



ENVIRONMENTAL MONITORING AND AUDIT REPORT

FOR

CONTRACT No. CV/2002/13

FILL BANK AT TUEN MUN AREA 38

APRIL 2004

(Revision No. 0)

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EXECUTIVE SUMMARY.

This is the 10th monthly Environmental Monitoring and Audit (EM&A) report for Contract No. CV/2002/13 – Fill Bank at Tuen Mun Area 38. The site has been in operation as a public filling area as part of the reclamation. The site is 24 hours operated except during the Chinese New Year holidays to provide a stable outlet for public fill to serve the construction industry. This report covers the monitoring works conducted during the month of April 2004.

Construction Activities for the Reported Period.

- Public fill operation.
- Operation of tipping hall.
- Hydroseeding to slope surface.

Air Quality Monitoring.

Two stations (A1 and A2) have been identified as the locations for the monitoring of 24-hour and 1-hour Total Suspended Particulates (TSP). The Monitoring of 24-hour TSP was carried out on six occasions at A1 and on seven occasions at A2. Monitoring of 1-hour TSP was carried out on eighteen occasions at A1 and on twenty-one occasions at A2. There was no exceedance to the set action and limit levels for both parameters at A1. Seven exceedances to the 1-hour TSP limit level and one exceedance to the 24-hour TSP action level were recorded at A2 during the reporting period. The non-compliances were attributed to the new haul road built in the vicinity of the monitoring station which caused increased vehicular activities at that area. The Contractor has increased the frequency of water spraying to keep dust generation to minimum.

Due to the re-alignment of the western boundary, A2 has been moved slightly further west in closer proximity to the Shiu Wing Steel Mill from 29.04.2004.

Water Quality Monitoring.

Water quality in terms of turbidity, dissolved oxygen, suspended solids, temperature, and salinity, was carried out on fourteen occasions at FM1, FM2, FC1 and FC2. Two exceedances to the depth-averaged turbidity limit level were recorded during the reporting period. Fill materials were being transferred from barges when exceedances were detected. However, no discharge from the Fill Bank was observed. Therefore, these exceedances may possibly due to materials lost into the sea during transfer or discharge from nearby shoreline and outfall. The Contractor was reminded to avoid any fill materials lost into the sea and implement all necessary measures to avoid threatening the water quality.

Landscape Audit

Slope surfaces were being hydroseeded in this reporting period. Some unhealthy trees were observed at the buffer tree planting strip. They will be replaced by the Contractor.

Waste Management.

206,000m³ public fill was collected to stockpiling area. 24.69t C&D waste and general refuse were disposed of at WENT Landfill. Chemical waste generated was stored in temporary storage area.

Complaints and Notifications of Summonses and Successful Prosecutions.

No complaints or notification of summonses was received this reported period.

Site Inspections.

Five weekly site inspections were conducted on 1st, 8th, 14th, 22nd and 30th April 2004. Major observations are summarised in the following table.

| Observations | Actions by Contractor | Outcome |
|---|---|---|
| Some drainage channels were blocked with debris and sediment. (1 st April 2004) | Cleaned up the channels. | Drainage channels were cleaned up. (8 th April 2004) |
| Spillage of material into marine water at the tipping hall. (8 th April 2004) | Raised nets to retain material and instructed barges to berth as close to the seawall as possible. | Situation improved. (22 nd April 2004) |
| Dust generation was observed near the tipping hall. (8 th April 2004) | Arranged water trucks to dampen that portion. | Water trucks were arranged to cover that area. (14 th April 2004) |
| Debris was accumulated in the sedimentation facilities. (14 th April 2004) | Removed the debris. | Situation rectified. (22 nd April 2004) |
| Fill materials were stockpiled at the sea frontage. (14 th and 30 th April 2004) | To remove the stockpiles and avoid accumulation. | To be observed in next reporting period. |
| Haul road and worksites were dusty. (14 th , 22 nd , and 30 April 2004) | To increase the frequency of watering and compaction and cover loose surfaces with impervious sheeting. | To be observed in next reporting period. |

An Independent Environmental Checker (IEC) audit was conducted on 14th April 2004 with the Environmental Team. Major observations are summarized in the following table.

| Observations | Actions by Contractor | Outcome |
|--|--|--|
| Splashing generated from wet soils during the transfer to the barge at the tipping hall has the potential of splashing into the sea. | Raised nets to retain material and instructed barges to berth as close to the seawall as possible. | Situation improved. (22 nd April 2004) |
| The desilting chamber at the seafront was filled with debris. | Removed the debris. | Situation rectified. (22 nd April 2004) |
| The slopes of the stockpiles at the seafront were on top of the sea blocks, it is possible for these stockpiles being washed into the sea. | To remove the stockpiles and avoid accumulation and keep the slopes of the stockpiles below the top of the sea blocks. | To be observed in next reporting period. |
| Debris was observed on the sea blocks. | Cleaned up the debris. | To be observed in next reporting period. |

Future Key Issues.

The tentative works activities, predicted impacts and areas of environmental concern for the following month are summarised in the following table.

| Works Activities | Predicted Impacts | Proposed Mitigation Measures |
|--|-------------------|--|
| Public filling operation. | - Dust - Water | - Dampening of fill materials. - Avoid stockpiling fill materials near seafront. - Avoid spillage of fill materials into the marine water. |
| Operation of tipping hall for unloading public fill into barges. | - Dust - Water | - The tipping halls shall be top and 3-sides enclosed. - Avoid spillage of fill materials into the marine water. |

1. INTRODUCTION.

1.1 Background.

Stanger Asia Ltd. has been commissioned by the Penta-Ocean Construction Co. Ltd. to provide an Environmental Team (ET) to monitor air and water quality and audit landscape works for Contract No.CV/2002/13. The team is to take a pro-active role in all issues, which may be of environmental concern during the establishment, operation and decommissioning phases of the Fill Bank at Tuen Mun Area 38.

The Independent Environmental Checker (IEC) appointed for this project is Materialab Consultants Ltd.

In this report, the air and water quality monitoring works and landscape audit conducted for the April 2004 will be detailed and reviewed. All monitoring works were carried out in accordance to “*Agreement No, PW 01/2002 Project Profile for Fill Bank at Tuen Mun Area 38, Environmental Monitoring and Audit Manual*”.

1.2 Report Structure.

The purpose of this report is to detail and review the air and water quality monitoring works and landscape audit undertaken during April 2004. The impact forecast for the next reporting month and the schedules of monitoring works for the following month is also given.

The report follows the format given below:

| | |
|------------|--|
| Section 1 | Introduction and background information to the content of this report. |
| Section 2 | This section gives the information of the project. |
| Section 3 | This section summarises all the environmental permits and licenses. |
| Section 4 | Summary of the EM&A requirements is presented. |
| Section 5 | This section details the implemented mitigation measures. |
| Section 6 | Details monitoring results. |
| Section 7 | Audit the monitoring results. |
| Section 8 | The status for solid and liquid waste management for the site is overviewed. |
| Section 9 | Complaints, notifications of summons and successful prosecutions are summarized. |
| Section 10 | This section gives the predicted impacts of the construction activities. |
| Section 11 | This section gives a conclusion in relation to all monitoring activities. |

2. PROJECT INFORMATION.

2.1 Site Description.

The works mainly comprise the construction of temporary storm water system, setting up of C&D material loading/unloading facilities, setting up/ refurbishing site facilities, stockpiling of 4.9 million m³ of public fill, and decommissioning of the temporary fill bank.

The site layout plan is shown in Figure 2.1.

2.2 Project Organization.

Mr. L.M. Chan is the Engineer's Representative for the Civil Engineering Department, Government of the HKSAR. (Tel: 2762 5602, Fax: 2714 0113).

The Independent Environmental Checker (IEC) for this project is headed by Mr. Joseph Poon - Manager of Materialab Consultants Ltd. (Tel: 2450 8238, Fax: 2450 6138).

Mr. Lok Wah Fung is the Site Agent for Penta-Ocean Construction Co., Ltd. (Tel: 2491 1584, Fax: 2496 0433).

The Environmental Team (ET) for the project is Stanger Asia Ltd. The team is headed by Mr Chris Shenfield – Senior Environmental Scientist. (Tel: 2682 1203, Fax: 2682 0046).

The Organization Chart with the key personnel contacts names and telephone numbers is given in Appendix I.

2.3 Construction Programme.

The overall construction programme is given in Appendix IX. Details of the construction activities are listed below.

- Site clearance;
- Construction of storm water drainage system;
- Stockpiling of 4.9 million m³ of public fill;
- Construction of landscape works; and
- Removal of stockpiled public fill.

3. ENVIRONMENTAL PERMITS AND LICENSES.

The summary of the status of all environmental permits, licenses and notification for this project as at April 2004 is summarized in the following table.

Table 3.1 Summary of the Environmental Permits and Licenses

| Description | Licence/Permit No. | Date of Issue | Date of Expiry | Status |
|---|----------------------|---------------|----------------|------------|
| Environmental Permit | EP-153/2003 | 13-Feb-03 | -- | Superseded |
| Registration of Chemical Waste Producer | WPN5296-421-P2800-03 | 05-Aug-03 | -- | Issued |
| Amended Environmental Permit | EP-153/2003/A | 30-Oct-03 | -- | Issued |
| Construction Noise Permit | GW-TW0385-03 | 10-Nov-03 | 14-May-04 | Issued |

4. SUMMARY OF EM&A REQUIREMENTS.

4.1 Air Quality.

Monitoring Location.

The project has two designated locations (A1 & A2) for the monitoring of air quality. A1 is a fixed location in the vicinity of the site office to monitor the TSP levels at River Trade Terminal and A2 is a movable location to the western boundary of the site that is designed to move as works progress. Due to the re-alignment of the western boundary, A2 has been moved slightly further west in closer proximity to the Shiu Wing Steel Mill from 29.04.2004. The air monitoring locations are shown in Figure 4.1 and 4.1a.

Table 4.1 Coordinates of Air Quality Monitoring Stations

| Station | HK Metric Grid – Easting | HK Metric Grid - Northing |
|---------|--------------------------|---------------------------|
| A1 | 811368 | 825593 |
| A2 | 810812* | 825096* |

* - Coordinates of present location.

Methodology

Measurement of 24-hour and 1-hour TSP levels were carried out in accordance to the high volume sampling method as set out in the Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50). When positioning the high volume samplers, the following requirements have been observed:

- a horizontal platform with appropriate support to secure the high volume sampler against gusty wind, should be provided;
- horizontal distance between the high volume samplers and an obstacle, such as buildings, must be at least twice the height of the obstacle protruding above the high volume samplers;
- a minimum separation of 2 m should be provided from walls, parapets, and penthouses for rooftop high volume samplers;

- a minimum separation of 2 m should be provided from any supporting structure measured horizontally;
- there should not be any furnace or incinerator flues nearby;
- there should be unrestricted airflow around the high volume samplers;
- a minimum separation of 20 m should be provided from the dripline;
- any wire fence and gate employed to protect the high volume samplers should not cause any obstruction during monitoring.

All relevant data including temperature, pressure, weather conditions, elapsed-timer meter reading for the start and finish of the sampling period, identification and weight of the filter paper, and other special phenomena were recorded.

Monitoring Equipment and Calibration Details.

Andersen GMW Model GS2310 high volume samplers were used to carry out the monitoring of 24-hour and 1-hour TSP. The high volume sampler is in compliance with the specifications as listed in the Environmental Schedule, given below:

- 0.6 – 1.7 m³/min (20-60 SCFM) adjustable flow range;
- equipped with a timing / control device with 5 minutes accuracy over 24 hours operations;
- installed with elapsed-time meter with 2 minutes accuracy over 24 hours operations;
- capable of providing a minimum exposed area of 406 cm² (63 in²);
- flow control accuracy: 2.5% deviation over 24-hr sampling period;
- equipped with shelter to protect the filter and sampler;
- incorporated with an electronic mass flow rate controller or other equivalent devices;
- equipped with a flow recorder for continuous monitoring;
- provided with peaked roof inlet, incorporated with manometer;
- able to hold and seal the filter paper to the sampler housing at horizontal position;
- easy to change filter; and
- capable of operating continuously for 24-hr period.

The high volume sampler is calibrated at bi-monthly intervals. The calibration kit (Andersen Model G2535) comprising pressure plates and a transfer standard is traceable to the internationally recognized standard. Calibration records for the high volume sampler is given in Appendix II of this report.

Laboratory Measurement.

Laboratory measurements were carried out in Stanger Asia Ltd. own HOKLAS accredited laboratory with constant temperature and humidity control, and equipped with necessary measuring and conditioning instruments.

Clean filter papers of size 8"x10" with no pinholes were labelled before sampling. They were conditioned in a dessicator with less than 50% relative humidity for over 24 hours and pre-weighed before use for sampling.

After sampling, the filter papers loaded with dust were kept in a clean and tightly sealed plastic bag. The filter papers were then returned to the laboratory for reconditioning in the dessicator with less than 50% relative humidity followed by accurate weighing on an electronic balance regularly calibrated against a traceable standard and readable to 0.1 mg.

Stanger Asia Ltd. operates comprehensive quality assurance and quality control programmes. For QA/AC procedures, all filters were equilibrated and weighed repeatedly until the difference of two consecutive results was less than 0.5 mg.

Monitoring Parameters Frequency.

Table 4.2 Air Quality Monitoring Frequency

| Monitoring Locations | Parameter | Frequency |
|----------------------|-----------|-------------------------------|
| A1 & A2 | 24-hr TSP | Once in every six days |
| | 1-hr TSP | Three times in every six days |

Action and Limit Levels.

The Action levels for air quality monitoring were established from the impact monitoring data of Contract No. CV/2000/01 prior to the commencement of the fill bank utilising the criteria laid out in *section 4.7* of the EM&A Manual for the project. The Limit levels for air quality monitoring has been set in line with statutory guidelines for air quality in Hong Kong. Action and Limit levels for both 24-hour and 1-hour TSP are given in the following table.

Table 4.3 Action and Limit Levels for the Project

| Parameter Monitored | Action Level, $\mu\text{g}/\text{m}^3$ | Limit Level, $\mu\text{g}/\text{m}^3$ |
|---------------------|--|---------------------------------------|
| 1-hour TSP | 344 | 500 |
| 24-hour TSP | 192 | 260 |

4.2 Water Quality.

Monitoring Locations.

The EM&A Manual produced for this project has proposed two monitoring stations (FM1 & FM2) and two control stations (FC1 & FC2) for the carrying out of water quality monitoring. Control Station FC1 will act as upstream control station for the mid-ebb tide with control station FC2 acting as upstream control stations for the mid-flood tide.

The designated monitoring stations are shown in Figure 4.2.

Methodology.

Measurements are taken at three water depths, namely 1m below water surface, mid-water and 1m above seabed at both mid-flood and mid-ebb tides, except where the water depth less than 6m, when the mid-depth station may be omitted. Should the water depth have been less than 3m, only the mid-depth was monitored.

Two measurements of turbidity, dissolved oxygen (mg/L), dissolved oxygen (% saturation) and temperature at each depth of each station is taken. The probes are removed from the water after the first measurement and then redeployed for the second measurement. If the difference between in value between the first and second reading of each set is more than 25% of the value of the first reading, the readings are discarded and further readings taken. Replicate samples of suspended solids measurements are taken at each depth and at each water quality monitoring and control station. The samples are kept in a chilled condition during delivery to the laboratory and before commencement of analysis. For the purpose of evaluating the water quality, all values for suspended solids and turbidity shall be depth-averaged.

During monitoring works the following shall also be recorded:

- monitoring location;
- depth of water;
- time;
- weather conditions including ambient temperature;
- water temperature;

Monitoring Equipment.

The following equipment was employed for routine water quality monitoring.

- Dissolved Oxygen meter: YSI model 58 with stirrer
- Turbidity meter: Hach 2100P
- Echo sounder: Hummingbird 100SX
- Water sampler: Kahlisco 135WB203
- GPS receiver: Trimble NT2002D
- Thermometer: YSI model 58

Monitoring Equipment Calibration Details.

All on-site monitoring equipment was calibrated three-monthly at Stanger Asia's HOKLAS accredited laboratory. An on-site calibration check was carried out prior to the taking of measurements in accordance with standard water quality monitoring procedures.

Equipment calibration details were given in Appendix II.

Laboratory Analysis.

The laboratory measurements of suspended solids were carried out at Stanger Asia Limited, a HOKLAS accredited laboratory in accordance with Method No. 2540D 17th Edition of APHA.

Stanger Asia operates a comprehensive quality assurance and quality control programmes for QA/AC procedures in accordance with the requirements of HOKLAS accreditation, all filters were equilibrated and weighted repeatedly until the difference of two consecutive results is less than 0.5 mg.

Monitoring Parameters and Frequency.

Table 4.4 Water Quality Monitoring Frequency

| Monitoring Locations | Monitoring Parameters | Frequency | Requirements |
|--|--|----------------------|---|
| Designated Control Stations: FC1 & FC2. | Temperature, Salinity, Dissolved Oxygen, | Three days per week. | At three depths during mid-ebb and mid-flood tides. |
| Designated Monitoring Stations: FM1 & FM2. | Turbidity, Suspended Solids. | | |

Action and Limit Levels.

The Action and Limit levels for water quality monitoring were established from the impact monitoring data of Contract No. CV/2000/01 prior to the commencement of the fill bank utilising the criteria laid out in *section 6.8* of the EM&A Manual for the project.

Table 4.5 Action and Limit Level for Water Quality

| Parameter | Action level | Limit level |
|--|---|---|
| Dissolved Oxygen in mg/L. | | |
| Surface & Middle | <4.78mg/L | <4mg/L |
| Bottom. | <4.16mg/L | <2mg/L |
| Suspended Solids (SS) in mg/L (depth-averaged) | >120% of upstream control station's SS at the same time of the same day. | >130% of upstream control station's SS at the same tide of the same day . |
| Turbidity (Tby) in NTU | >120% of upstream control station's Tby at the same tide of the same day. | >130% of upstream control station's Tby at the same tide of the same day. |

All the figures given in the table are used for reference only and the EPD may amend the figures whenever necessary.

4.3 Event and Action Plans.

The Event and Action Plans for air and water are attached in Appendix III of this report.

5. IMPLEMENTATION STATUS OF ENVIRONMENTAL MITIGATION MEASURES.

The contractor implemented various environmental mitigation measures as recommended in the Project Profile and Environmental Permit. The implementation status is attached in Appendix IV and summarised as follows:

- Wheel washing facilities were provided at the exit point of the site and the wheel washing bay was cleared regularly.
- Slopes were compacted as far as practicable.
- Site accesses were covered with concrete.

- Waste collection points were maintained and cleaned on a regular basis.
- Hoarding was erected along Lung Mun Road and near River Trade Terminal.
- Oil drums were placed in drip trays.
- Water trucks were in operation.
- Buffer trees were planted.
- Speed limit warning signs were posted.
- Hydroseeding was in progress.

6. MONITORING RESULTS.

6.1 Completed Monitoring Works.

Table 6.1 gives the completed monitoring works for the reported period.

Table 6.1 Completed Monitoring Works for April 2004

| Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday |
|--------|--|--|---|---|-------------|---|
| | | | | April 1 | 2 | 3 |
| | | | | WQM (Ebb: 10:57) (Flood: 15:38) Site Inspection | | WQM (Ebb: 11:59) (Flood: 17:35) |
| 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | | WQM (Ebb: 13:34) (Flood: 07:27) 24 – hr TSP 1- hr TSP | | WQM (Ebb: 14:52) (Flood: 08:23) 1 – hr TSP Site Inspection | 24 – hr TSP | WQM (Ebb: 16:33) (Flood: 09:25) |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| | | WQM (Ebb: 20:22) (Flood: 07:40) | Site Inspection 24 – hr TSP 1- hr TSP | WQM (Ebb: 10:58) (Flood: 15:59) | | WQM (Ebb: 12:06) (Flood: 17:49) 24 – hr TSP* 1- hr TSP* |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| | | WQM (Ebb: 13:34) (Flood: 07:12) 24 – hr TSP 1 – hr TSP | | WQM (Ebb: 14:36) (Flood: 07:53) Site Inspection | | WQM (Ebb: 15:44) (Flood: 08:30) 1- hr TSP* |
| 25 | 26 | 27 | 28 | 29 | 30 | |
| | WQM (Ebb: 17:11) (Flood: 08:55) 24 – hr TSP 1 – hr TSP | | WQM (Ebb: 19:19) (Flood: 06:45) | WQM (Ebb: 10:18) (Flood: 15:15) 24 – hr TSP 1 – hr TSP 1- hr TSP* Site Inspection Landscape Audit | | |

- Notes:
1. 24 –hr TSP (monitored once every 6 days) at monitoring locations A1 and A2.
 2. 1 hour TSP (monitored three times every six days when highest level of dust generation expected) at monitoring locations A1 and A2.
 3. WQM - water quality monitoring three times per week, on mid-flood and mid-ebb tides. Days of monitoring to be separated by at least 36 hours. Monitoring locations FC1, FM1, FM2 & FC2.
 4. Site inspections to be carried out once per week.
 5. Auditing of landscape works to be carried out once per month.
- * Ad-hoc monitoring at monitoring location A2.

6.2 Air Quality Monitoring.

Impact monitoring of 24-Hour TSP was conducted on six occasions at A1 and on seven occasions at A2, with the monitoring of 1-Hour TSP being conducted on eighteen occasions at A1 and on twenty-one occasions at A2 this reported period.

The monitoring records for 24-hour and 1-hour TSP are given in the following table. Details of monitoring results are given in Appendix V. The results are presented graphically in Figures 6.1 and 6.2.

Table 6.2 Results of 24-hour TSP Monitoring

| Date | A1, $\mu\text{g}/\text{m}^3$ | Exceedance (Y/N) | A2, $\mu\text{g}/\text{m}^3$ | Exceedance (Y/N) |
|--------------|------------------------------|------------------|------------------------------|------------------|
| 06/04/2004 | 85 | N | 245 | Y (Action) |
| 09/04/2004 | 93 | N | 181 | N |
| 14/04/2004 | 81 | N | 157 | N |
| 17/04/2004 | --- | --- | 72 | N |
| 20/04/2004 | 131 | N | 164 | N |
| 26/04/2004 | 82 | N | 182 | N |
| 30/04/2004 | 133 | N | 140 | N |
| Action Level | 192 $\mu\text{g}/\text{m}^3$ | | | |
| Limit Level | 260 $\mu\text{g}/\text{m}^3$ | | | |

Table 6.3 Results of 1-hour TSP Monitoring

| Date | A1, $\mu\text{g}/\text{m}^3$ | Exceedance (Y/N) | A2, $\mu\text{g}/\text{m}^3$ | Exceedance (Y/N) |
|--------------|------------------------------|------------------|------------------------------|------------------|
| 06/04/2004 | 246 | N | 321 | N |
| 06/04/2004 | 214 | N | 324 | N |
| 06/04/2004 | 204 | N | 699 | Y (Limit) |
| 08/04/2004 | 181 | N | 211 | N |
| 08/04/2004 | 26 | N | 343 | N |
| 08/04/2004 | 139 | N | 258 | N |
| 14/04/2004 | 107 | N | 121 | N |
| 14/04/2004 | 173 | N | 331 | N |
| 14/04/2004 | 78 | N | 301 | N |
| 17/04/2004 | --- | --- | 321 | N |
| 20/04/2004 | 94 | N | 322 | N |
| 20/04/2004 | 150 | N | 532 | Y (Limit) |
| 20/04/2004 | 175 | N | 906 | Y (Limit) |
| 24/04/2004 | --- | --- | 799 | Y (Limit) |
| 26/04/2004 | 237 | N | 775 | Y (Limit) |
| 26/04/2004 | 162 | N | 580 | Y (Limit) |
| 26/04/2004 | 134 | N | 633 | Y (Limit) |
| 30/04/2004 | --- | --- | 304 | N |
| 30/04/2004 | 103 | N | 247 | N |
| 30/04/2004 | 128 | N | 253 | N |
| 30/04/2004 | 197 | N | 281 | N |
| Action Level | 344 $\mu\text{g}/\text{m}^3$ | | | |
| Limit Level | 500 $\mu\text{g}/\text{m}^3$ | | | |

Wind speed and direction data from the wind station is given in Appendix XI.

6.3 Water Quality Monitoring.

Water monitoring was carried out on thirteen occasions at FM1, FM2, FC1 and FC2.

Results for water quality monitoring are summarised in the following tables. Details of monitoring results are presented in Appendix VI. Graphical presentations of the results are shown in Figure 6.3 – Figure 6.10.

Table 6.4 Summary of Water Quality Monitoring Data

| Sample Location | Surface & Middle Averaged Dissolved Oxygen (Range), mg/L | Bottom Averaged Dissolved Oxygen (Range), mg/L | Depth Averaged Turbidity (Range), NTU | Depth Averaged Suspended Solids (Range), mg/L |
|-----------------|--|--|---------------------------------------|---|
| FM1 | 7.06 (5.27-7.77) | 6.87 (5.35-7.54) | 9.86 (3.11-27.10) | 12.8 (6.8-36.5) |
| FM2 | 7.12 (5.54-7.80) | 6.94 (5.58-7.54) | 9.72 (3.86-27.55) | 12.5 (6.7-33.7) |
| FC1 | 7.08 (5.97-7.78) | 6.84 (5.28-7.42) | 10.58 (4.12-45.33) | 14.8 (7.5-67.7) |
| FC2 | 7.17 (6.26-7.81) | 6.95 (5.35-7.51) | 10.06 (4.28-30.42) | 13.0 (7.7-29.3) |

7. AUDIT REPORT.

7.1 Air Quality Monitoring.

In this reporting period, no exceedance to set action and limit levels for either 24 or 1-Hour TSP monitoring was recorded at air monitoring station A1. However, seven non-compliances to the 1-hour TSP limit level and one non-compliance to the 24-hour TSP action level were recorded at A2 during the reporting period. The non-compliances were attributed to the new haul road built in the vicinity of the monitoring station which caused increased vehicular activities at that area. The Contractor has increased the frequency of water spraying to keep dust generation to minimum.

7.2 Water Quality Monitoring.

There were two exceedances to the depth-averaged turbidity limit level in this reported period. Details of exceedances are presented in the water quality monitoring data in Appendix VI.

These exceedances were reported on 20.04.2004 during flood tide. Fill materials were being transferred from barges when exceedances were detected. However, no discharge from the Fill Bank was observed. Therefore, these exceedances may possibly due to materials lost into the sea during transfer or discharge from nearby shoreline and outfall. The Contractor was reminded to avoid any fill materials lost into the sea and implement all necessary measures to avoid threatening the water quality.

7.3 Site Inspections.

Five weekly site inspections were conducted on 1st, 8th, 14th, 22nd and 30th April 2004. Observations by ET, action by the Contractor and outcome are summarised in the following table.

Table 7.1 Summary of Findings, Actions and Outcomes of Site Inspection by ET

| Observations | Actions by Contractor | Outcome |
|---|---|---|
| Some drainage channels were blocked with debris and sediment. (1 st April 2004) | Cleaned up the channels. | Drainage channels were cleaned up. (8 th April 2004) |
| Spillage of material into marine water at the tipping hall. (8 th April 2004) | Raised nets to retain material and instructed barges to berth as close to the seawall as possible. | Situation improved. (22 nd April 2004) |
| Dust generation was observed near the tipping hall. (8 th April 2004) | Arranged water trucks to dampen that portion. | Water trucks were arranged to cover that area. (14 th April 2004) |
| Debris was accumulated in the sedimentation facilities. (14 th April 2004) | Removed the debris. | Situation rectified. (22 nd April 2004) |
| Fill materials were stockpiled at the sea frontage. (14 th and 30 th April 2004) | To remove the stockpiles and avoid accumulation. | To be observed in next reporting period. |
| Haul road and worksites were dusty. (14 th , 22 nd , and 30 April 2004) | To increase the frequency of watering and compaction and cover loose surfaces with impervious sheeting. | To be observed in next reporting period. |

The Independent Environmental Checker (IEC) conducted at audit on 14th April 2004. The major observations were summarized in the following table.

Table 7.2 Summary of Findings, Actions and Outcomes of Site Inspection by IEC

| Observations | Actions by Contractor | Outcome |
|--|--|---|
| Splashing generated from wet soils during the transfer to the barge at the tipping hall has the potential of splashing into the sea. | Raised nets to retain material and instructed barges to berth as close to the seawall as possible. | Situation improved. (22 nd April 2004) |
| The desilting chamber at the seafront was filled with debris. | Removed the debris. | Situation rectified. (22 nd April 2004) |
| The slopes of the stockpiles at the seafront were on top of the sea blocks, it is possible for these stockpiles being washed into the sea. | To remove the stockpiles and avoid accumulation and keep the slopes of the stockpiles below the top of the sea blocks. | To be observed in next reporting period. |
| Debris was observed on the sea blocks. | Cleaned up the debris. | To be observed in next reporting period. |

7.4 Landscape and Visual.

A landscape audit was conducted on 30th April 2004. Hoarding has been erected along Lung Mun Road and the River Trade Terminal. Buffer trees were planted along the northern perimeter of the site to further soften the landscape. Slope surfaces of the fill bank were being hydroseeded and lighting was sit to minimize night-time glare. Some unhealthy trees were observed at the buffer tree planting strip. They will be replaced by the Contractor.

8. WASTE MANAGEMENT.

206,000m³ public fill was collected to stockpiling area. 24.69t C&D waste and general refuse were disposed of at WENT Landfill. Chemical waste generated was stored in temporary storage area.

9. COMPLAINTS, NOTIFICATIONS OF SUMMONSES AND SUCCESSFUL PROSECUTIONS.

No complaint was received this month. Complaint Log is attached in Appendix VII. Cumulative statistics on complaints, notifications of summonses and successful prosecutions are attached in Appendix VIII.

10. FUTURE KEY ISSUES.

The following are the scheduled construction activities for the next reported period. Scheduled monitoring activities for the following month are given in Appendix IX.

Table 10.1 Works Programme for May 2004

| Works Activities | Predicted Impacts | Proposed Mitigation Measures |
|--|--------------------------|--|
| Public filling operation. | - Dust - Water | - Dampening of fill materials. - Avoid stockpiling fill materials near seafront. - Avoid spillage of fill materials into the marine water. |
| Operation of tipping hall for unloading public fill into barges. | - Dust - Water | - The tipping halls shall be top and 3-sides enclosed. - Avoid spillage of fill materials into the marine water. |

11. CONCLUSION.

All results for the air quality monitoring conducted at monitoring station A1 this month were acceptable. However, seven non-compliances to the 1-hour TSP and one non-compliance to 24-hour TSP were recorded at monitoring station A2. The Contractor has increased the frequency of water spraying to keep dust generation to minimum.

In relation to the monitoring of water quality, there were two limit level exceedances during the reporting period. Since no discharge from the Fill Bank was observed, these exceedances may possibly due to materials lost into the sea during transfer or discharge from nearby shoreline and outfall. The Contractor is reminded to implement all necessary mitigation measures to avoid deteriorating the water quality.

No specific observation was reported from landscape audit.