



ENVIRONMENTAL IMPACT ASSESSMENT

Environmental Monitoring and Audit Report

**Hong Kong Cement/Concrete Batching Plant
and
Material Storage Facilities
at
North-West Tsing Yi Island**

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1. INTRODUCTION

As stated in the Study Brief for a comprehensive Environmental Impact Assessment (EIA) study for the proposed cement depots and concrete batching plants at TYTL 119, North-West of Tsing Yi Island, an Environmental Monitoring and Audit Report (EM&AR) is required. This EM&AR is intended to streamline the dust monitoring and audit requirements and to provide guidance and reference to the plant operators on the requirements in the dust monitoring and audit matters.

2. OBJECTIVES

Dust, or collectively called total suspended particulates (TSP), is the most concerned air pollutants arising from the operational procedures of the cement works. The EIA study concluded that with the incorporation of best practicable means of dust control measures and good site management, the cumulative dust level at the sensitive receivers will be within acceptable level and shall be below the Air Quality Objectives. In order to observe the effectiveness of these dust control measures, some sorts of dust monitoring exercise are required. Environmental monitoring and the associated auditing is to ensure that any deteriorated air quality could be readily recognized and to take any timely rectification measures to protect the health and well-being of the society.

3. MONITORING METHODOLOGY

3.1 Monitoring Method

To avoid any inconsistency in conducting the TSP monitoring exercise, standard high volume sampling method as set out in the *United State Environmental Protection Agency (USEPA), Title 40, Part 50 Appendix B, United States Code of Federal Regulations (CFR) (1989 or later edition) "Reference Method for the Determination of Suspended particulate matter in the Atmosphere (High-Volume Method)"* should be followed. The method provides a measurement of the mass concentration of TSP in ambient air.

3.2 High Volume Sampler

High volume sampler (HVS) in compliance with the specifications as set out in the Appendix I should be used. Recognised primary standard should be provided for regular calibration. Sufficient number of high volume air samplers with appropriate calibration kit should be provided for the baseline monitoring, regular impact monitoring, and ad hoc monitoring for the 24-hr measurements of the identified monitoring stations. The HVS should be equipped with electronic mass flow controller and be calibrated against traceable standard at regular interval. All the equipment, calibration kit, filter papers, etc. should be clearly labeled.

3.3 Selection of Monitoring Site

In selection of the suitable locations for the monitoring exercise the following criteria shall be followed as far as practicable:

- at the site boundary or such positions close to the major dust emission source;
- close to the sensitive receptors; and

- take into account the prevailing meteorological conditions.

The monitoring station should also be provided with other basic requirements in the early stage such as continuous stable power supply, security set up, and laboratory support. A preliminary location for the dust monitoring exercise and the location is shown in Figure 3-1.

3.4 Positioning of Sampler

When positioning the sampler, the following points should be noted :

- A horizontal platform with appropriate supporting to secure the samplers against gusty wind should be provided;
- No two samplers should be placed less than 2 meters apart;
- Distance between the samplers and the obstacle, such as buildings, must be at least twice the height of the obstacle protruding above the samplers;
- A minimum of 2 meters of separation from walls, parapets, and penthouses is required for rooftop samplers;
- A minimum of 2 meters of separation from any supporting structure measured horizontally;
- No furnace or incinerator flues should be nearby;
- Must be unrestricted airflow around the sampler;
- Must be more than 20 meters from the dripline; and
- Any wire fence and gate to protect the sampler should not cause any obstruction during monitoring.

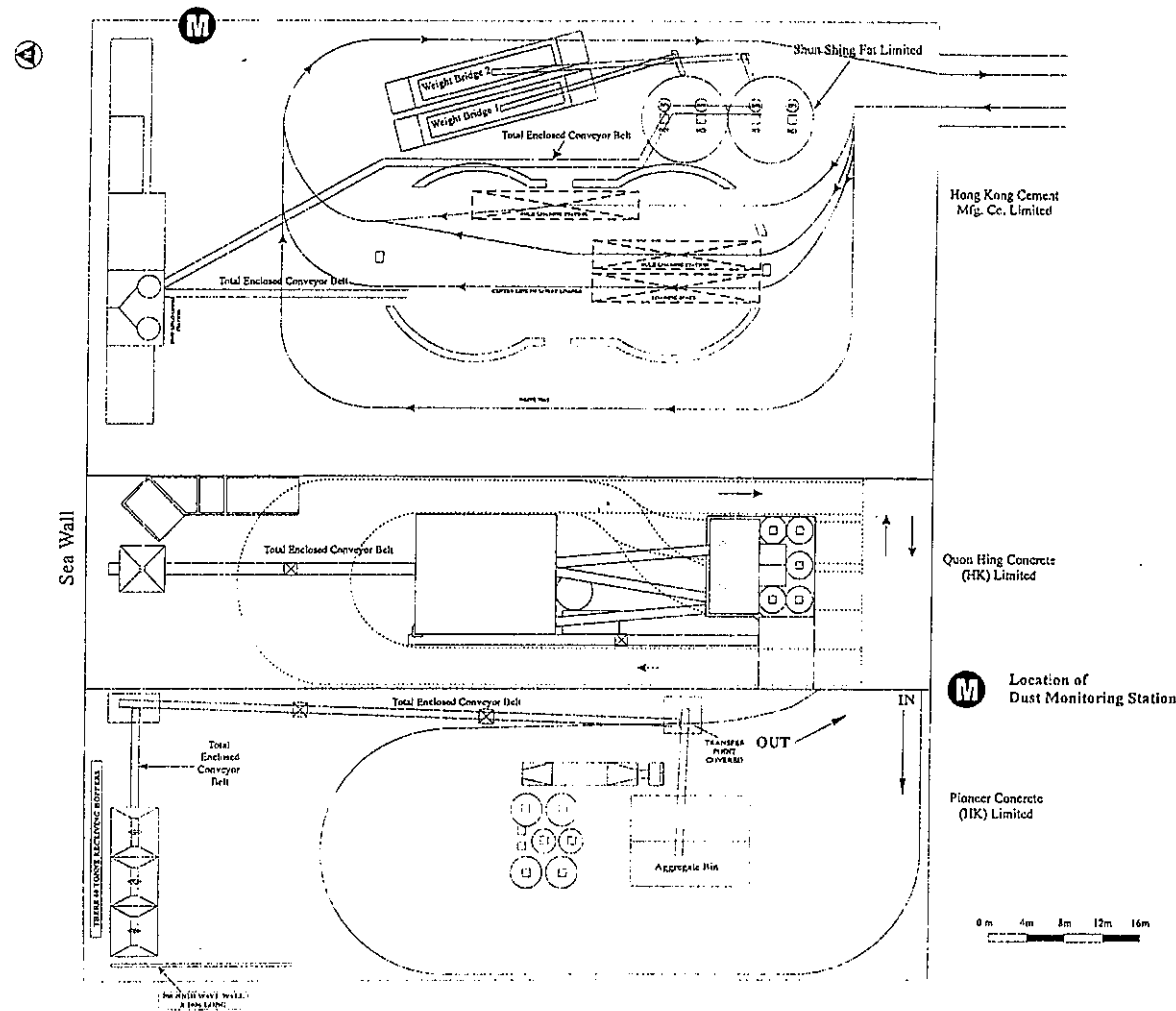
3.5 Calibration Requirement

- Initial calibration of dust monitoring equipment should be conducted upon installation and thereafter in a bi-monthly interval;
- Transfer standard should be traceable to the internationally recognised primary standard and be calibrated annually; and,
- The calibration data should be properly documented for future reference. All the data should be converted into standard temperature and pressure condition.

3.6 Data Collection

- All relevant data including temperature, pressure, weather conditions, elapsed-time meter reading for the start and stop of the sampler, identification and weight of the filter paper, and other special phenomena and work progress of the concerned site etc., should be recorded down in the field in details. A sample data sheet is attached at Appendix II;
- One form per sampling occasion should be used for recording;
- Flow-rate of the sampler before and after the sampling exercise with the filter in position should be verified to be constant and be recorded down in the data sheet; and
- All the data/record should be kept for additional 6-month.

Figure : 3-1



TITLE : Location of the Proposed Monitoring Station

PROJECT : EIA For Cement and Concrete Batching Plant at Tsing Yi Town Lot 119

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3.7 Laboratory Measurement / Analysis

- A clean laboratory with constant temperature and humidity controlled, and equipped with necessary measuring and conditioning instrument to handle the dust samples collected should be available for sample analysis and equipment calibration/maintenance;
- Filter paper of size 8"x10" should be labeled before sampling. It should be a clean filter paper with no pin hole, and should be conditioned in a humidity controlled chamber for over 24-hr and be pre-weighed before use for the sampling;
- After the sampling, the filter paper loaded with dust should be kept in a clean and tightly sealed plastic bag. The filter paper is then returned to the laboratory for reconditioning in the humidity controlled chamber followed by accurate weighing by an electronic balance with readout down to 0.1mg. The balance should be calibrated against traceable standard regularly; and
- Additional conditioned and weighed filter papers should be ready for immediate action whenever necessary.

3.8 Reporting / Responsibilities

- The monitoring team to conduct dust monitoring should be properly trained;
- Environmental Monitoring and Audit (EM&A) Manual/Inception Report should be prepared and submitted to EPD on a 3-monthly basis; and
- All the exceedances in air quality standards events and any remedial work, among other information, should be included in the report.

4. MONITORING REQUIREMENTS

4.1 Baseline monitoring Schedule

The baseline daily 24-hr monitoring should be carried out at the identified monitoring station for at least two consecutive weeks prior to the commissioning of the cement works. There should not be any construction or dust generation activities in the vicinity of the stations during baseline monitoring.

4.2 Regular impact monitoring

In regular impact monitoring, the sampling frequency of at least once for every six-day should be strictly observed at the monitoring station for 24-hr monitoring. Specific time to start and stop the 24-hr TSP monitoring should be clearly defined and be strictly followed by the operator.

4.3 Non-compliance impact monitoring

In case of non-compliance with the air quality criteria, more frequent monitoring exercise as specified in the Action Plan in Section 6 should be conducted within 24 hours. This additional monitoring should be continued until the excessive dust emission or the deterioration in air quality problem is rectified.

5. QUALITY CONTROL

- Field staff are required to record observations and events of the concerned site and the vicinity for any unusual phenomenon in the data form with date, time, site identification, filter number, name of operator, etc..
- Custody Transfer documents should be used to ensure that a complete chain of custody exists from the point of sampling through the analysis to final disposal. At each point in the chain one individual is identified as responsible for the sample, until the custody transfer document is signed by another individual, who then assumes responsibility. In this way the integrity of the samples can be ensured.
- All equipment calibration and recalibration exercises should be documented.
- Report of the measurement should be signed by the operator, which should be checked with signature by another staff for result validity. The report is then countersigned by the senior before issuing.
- Data input into the database should be checked against field records prior to being sent to the Officer responsible to the audit. In case of error or queries are encountered, the data should be marked to indicate potential degradation of quality until explainable source(s) of such variation is identified.

6. ACTION PLAN

In order to rectify any exceedances of the pre-set air quality limit, the action plan as stipulated below should be strictly observed in order to avoid any further deterioration of air quality. For the purpose of early initiation of rectification measures, 3 levels of standards are proposed, namely, the trigger, action, and target levels.

6.1 Trigger / Action / Target Levels

The Trigger, Action, and Target Levels are defined as :-

- Trigger :- 30 % mark up of the baseline monitoring data. The levels beyond which there is an indication of deteriorating ambient environmental quality.
- Action :- Average value of the Trigger and Target levels. The levels beyond which appropriate remedial actions is necessary to prevent the environmental quality from going beyond the target limits.
- Target :- Air Quality Objective (AQO) value of the corresponding pollutants. The levels beyond which the healthy of the public will be at risk.

Table 6-1 Action Plan for the TSP Monitoring

Event	Action by Cement Works Operators
Trigger level exceeded for one sample	<ul style="list-style-type: none"> • Repeat measurement as soon as possible • Identify source
Trigger level exceed for more than one consecutive sample	<ul style="list-style-type: none"> • Repeat measurement as soon as possible and notify EPD immediately • Identify source and impose necessary mitigation measures
Action level exceed for one example	<ul style="list-style-type: none"> • Repeat measurement as soon as possible and notify EPD immediately • Identify source and impose necessary mitigation measures
Action level exceed for more than one consecutive sample	<ul style="list-style-type: none"> • Repeat measurement as soon as possible and notify EPD immediately • Identify source and review plant, equipment and work procedures • Implement remedial action to dust emission immediately
Target level exceeded for one samples	<ul style="list-style-type: none"> • Repeat measurement as soon as possible and notify EPD immediately • Identify source and review plant, equipment and work procedures • Implement remedial action to dust emission immediately • Provide investigation report which should be sent to EPD as soon as possible

7. CONCLUSION

This EM&AR briefly summaries the guidelines for environmental monitoring and audit to be referenced by the cement works operators. It provides minimum requirements for dust monitoring and audit. An Action Plan for early initiation of rectification measures has been formulated and will be followed by the operators.

Appendix I

Specifications of High Volume Sampler for TSP Monitoring

Specifications of High Volume Sampler for TSP monitoring

- 0.6 - 1.7 m³ / min (20-60 SCFM) adjustable flow range
 - Equipped with a timing / control device with +/- 5 minutes accuracy for 24 hours operation.
 - Installed with elapsed-time meter with +/- 2 minutes accuracy for 24 hours operation.
 - 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.
 - Capable of operating continuously for 24-hour period.
-

Appendix II

Data Sheet for TSP Monitoring

Data Sheet for TSP Monitoring

Monitoring Location		
Details of Location		
Sampler Identification		
Date & Time of Sampling		
Elapsed-time	Start (min.)	
Meter Reading	Stop (min.)	
Total Sampling Time (min.)		
Weather Conditions		
Site conditions		
Initial flow	Pi (mmHg)	
Rate	Ti (°C)	
Qsi	Hi (in.)	
	Qsi (std. m ³)	
Final Flow	Pf (mmHg)	
Rate	Tf (°C)	
Qsf	Hf (in.)	
	Qsf (Std. m ³)	
Average Flow Rate(Std. m ³)		
Total Volume (Std. m ³)		
Filter Identification No.		
Initial Wt. of filter (g)		
Final Wt. of Filter (g)		
Measured TSP Level (ug/m ³)		

	<u>Name & Designation</u>	<u>Signature</u>	<u>Date</u>
Field Operator	: _____	_____	_____
Lab. Staff	: _____	_____	_____
Checked by	: _____	_____	_____

