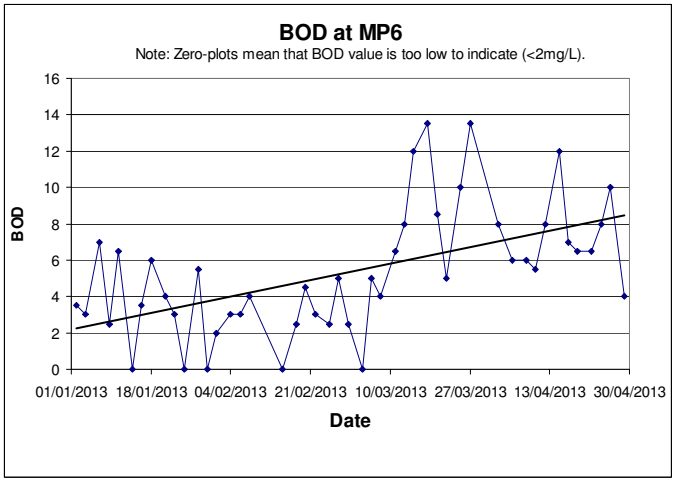
Water Quality

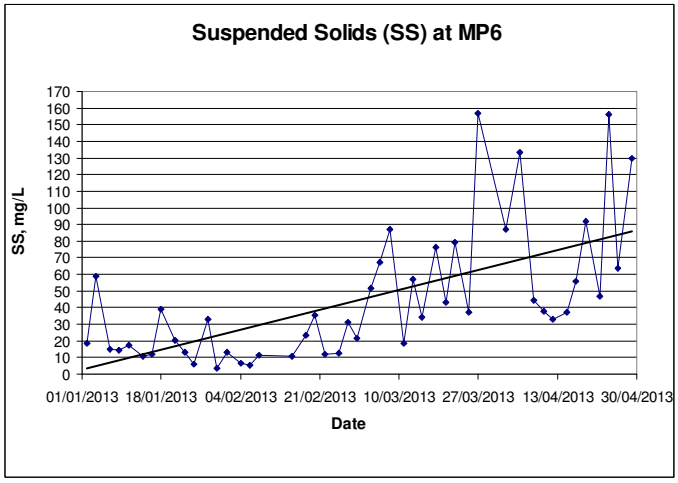












Appendix E. Summary of Ecological Monitoring results

Table E1. Summary of bird monitoring in the Survey Area (excluding the WRA)

Species Name	Scientific Name[5]	Conservation Status [2]	Occurrence[3]	Mean[4]
			Feb 2013	
Little Grebe	*Tachybaptus ruficollis*	LC, (1)	5	11.4
Great Cormorant	*Phalacrocorax carbo*	PRC, (1)	5	8.4
Chinese Pond Heron	*Ardeola bacchus*	PRC, (RC), (1)	5	6.0
Great Egret	*Egretta alba*	PRC, (RC), (1)	5	1.8
Little Egret	*Egretta garzetta*	PRC, (RC), (1)	5	8.2
Grey Heron	*Ardea cinerea*	PRC, (1)	5	6.2
Black-faced Spoonbill	*Platalea minor*	PGC, (1)	2	0.8
Tufted Duck	*Aythya fuligula*	LC, (1)	5	19.2
Black Kite	*Milvus migrans*	(RC)	1	0.2
White-breasted Waterhen	*Amaurornis phoenicurus*	(1)	2	0.6
Common Moorhen	*Gallinula chloropus*	(1)	5	2.6
Little Ringed Plover	*Charadrius dubius*	LC, (1)	2	1.2
Green Sandpiper	*Tringa ochropus*	(1)	2	0.4
Common Sandpiper	*Actitis hypoleucos*	(1)	5	2.0
White-throated Kingfisher	*Halcyon smyrnensis*	LC, (1)	4	0.8
Common Kingfisher	*Alcedo atthis*	(1)	4	1.4
White Wagtail	*Motacilla alba*	(1)	5	5.8
Eastern Yellow Wagtail	*Motacilla tschutschensis*	(1)	5	5.6
Red-billed Starling	*Spodiopsar sericeus*	RC, (1)	1	0.4
Zitting Cisticola	*Cisticola juncidis*	LC, (1)	1	0.4
		No. of Species Recorded	**20**	

Species Name	Scientific Name[5]	Conservation Status [2]	Occurrence[3]	Mean[4]
			Mar 2013	
Little Grebe	*Tachybaptus ruficollis*	LC, (1)	5	10.0
Great Cormorant	*Phalacrocorax carbo*	PRC, (1)	3	2.0
Chinese Pond Heron	*Ardeola bacchus*	PRC, (RC), (1)	5	2.0
Little Egret	*Egretta garzetta*	PRC, (RC), (1)	5	15.4
Great Egret	*Egretta alba*	PRC, (RC), (1)	4	2.8
Grey Heron	*Ardea cinerea*	PRC, (1)	4	2.4
Black-faced Spoonbill	*Platalea minor*	PGC, (1)	1	0.6
Tufted Duck	*Aythya fuligula*	LC, (1)	5	10.4
Black Kite	*Milvus migrans*	(RC)	3	1.0
White-breasted Waterhen	*Amaurornis phoenicurus*	(1)	1	0.4
Common Moorhen	*Gallinula chloropus*	(1)	3	0.8
Little Ringed Plover	*Charadrius dubius*	LC, (1)	2	1.8
Common Sandpiper	*Actitis hypoleucos*	(1)	5	2.0
Pied Kingfisher	*Ceryle rudis*	LC, (1)	1	0.2
White-throated Kingfisher	*Halcyon smyrnensis*	LC, (1)	3	0.8
Common Kingfisher	*Alcedo atthis*	(1)	4	2.0
Eastern Yellow Wagtail	*Motacilla tschutschensis*	(1)	5	6.6
White Wagtail	*Motacilla alba*	(1)	5	4.4
		No. of Species Recorded	**18**	

Species Name[6]	Scientific Name[5]	Conservation Status [2]	Occurrence[3]	Mean[4]
			Apr 2013	
Little Grebe	*Tachybaptus ruficollis*	LC, (1)	5	6.4
Black-crowned Night Heron	*Nycticorax nycticorax*	(LC), (1)	2	0.4

Chinese Pond Heron	*Ardeola bacchus*	PRC, (RC), (1)	4	2.4
Little Egret	*Egretta garzetta*	PRC, (RC), (1)	5	15.2
Intermediate Egret	*Egretta intermedia*	RC, (1)	1	0.2
Great Egret	*Egretta alba*	PRC, (RC), (1)	4	6.4
Grey Heron	*Ardea cinerea*	PRC, (1)	1	0.2
Tufted Duck	*Aythya fuligula*	LC, (1)	5	1.2
Osprey	*Pandion haliaetus*	RC, (1)	1	0.2
White-breasted Waterhen	*Amaurornis phoenicurus*	(1)	4	1.0
Common Moorhen	*Gallinula chloropus*	(1)	2	0.4
Green Sandpiper	*Tringa ochropus*	(1)	3	0.6
Common Sandpiper	*Actitis hypoleucos*	(1)	3	1.4
Whiskered Tern	*Chlidonias hybrida*	LC, (1)	2	2.8
White-throated Kingfisher	*Halcyon smyrnensis*	LC, (1)	1	0.2
Common Kingfisher	*Alcedo atthis*	(1)	4	1.2
Eastern Yellow Wagtail	*Motacilla tschutschensis*	(1)	4	2.6
White Wagtail	*Motacilla alba*	(1)	4	1.6
Red-billed Starling	*Spodiopsar sericeus*	(1)	2	1.2
		No. of Species Recorded	**19**	

(1) Indicates wetland-dependant or wetland-associated species.

(2) Conservation status follows that of Fellowes et al. (2002) and BirdLife International listing (2011).

(3) Indicates number of surveys recorded within each month of the reporting period.

(4) Refers to the mean number of individuals recorded in each survey in the Survey Area (excluding the WRA).

(5) Follows HK bird list (dated 2013-03-25).

Table E2. Summary of bird monitoring in the WRA

Species Name	Scientific Name[5]	Conservation Status [2]	Occurrence[3]	Mean[4]	Records outside surveys
			Feb 2013		
Little Grebe	*Tachybaptus ruficollis*	LC, (1)	2	0.4	✓
Great Cormorant	*Phalacrocorax carbo*	PRC, (1)	3	1.0	
Grey Heron	*Ardea cinerea*	PRC, (1)	2	1.4	✓
Great Egret	*Egretta alba*	PRC, (RC), (1)	3	0.8	✓
Little Egret	*Egretta garzetta*	PRC, (RC), (1)	3	1.4	
Chinese Pond Heron	*Ardeola bacchus*	PRC, (RC), (1)	1	0.4	
Black-crowned Night Heron	*Nycticorax nycticorax*	LC, (1)	1	0.2	
White -breasted Waterhen	*Amaurornis phoenicurus*	(1)	-	-	✓
Little Ringed Plover	*Charadrius dubius*	LC, (1)	4	1.0	
Wood Sandpiper	*Tringa glareola*	LC, (1)	-	-	✓
Common Kingfisher	*Alcedo atthis*	(1)	2	0.4	✓
Eastern Yellow Wagtail	*Motacilla tschutschensis*	(1)	3	2.8	✓
White Wagtail	*Motacilla alba*	(1)	5	3.0	✓
		No. of Species Recorded	**13**		**-**
Species Name	**Scientific Name[5]**	**Conservation Status [2]**	**Occurrence[3]**	**Mean[4]**	**Records outside surveys**
			Mar 2013		
Little Grebe	*Tachybaptus ruficollis*	LC, (1)	2	0.6	
Chinese Pond Heron	*Ardeola bacchus*	PRC, (RC), (1)	-	-	✓
Little Egret	*Egretta garzetta*	PRC, (RC), (1)	3	0.6	
Great Egret	*Egretta alba*	PRC, (RC), (1)	1	0.2	

Species Name	Scientific Name[5]	Conservation Status [2]	Occurrence[3]	Mean[4]	Records outside surveys
Black Kite	*Milvus migrons*	RC	2	0.6	
White -breasted Waterhen	*Amaurornis phoenicurus*	(1)	2	0.4	✓
Little Ringed Plover	*Charadrius dubius*	LC, (1)	1	0.2	
Common Greenshank	*Tringa nebularia*	LC, (1)	-	-	✓
Wood Sandpiper	*Tringa glareola*	LC, (1)	-	-	✓
Common Sandpiper	*Actitis hypoleucos*	(1)	-	-	✓
Common Kingfisher	*Alcedo atthis*	(1)	1	0.2	
Eastern Yellow Wagtail	*Motacilla tschutschensis*	(1)	4	2.2	
White Wagtail	*Motacilla alba*	(1)	5	4.8	✓
Zitting Cistocola	*Cisticola juncidis*	LC, (1)	-	-	✓
No. of Species Recorded			**14**		**-**

Species Name[6]	Scientific Name[5]	Conservation Status [2]	Occurrence[3]	Mean[4]	Records outside surveys
			Apr 2013		
Little Grebe	*Tachybaptus ruficollis*	LC, (1)	1	0.4	✓
Yellow Bittern	*Ixobrychus sinensis*	LC, (1)	-	-	✓
Chinese Pond Heron	*Ardeola bacchus*	PRC, (RC), (1)	-	-	✓
Little Egret	*Egretta garzetta*	PRC, (RC), (1)	2	1.2	
Great Egret	*Egretta alba*	PRC, (RC), (1)	2	0.6	
White-breasted Waterhen	*Amaurornis phoenicurus*	(1)	1	0.2	✓
Green Sandpiper	*Tringa ochropus*	(1)	1	0.2	
Common Sandpiper	*Actitis hypoleucos*	(1)	1	0.2	✓
Common Snipe	*Gallinago gallinago*	(1)	-	-	✓
Pied Kingfisher	*Ceryle rudis*	(LC), (1)	-	-	✓
Common Kingfisher	*Alcedo atthis*	(1)	1	0.2	
Eastern Yellow Wagtail	*Motacilla tschutschensis*	(1)	4	2.2	
White Wagtail	*Motacilla alba*	(1)	5	2.0	
Collared Crow	*Corvus torquatus*	LC, (1)	-	-	✓
No. of Species Recorded			**14**		**-**

(1) indicates wetland-dependant or -associated species.

(2) Conservation status follows that of Fellowes et al. (2002) and BirdLife International listing (2011).

(3) indicates number of surveys recorded within each month of the reporting period.

(4) refers to the mean number of individuals recorded in each survey in the WRA

(5) follows HK bird list (dated 2013-03-25).

Table E3. Summary of herpetofauna monitoring in the Survey Area (excluding the WRA)

Species Name	Scientific Name	Conservation Status[1]	Feb 2013	
			Occurrence[2]	Mean[3]
Amphibian				
(No survey scheduled in Feb 2013)				
			Occurrence[2]	**Mean[3]**
Reptile				
(No survey scheduled in Feb 2013)				
Species Name	**Scientific Name**	**Conservation Status[1]**	**Mar 2013**	
			Occurrence[2]	**Mean[3]**
Amphibian				
(No survey scheduled in Mar 2013)				

			Occurrence[2]	Mean[3]
Reptile				
(No survey scheduled in Mar 2013)				
Species Name	**Scientific Name**	**Conservation Status[1]**	**Apr 2013**	
			Occurrence[2]	**Mean[3]**
Amphibian	**No. of Species Recorded**		**0**	
(No records in Apr 2013)				
			Occurrence[2]	**Mean[3]**
Reptile	**No. of Species Recorded**		**0**	
(No records in Apr 2013)				

(1) Conservation status follows that of Fellowes et al. (2002), Chan et al. (2005) and Karsen et al. (1998).

(2) indicates number of surveys recorded within the reporting period.

(3) refers to the mean number of individuals recorded in each survey in the survey (excluding the WRA).

Table E4. Summary of herpetofauna monitoring in the WRA

Species Name	**Scientific Name**	**Conservation Status[1]**	**Feb 2013**	
			Occurrence[2]	**Mean[3]**
Amphibian				
(No survey scheduled in Feb 2013)				
			Occurrence[2]	**Mean[3]**
Reptiles				
(No survey scheduled in Feb 2013)				
Species Name	**Scientific Name**	**Conservation Status[1]**	**Mar 2013**	
			Occurrence[2]	**Mean[3]**
Amphibian				
(No survey scheduled in Mar 2013)				
			Occurrence[2]	**Mean[3]**
Reptiles				
(No survey scheduled in Mar 2013)				
Species Name	**Scientific Name**	**Conservation Status[1]**	**Apr 2013**	
			Occurrence[2]	**Mean[3]**
Amphibian	**No. of Species Recorded**		**0**	
(No records in Apr 2013)				
			Occurrence[2]	**Mean[3]**
Reptiles	**No. of Species Recorded**		**0**	
(No records in Apr 2013)				

(1) Conservation status follows that of Fellowes et al. (2002), Chan et al. (2005) and Karsen et al. (1998).

(2) indicates number of surveys recorded within the reporting period.

(3) refers to the mean number of individuals recorded in each survey in the WRA.

Table E5. Summary of mammal monitoring in the Survey Area (excluding the WRA)

Species Name	Scientific Name	Conservation Status[1]	Feb 2013	
			Occurrence[2]	Mean[3]
Mammal	No. of Species Recorded		0	
(No Records in Feb 2013)				
Species Name	Scientific Name	Conservation Status[1]	Mar 2013	
			Occurrence[2]	Mean[3]
Mammal	No. of Species Recorded		0	
(No Records in Mar 2013)				
Species Name	Scientific Name	Conservation Status[1]	Apr 2013	
			Occurrence[2]	Mean[3]
Mammal	No. of Species Recorded		0	
(*No Records in Apr 2013)*				

(1) Conservation status follows that of Fellowes *et al.* (2002) and Shek (2006).

(2) indicates number of surveys recorded within the survey period.

(3) refers to the mean number of individuals recorded in each survey

Table E6. Summary of mammal monitoring in the WRA

Species Name	Scientific Name	Conservation Status[1]	Feb 2013		Records outside surveys
			Occurrence[2]	Mean[3]	
Mammal	No. of Species Recorded		1		
Japanese Pipistrelles	*Pipistrellus abramus*	LC	-	-	✓
Species Name	Scientific Name	Conservation Status[1]	Mar 2013		Records outside surveys
			Occurrence[2]	Mean[3]	
Mammal	No. of Species Recorded		0		
(No Records in Mar 2013)					
Species Name	Scientific Name	Conservation Status[1]	Apr 2013		Records outside surveys
			Occurrence[2]	Mean[3]	
Mammal	No. of Species Recorded		0		
(*No Records in Apr 2013)*					

(1) Conservation status follows that of Fellowes *et al.* (2002) and Shek (2006).

(2) indicates number of surveys recorded within the survey period.

(3) refers to the mean number of individuals recorded in each survey

Table E7. Summary of dragonfly and butterfly monitoring in the Survey Area (excluding the WRA)

Common Name	Scientific Name	Conservation Status[1]	Feb 2013	
			Occurrence[2]	Mean[3]
Odonate	**No. of Species Recorded**		**0**	
(No Records in Feb 2013)				
Butterfly	**No. of Species Recorded**		**0**	
(No Records in Feb 2013)				
Common Name	**Scientific Name**	**Conservation Status[1]**	**Mar 2013**	
			Occurrence[2]	**Mean[3]**
Odonate	**No. of Species Recorded**		**1**	
Wandering Glider	*Pantala flavescens*		1	1.0
Butterfly	**No. of Species Recorded**		**1**	
Indian Cabbage White	*Pieris canidia*		1	1.0
Common Name	**Scientific Name**	**Conservation Status[1]**	**Apr 2013**	
			Occurrence[2]	**Mean[3]**
Odonate	**No. of Species Recorded**		**3**	
Common Bluetail	*Ischnura senegalensis*	-	1	3.7
Common Flangetail	*Ictionogomphus pertinax*	-	1	0.3
Variegated Flutterer	*Rhyothemis variegata aria*	-	1	1.3
Butterfly	**No. of Species Recorded**		**3**	
Indian Cabbage White	*Pieris canidia*	-	1	0.3
Pale Grass Blue	*Pseudozizeeria maha*	-	1	0.7
Red-base Jezebel	*Delias pasithoe*	-	1	0.3

(1) Conservation status follows that of Fellowes et al. (2002), Lo & Hui (2004), Wilson (2004) and Young & Yiu (2002).

(2) indicates number of surveys recorded within the survey period.

(3) refers to the mean number of individuals recorded in each survey in the survey (excluding the WRA).

Table E8. Summary of dragonfly and butterfly monitoring in the WRA

Common Name	Scientific Name	Conservation Status[1]	Feb 2013	
			Occurrence[2]	Mean[3]
Odonate	**No. of Species Recorded**		**0**	
(No Records in Feb 2013)				
Butterfly	**No. of Species Recorded**		**0**	
(No Records in Feb 2013)		-		
Common Name	**Scientific Name**	**Conservation Status[1]**	**Mar 2013**	
			Occurrence[2]	**Mean[3]**
Odonate	**No. of Species Recorded**		**2**	
Common Bluetail	*Ischnura senegalensis*	-	1	3.0
Wandering Glider	*Pantala flavescens*	-	1	23.0
Butterfly	**No. of Species Recorded**		**2**	
Long-Tailed Blue	*Lampides boeticus*	-	1	1.0
Indian Cabbage White	*Pieris canidia*	-	1	1.0

Common Name	Scientific Name	Conservation Status[1]	Apr 2013	
			Occurrence[2]	Mean[3]
Odonate	**No. of Species Recorded**		**6**	
Asian Amberwing	*Brachythemis contaminata*	-	1	1.3
Common Bluetail	*Ischnura senegalensis*	-	3	26.0
Common Flangetail	*Ictinogomphus pertinax*	-	1	0.3
Green Skimmer	*Orthetrum sabina*	-	1	2.7
Saddlebag Glider	*Tramea virginia*	-	1	0.3
Variegated Flutterer	*Rhyothemis variegata arria*	-	2	8.0
Butterfly	**No. of Species Recorded**		**5**	
Lemon Emigrant	*Catopsilia pomona*	-	1	0.3
Long-tailed Blue	*Lampides boeticus*	-	1	0.3
Mottled Emigrant	*Catopsilia pyranthe*	-	1	0.3
Pale Grass Blue	*Pseudozizeeria maha*	-	1	1.0
Red-base Jezebel	*Delias pasithoe*	-	2	3.7

(1) Conservation status follows that of Fellowes et al. (2002), Lo & Hui (2004), Wilson (2004) and Young & Yiu (2002).

(2) indicates number of surveys recorded within the survey period.

(3) refers to the mean number of individuals recorded in each survey in the survey (excluding the WRA).

Appendix F. Environmental Mitigation Measures - Implementation Status

Environmental Mitigation Measures - Implementation Status

Air Quality – Recommended Mitigation Measures

Air Quality Mitigation Measures during construction	Implementation Status
• access roads should be sprayed with water or dust suppression chemical to maintain the entire road surface wet or paved;	P
• every stock of more than 20 bags of cement or dry PFA should be covered entirely by impervious sheeting or placed in an area sheltered on the top and the 3 sides;	P
• de-bagging, batching or mixing process should be carried out in sheltered areas during the use of bagged cement;	✓
• use of effective dust screens, sheeting or netting to be provided to enclose dry scaffolding which may be provided from the ground floor level of the building or if a canopy is provided at the first floor level, from the first floor level, up to the highest level (maximum four floors for this Project) of the scaffolding where scaffolding is erected around the perimeter of a building under construction;	N/A
• dump trucks for material transport should be totally enclosed using impervious sheeting;	✓
• any excavated dusty materials or stockpile of dusty materials should be covered entirely by impervious sheeting or sprayed with water so as to maintain the entire surface wet, and recovered or backfilled or reinstated within 24 hours of the excavation or unloading;	✓
• dusty materials remaining after a stockpile is removed should be wetted with water;	✓
• the area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with e.g. concrete, bituminous materials or hardcore or similar;	✓
• the portion of road leading only to a construction site that is within 30m of a designated vehicle entrance or exit should be kept clear of dusty materials;	✓
• stockpile of dusty materials to be either covered entirely by impervious sheeting, placed in an area sheltered on the top and the 3 sides; or sprayed with water so as to maintain the entire surface wet;	✓
• all dusty materials to be sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty material wet;	N/A
• vehicle speed to be limited to 10 kph except on completed access roads;	✓
• every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction sites;	✓
• the load of dusty materials carried by vehicle leaving a construction site should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle; and	N/A
• the working area of excavation should be sprayed with water immediately before, during and immediately after (as necessary) the operations so as to maintain the entire surface wet.	N/A
Odour mitigation measures	
• all malodorous excavated material should be placed as far as possible from any ASRs;	N/A
• the stockpiled malodorous material should be removed from site as soon as possible; and	N/A
• the stockpiled malodorous material should be covered entirely by plastic tarpaulin sheets.	N/A

Noise – Recommended Mitigation Measures

Noise Mitigation Measures during construction	Implementation Status
• only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction works;	✓
• machines and plant 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 should, where possible, be orientated to direct noise away from the NSRs;	✓

Environmental Mitigation Measures - Implementation Status

• silencers or mufflers on construction equipment should be utilised and should be properly maintained during the construction period;	✓
• mobile plant should be sited as far away from NSRs as possible;	✓
• material stockpiles and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities; and	✓
• The Contractor shall at all times comply with all current statutory environmental legislation.	✓
Selection of quieter plant and working methods The Contractor shall obtain particular models of plant that are quieter than standards given in GW-TM. The list of assumed quieter plants can be found in the **Table 4–14** of the EIA report. The Contractor shall select from the available models achieving the assumed sound levels while making reference to the GW-TM and BS5228: Part 1: 1997	✓
Use of Noise Barriers Noise barriers are proposed along the site boundary to block the direct line of sight from the most affected NSRs to the major noise contribution construction phases. The height of the noise barriers ranged from 9-10m. The noise barriers shall be built before the commencement of construction works in order to ensure protection to nearby NSRs. The noise barrier should have a surface density of at least 10kg/m^2 or material providing equivalent transmission loss. The noise barriers and hoardings should have no gaps and openings to avoid noise leakage.	P

Water Quality – Recommended Mitigation Measures

Water Quality Mitigation Measures during construction	Implementation Status
• The site should be confined to avoid silt runoff to the site.	✓
• No discharge of silty water into the storm drain and drainage channel within and the vicinity of the site.	✓
• Any soil contaminated with chemicals/oils shall be removed from site and the void created shall be filled with suitable materials.	P
• Stockpiles to be covered by tarpaulin to avoid spreading of materials during rainstorms;	✓
• Suitable containers shall be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport;	✓
• Chemical waste containers shall be labelled with appropriate warning signs in English and Chinese to avoid accidents. there shall also be clear instructions showing what action to take in the event of an accidental;	✓
• Storage areas shall be selected at safe locations on site and adequate space shall be allocated to the storage area;	✓
• Any construction plant which causes pollution to the water system due to leakage of oil or fuel shall be removed off-site immediately;	✓
• Spillage or leakage of chemical waste to be controlled by using suitable absorbent materials;	✓
• Chemicals will always be stored on drip trays or in bunded areas where the volume is 110% of the stored volume;	✓
• Regular clearance of domestic waste generated in the temporary sanitary facilities to avoid waste water spillage.	✓
• Temporary sanitary facilities to be provided for on-site workers during construction.	✓
• Temporary drainage channel and associated facilities will be provided to collect the surface runoff generated within the Project Area during the construction phase.	✓
• Sandbags or silt traps will need to be placed to avoid silt runoff to the drainage channel draining the water in the northern ditch. Draining of the ditches should avoid rainy weather.	✓
• Excavated soil which needs to be temporarily stockpiled should be stored in a specially designated area and provided with a tarpaulin cover to avoid runoff into the drainage channels.	✓

Environmental Mitigation Measures - Implementation Status

Waste Management – Recommended Mitigation Measures

Waste Management Mitigation Measures during construction	Implementation Status
Site Clearance Waste • The major construction works of Wo Shang Wai is in the development of residential buildings and other associated facilities (club house, tennis courts, etc). The amount of site clearance works will be limited with the exception of the excavated materials. The thin layer of vegetation removed can be stored and reused for landscaping.	✓
Excavated Materials The intention is to maximize the reuse of the excavated materials on-site as fill materials.	✓
Imported Filling Material The excavated/imported filling material may have to be temporarily stockpiled on-site for the construction of road embankment and foundation of viaduct substructure. Control measures should be taken at the stockpiling area to prevent the generation of dust and pollution of stormwater channels. However, to eliminate the risk of blocking drains in the wet season, it is recommended that stockpiling of excavated materials at during wet season should be avoided as far as practicable.	N/A
Construction and Demolition Materials Careful design, planning and good site management can minimise over-ordering and generation of waste materials such as concrete, mortars and cement grouts. The design of formwork should maximise the use of standard wooden panels so that high reuse levels can be achieved. Alternatives such as steel formwork of plastic facing should be considered to increase the potential for reuse.	✓
The Contractor should reuse any C&D material on-site. C&D waste should be segregated and stored in different containers to other wastes to encourage the re-use or recycling of materials and their proper disposal.	P
Chemical Waste For those processes which generate chemical waste, it may be possible to find alternatives which generate reduced quantities or even no chemical waste, or less dangerous types of chemical waste.	N/A
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 litres unless the specification have been approved by the EPD; and	✓
• display a label in English and Chinese in accordance with instructions prescribed in Schedule 2 of the Regulations,	✓
The storage area for chemical wastes should:	
• be clearly labelled and used solely for the storage of chemical waste;	✓
• be enclosed on at least 3 sides;	✓
• have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area whichever is the greatest;	P
• have adequate ventilation;	✓
• be covered to prevent rainfall entering (water collected within the bund must be tested and disposed as chemical waste if necessary); and	✓
• be arranged so that incompatible materials are adequately separated.	✓
Disposal of chemical waste should:	
• be via a licensed waste collector; and	N/A
• be to a facility licensed to receive chemical waste, such as the Chemical Waste Treatment Facility which also offers a chemical waste collection service and can supply the necessary storage containers, or	N/A
• to be reuser of the waste, under approval from the EPD.	N/A

Environmental Mitigation Measures - Implementation Status

General Refuse Should be stored in enclosed bins or compaction units separate from C&D and chemical wastes. The Contractor should employ a reputable waste collector to remove general refuse from the site, separate from C&D and chemical wastes, on a regular basis to minimise odour, pest and litter impacts. Burning of refuse on construction sites is prohibited by law.	P
Disposal of Excavated Sediment at Sea	
The requirements and procedures for excavated sediment disposal are specified under the ETWB TCW No. 34/2002 and PNAP 252. The management of the excavation, use and disposal of sediment is monitored by Fill Management Committee, whilst the licensing of marine dumping is the responsibility of the Director of Environmental Protection (DEP).	N/A
The excavated sediment would be loaded onto barges or other appropriate vessel and transported to the designated marine disposal site. Category L sediment and Category M sediment passing the biological test would be suitable for disposal at a gazetted open sea disposal ground. Category M sediment failing the biological test and Category H sediment passing the biological test would require confined marine disposal.	N/A
During transportation and disposal of the dredged sediment, the following measures should be taken to minimize potential impacts on water quality: -	N/A
• Bottom opening transport vessels should be fitted with tight fitting seals to prevent leakage of material. Excess material should be cleaned from the decks and exposed fittings of vessels before the vessel is moved.	N/A
• Monitoring of the barge loading should be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels should be equipped with automatic self-monitoring devices as specified by the DEP.	N/A

Ecology – Recommended Mitigation Measures

Ecology Mitigation Measures during construction	Implementation Status
Clear Definition of Site Limit	
Clear definition of the site limit should be provided in order to minimize and confine the disturbance during the construction period, especially the northern limit of the Site which is adjacent to fishponds within the Conservation Area (CA) zone and are considered to be ecological sensitive receivers. During wetland construction stage the WRA boundary will be delineated using a temporary hoarding in order to reduce disturbance to off-site habitats and wildlife. During the establishment phase this hoarding will be replaced with a 1 m high chain-link fence in order to reduce disturbance to the WRA through access by humans and dogs, and a hoarding will be established around the residential construction site.	✓ ✓
Dust and Noise Suppression and Avoidance of Water Pollution	
Good site practices of dust and noise suppression should be strictly implemented to ensure that disturbance is minimized to acceptable levels. Mitigation measures for the off-site disturbance impacts on the fishponds in the CA include hoarding at the northern site boundary during construction of the WRA to reduce noise and dust impacts to the adjacent habitats. Through the use of quieter plant and temporary/movable noise barriers, the noise level would be reduced significantly to an acceptable level. Hoarding at the northern boundary should be replaced with a 1 m high chain-link fence following construction and the WRA will then act as a buffer between the existing wetland areas and the residential part of the site until construction is completed. Hoarding will be retained between the WRA and ongoing construction work to avoid visual disturbance and reduce noise and dust emissions. Pollution of watercourses and sedimentary runoff will be minimized by good site practice, especially the containment of water and sediment within the site for removal. These standard noise and air and water quality site practices are considered to be effective measures for minimizing the disturbance impact during the construction period.	✓
Planning of Construction Schedule	

Environmental Mitigation Measures - Implementation Status

The construction of the proposed project should be scheduled in phases. Because mitigation is preferably carried out in advance of the main works rather than after the completion of works, the construction of the WRA will commence at the start of the project. Construction work within the WRA is scheduled to take place in a single wet season, followed by 1.5 years of wetland establishment. During the wetland establishment period no noisy work will be undertaken within the WRA to minimize the disturbance to off-site habitats and wildlife.	✓
Reusing Onsite Materials	
Soil and plants on-site should be reused (e.g. used as fill material) as far as practical. Stock piles of these reusable materials should be stored in an appropriate area on-site. In particular, the re-use of the wetland soils and topsoil should be considered.	✓
Construction of the Wetland Restoration Area The WRA will be operational within 2.5 yrs from the commencement of construction (1 year for site formation and 1.5 years for establishment) and will compensate for the predicted ecological impacts of the proposed development.	✓

Landscape and Visual – Recommended Mitigation Measures

Landscape and Visual Mitigation Measures during construction	Implementation Status
CM1- The construction area and contractor's temporary works areas should be minimised to avoid impacts on adjacent landscape.	✓
CM2 - Screening of construction works by hoarding / noise barriers.	✓
CM3 - Reduction of construction period to practical minimum.	✓
CM4 - Topsoil, where identified, should be stripped and stored for re-use in the construction of the soft landscape works, where the soil material meets acceptable criteria and where practical. The Contract Specification shall include storage and reuse of topsoil as appropriate.	✓
CM5 - Hydroseeding or sheeting of soil stockpiles with visually unobtrusive material (in earth tone).	✓
CM6 – Advance screen planting of noise barriers	✓
CM7 - Control night-time lighting and glare by hooding all lights.	N/A
CM8 - Ensure no run-off into streams adjacent to the Project Area.	✓
CM9 - Protection of existing trees on boundary of site shall be carefully protected during construction. Detailed Tree Protection Specification shall be provided in the Contract Specification. Under this specification, the Contractor shall be required to submit, for approval, a detailed working method statement for the protection of trees prior to undertaking any works adjacent to all retained trees, including trees in contractor's works areas. (Tree protection measures will be detailed at S16 and Tree Removal Application stage).	✓
CM10 - Trees unavoidably affected by the works shall be transplanted where practical. Trees should be transplanted straight to their destinations and not held in a nursery. A detailed Tree Transplanting Specification shall be provided in the Contract Specification, if applicable. Sufficient time for necessary tree root and crown preparation periods shall be allowed in the project programme.	✓

Legend:

✓	Implemented
×	Not implemented
P	Partially implemented
N/A	Not applicable