



HAMERSLEY IRON

A member of the Rio Tinto Group

DUST MANAGEMENT PLAN

2005/2006

DAMPIER PORT OPERATIONS

Version D
September 2005

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1 INTRODUCTION

Hamersley Iron Pty Limited (Hamersley Iron) operates iron ore receiving, processing, stockpiling and exporting facilities at the Parker Point and East Intercourse Island port facilities, located adjacent to the township of Dampier on the Pilbara coast of Western Australia. In 2004, 72.7 million tonnes of iron ore was shipped from the Dampier Port facilities.

Hamersley Iron recognize that operating the port facilities can result in the generation of dust, with the potential to impact on the local environment and community. This document describes Hamersley Iron's strategies for dust management, and details an action plan for the reporting period September 2005 to August 2006.

The Hamersley Iron Dampier Operations Dust Management Plan (DMP) was initially developed in accordance with specific requirements in the 2003-2004 Department of Environment licences for the Parker Point and East Intercourse Island operations. These licences required the DMP to be reviewed and updated on an annual basis. The DMP was first prepared and issued to the Department of Environment in August 2002; this document is the third update to be submitted.

2 OBLIGATIONS

This Dust Management Plan satisfies Department of Environment Licence requirements (licence numbers 4542/9 and 6951/10), and condition 7.7 of Ministerial Statement 000638. Table 1 outlines how these conditions are addressed in the Dust Management Plan.

Table 1. Summary of Compliance with Conditions

Document	Requirement	Section No. and Commentary
Department of Environment Licence Numbers 4542/9 and 6951/10	The licensee is required to update Dust Management Plan, Dampier Operations, August 2003 in consultation with the North West Regional Office, and provide a copy to the Director by 1 September 2005.	This document.
	Condition G2: The licensee shall undertake a review of performance against the current Dampier Operations Dust Management Plan, and provide a report documenting progress to the Director by 31 March each year.	Due on 31 March 2006.
Ministerial Statement Number 638, Condition 7.7	1) identification of potential dust remediation works	Section 4.3.2
	2) commitments to undertake practicable dust remediation works	
	3) timelines to implement practicable dust remediation works	
	4) a review of operational and maintenance procedures to ensure that dust emissions are minimised, including optimising the performance of dust suppression equipment, and where practicable, restricting potentially dusty operations during adverse weather conditions	This action was completed as part of the 2003/2004 Dust Suppression Improvement Plan.
	5) a dust level (PM ₁₀) reduction target on existing dust levels within the town of Dampier, and a plan to achieve the target dust level reduction	Section 4.2
	6) frequent reporting of ambient dust levels to the community	Section 7.2
	7) recording and investigating community complaints	Section 7.2.3
	8) investigation and recording of the cause for all exceedances of the NEPM (for particulates as PM ₁₀) in the town of Dampier	Section 7.1.7 and Section 7.2.4
	9) reporting of dust monitoring, complaints and progress on dust remediation works,	Section 8.2
	10) management of dust levels to protect Aboriginal rock art sites	Hamersley Iron have funded a study by CSIRO through the Department of Industry and Resources into the potential impacts of dust on rock art. Preliminary results of the study are expected to be available in September 2005.

2.1 DUST CRITERIA

Dust is generally assumed to comprise of fine, airborne particles of earth or pollen material. Monitors used to measure dust may also include in their measurement smoke particles, salt, and other aerosols suspended in the air.

Dust or particle monitors have a cut-off for the size range of the particles they collect and measure. Three size ranges are commonly used: 50 μm , 10 μm and 2.5 μm and the particulate matter (PM) measured is abbreviated as PM₅₀, PM₁₀ and PM_{2.5} respectively. PM₅₀ is also referred to as Total Suspended Particulates (TSP).

TSP measurements are associated with the potential for nuisance or loss of amenity. PM₁₀ and PM_{2.5} measurements are associated with the potential for health impacts because particles below these sizes may penetrate the nose and enter the lung.

Two environmental criteria for dust used in Western Australia are outlined in Table 2.

Table 2. Criteria for airborne dust used in Western Australia.

Particle size	Averaging time	Concentration (mg/m ³)	Frequency	Reference
TSP	15 minutes	1000	Not to be exceeded	Kwinana EPP, Area C (residential) ^(a)
	24 hours	90	Desirable not to be exceeded	
	24 hours	150	Not to be exceeded	
PM ₁₀	24 hours	50	Not more than 5 days a year	NEPM for Ambient Air ^(b)
PM _{2.5}	24 hours	25	Goal is to gather sufficient data nationally to facilitate a review of the Advisory Reporting Standards as part of the review of this Measure scheduled to commence in 2005	
	1 year	8		

^(a) Environmental Protection (Kwinana) (Atmospheric Waste) Policy 1992 and Environmental Protection (Kwinana) (Atmospheric Waste) Regulations 1992.

^(b) National Environment Protection Council (NEPC), 1998, National Environment Protection Measure for Ambient Air Quality, 26 June 1998 and Variation dated 23 May 2003.

3 MISSION STATEMENT

Hamersley Iron is committed to continuously reducing levels of fugitive dust generated by the East Intercourse Island and Parker Point port facilities.

Hamersley Iron is sensitive to the concerns of Dampier residents regarding the levels of dust experienced in the Dampier township, and will ensure systems that facilitate communication with Dampier residents are maintained.

4 DUST MANAGEMENT STRATEGY

The Dust Management Strategy is intended to provide a reproducible and consistent approach for managing dust generated by the Hamersley Iron Port Operations, with the aim of achieving the Hamersley Iron Mission Statement.

On an annual basis, the Dust and Water Management Team¹ (DWMT) reviews the dust risks, outlines objectives and targets to address the significant risks, meet policy commitments, legal and other requirements, and stakeholder concerns, and then commits to Dust Suppression Improvement Plans to meet the objectives and targets. This section details the Dust Management Strategy, and describes how the planning, checking, implementation, and consultation processes interact (graphically depicted in Figure 1).

¹ See Sections 5.2 and 7.1.4 for further information on the Dust and Water Management Team

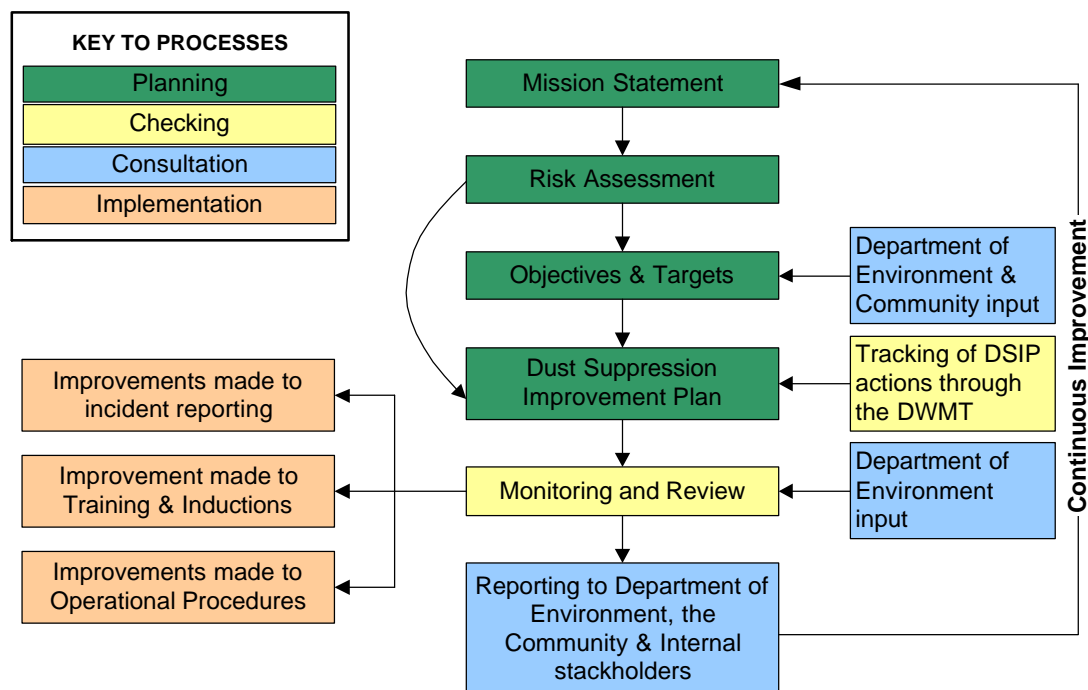


Figure 1. Dust Management Strategy Process Diagram

4.1 DUST RISK ASSESSMENT

4.1.1 Conducting the Dust Risk Assessment

On an annual basis, the Port Operations Manager coordinates a workshop with the Dust and Water Management Team to review the dust risk register, which outlines Hamersley Iron sources and activities which may contribute dust to the Dampier township.

During the review, significant risks with an existing Dust Suppression Improvement Plan action are not reviewed, as the actions are still planned for completion. Significant risks with a completed Dust Suppression Improvement Plan (DSIP) from the previous year are reassessed to check the effectiveness of the DSIP in reducing the residual risk. The DWMT considers the following when reviewing the risk register:

- Changes or additions to site activities and processes;
- Performance against previous years DSIP actions;
- New or changed legislation;
- Community feedback;
- Monitoring results;
- Internal and external audit findings;
- Existing operational controls.

4.1.2 2005 Dust Risk Register

The completed risk register appears in Appendix 1. Table 3 outlines the significant risks selected by the Dust and Water Management Team to be actioned over the 2005/2006 reporting period.

Table 3. Significant Risks to be addressed during 2005/2006.

DSIP Ref #	Dust Source	Potential Impact Areas	Residual Risk Rating
1.1	East Intercourse Island live stockpiles and roads - wind	1. Community – Dampier 2. Private – Dampier Salt	1.3
1.5	5E conveyer and road vehicles	1. Community - Dampier 2. Private - Dampier Salt	1.5
1.6	East Intercourse Island operational vehicles	1. Community - Dampier 2. Private - Dampier Salt	1.5
1.7	Parker Point operational vehicles	1. Community - Dampier 2. Private – King Bay	1.5

4.2 OBJECTIVES AND TARGETS

4.2.1 Setting Objectives and Targets

The Dust and Water Management Team set and approve objectives and targets that the Team plans to meet over the reporting period during the annual risk register review workshop.

In setting objectives and targets, the Team considers the following:

- Environmental risks identified in the dust risk register;
- Legal non-compliance issues;
- Audit findings and corrective actions;
- Stakeholder complaints and views;
- Technological options;
- Financial, operational, and business requirements.

4.2.2 2005 Objectives and Targets

Table 4 outlines the objectives and targets for the reporting period, as approved by the Port Operations Manager.

Table 4. 2005/2006 Objectives and Targets

DMP Objective #	Objective	Targets
1	Achieve a reduction in dust from Hamersley Iron's Dampier Port Operations.	1.1 Zero PM ₁₀ exceedances of 50 µg/m ³ over a 24 hour period as measured at the Dampier Primary School monitoring station, where there is a significant contribution by Hamersley Iron's operations ^(a) . 1.2 Zero TSP exceedances of 90 µg/m ³ over a 24 hour period as measured at the Dampier Primary School monitoring station, where there is a significant contribution by Hamersley Iron's operations ^(a) .
2	Ensure dust management practices meet legal requirements and stakeholder expectations.	2.1 Meet all ministerial conditions relating to dust management over the reporting period. 2.2 Comply with all Department of Environment licence requirements. 2.3 Implement all actions that are agreed to in community meetings, Coastal Community Environmental Forum meetings, and discussions between the Port Operations Manager and community members.
3	Ensure communication channels between stakeholders and Hamersley Iron are maintained	3.1 Respond to all external dust complaints 3.2 Hold a minimum of two CCEF meetings during the reporting period 3.3 Advertise the availability of the Pilbara Iron 1800 number through local print media on a regular basis.
4	Improve dust monitoring network to more thoroughly monitor dust generated from Hamersley Iron's Operations.	4.1 Reassess the continued monitoring of PM _{2.5} beyond the 12 months specified in Condition 7.1 of Ministerial Statement 638 by July 2006.

^(a) See Appendix 2 for methodology for calculating Hamersley Iron's contribution to dust levels in Dampier.

4.3 DUST SUPPRESSION IMPROVEMENT PLAN

4.3.1 Developing the Dust Suppression Improvement Plan (DSIP)

Once objectives and targets have been defined, the DWMT holds an annual DSIP development meeting.

The Dust Suppression Improvement Plan outlines actions to describe how Dampier Port Operations will meet the endorsed objectives and targets, and address high risk areas identified in the dust risk register.

Progress on the DSIP is tracked at monthly DWMT meetings. Additional actions that are undertaken during the reporting year are tracked in the same forum. The DSIP is aligned with the operations budgeting cycle to ensure adequate financial and human resources are allocated.

DSIP actions that are not complete by the end of the year will have existing resources assigned to completing them carried over into the following year. Planned DSIP items for the following year may need to be delayed to cater for this carry-over.

4.3.2 2005 Dust Suppression Improvement Plan

The 2005 Dust Suppression Improvement Plan was approved by the Port Operations Manager, and is included in Appendix 3. The status of existing DSIP actions for 2004/2005 are included Appendix 4.

5 MONITORING

The broad aim of the monitoring programme is to provide a quantitative measurement of how the Hamersley Iron Dampier Port Operations are performing against the Objectives and Targets. Secondary aims of the dust monitoring network are to:

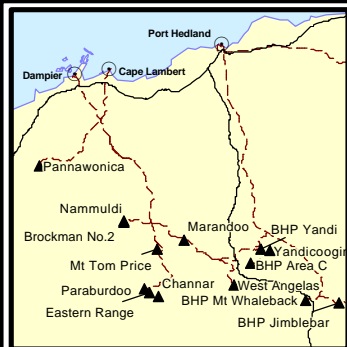
- Determine long-term trends in ambient dust levels.
- Determine Total Suspended Particulates (TSP), PM_{10} , and more recently, $PM_{2.5}$ concentrations, at representative locations within Dampier for comparison to criteria levels.
- Determine PM_{10} concentrations at a worst case location within King Bay for comparison to criteria levels.
- Determine PM_{10} and $PM_{2.5}$ concentrations at a nearby town (Karratha) that will have negligible impacts from the Dampier Port Operations, and therefore be representative of a typical Pilbara town.
- Provide scientific data to the community.

Hamersley Iron has monitored dust in the Dampier township since 1993. The Dampier Dust Monitoring network includes several different methods of dust monitoring aimed at targeting different undesirable effects of dust. Locations and details of the Dust Monitoring Network are outlined in Appendix 5 and graphically illustrated on Separate pdf Docs # 112892 or refer to pdf version of DMP in Docs

Figure 2. These methods include TSP, PM_{10} , dust deposition gauge, glossmeter monitoring, and more recently, $PM_{2.5}$. These monitoring methods are described in the following sections.

5.1 TOTAL SUSPENDED PARTICULATES (TSP)

Total suspended particulates are monitored at the Dampier Primary School using a real time sampler (Tapered Element Oscillating Microbalance, or TEOM). The measurement of TSP is directed towards defining nuisance dust impacts that enter the Dampier township as a result of the Dampier Port Operations. When elevated readings occur, measured levels are compared against the target level of $90\mu\text{g}/\text{m}^3$ 24 hour average (Target 1.2).



NB: Karratha Station Glossmeter location is not shown on map to preserve scale.

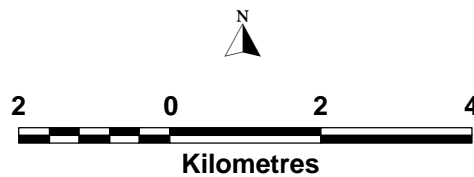


Figure 2 Dampier Port Operations Dust Monitoring Network

Author: R Archer & C Roe	Date: 16 August 2005
Drawn By: R Archer	Revised: NA
Plan No.: RA_2005_003	Report No.: DMP 2005/2006
Projection: MGA94, Zone 50	Scale: 1:100,000

5.2 PARTICULATE MATTER LESS THAN 10 MICRONS (PM₁₀)

PM₁₀ is a measure of particulate matter with an equivalent aerodynamic diameter 10 micrometres or less, and is monitored at the Dampier Primary School using a TEOM. A TEOM was also used to monitor PM₁₀ in Karratha until the 27 June 2005, when it was modified to monitor PM_{2.5} (see section 5.3 for further details). A real-time sampler to replace the PM₁₀ TEOM will be installed at Karratha by the end of October 2005, to allow comparison with the Dampier Primary School measurements.

The monitoring of PM₁₀ is directed towards defining the potential for health impacts, and for comparison against the target level of 50µg/m³ 24 hour average (Target 1.1).

5.3 PARTICULATE MATTER LESS THAN 2.5 MICRONS (PM_{2.5})

PM_{2.5} is a measure of particulate matter with an equivalent aerodynamic diameter 2.5 micrometres or less. An additional TEOM was installed at the Dampier Primary School to monitor PM_{2.5} in late June 2005, and the existing Karratha PM₁₀ TEOM was modified to monitor PM_{2.5}.

The monitoring of PM_{2.5} was initiated in response to conditions set by the Department of Environment (DoE) in Ministerial Statement 638, Condition 7.1. The continued monitoring of PM_{2.5} beyond the 12 months specified in Condition 7.1 will be reassessed at the end of the 12 month period (July 2006).

The 24 hour average PM_{2.5} concentrations recorded at the Dampier Primary School will be compared against the National Environmental Protection (Ambient Air Quality) Measure Advisory Reporting Standard of 25µg/m³ (24 hour average) as outlined in Table 2, Page 1.

5.4 GLOSSMETERS

A glossmeter monitoring trial was conducted in 2003 as an action in the Dust Suppression Improvement Plan. Based on the success of the program, the glossmeters now form a permanent part of the Dampier Dust Monitoring network. The trial was developed in response to community expectations for a measure of nuisance dust that can be observed visually, and carried out on community member properties if required.

The glossmeter is a portable unit with its own calibration slide (Figure 3). Readings take a few seconds to complete, and measurements are based on the amount of light reflected from the surface of the glass slide. The larger the amount of depositional dust on the slide, the lower the reflectance will be. Figure 4 shows the gloss meter slide arrangement.



Figure 3. Glossmeter monitoring equipment

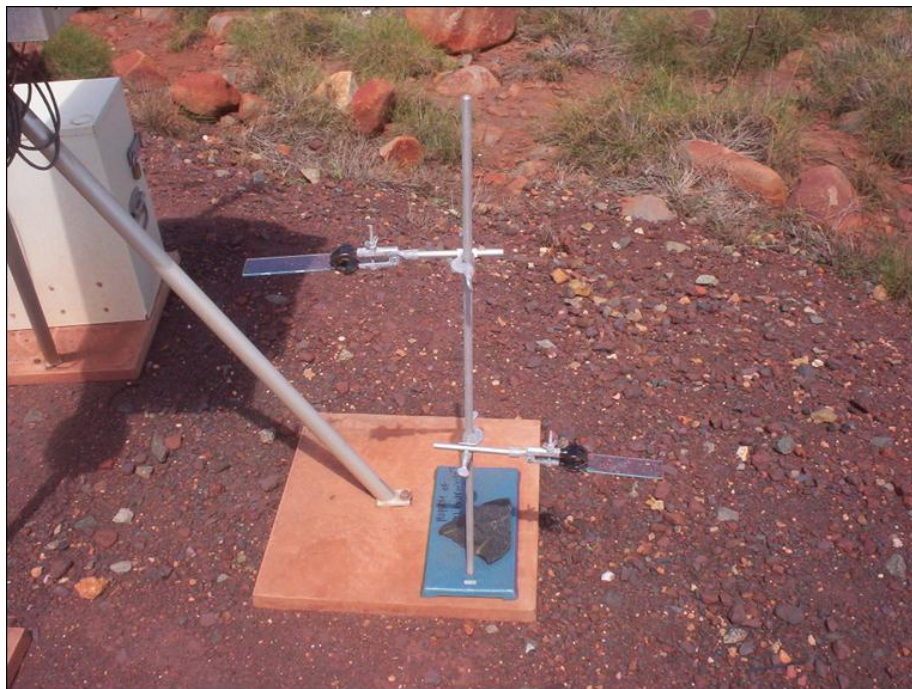


Figure 4. Glossmeter slide arrangement

6 RESPONSIBILITIES

All Hamersley Iron employees and contractors have responsibilities in relation to dust management. The main areas of responsibility at each level of the organisation are summarised in this section.

General Manager Ports and Infrastructure

- Ensure the site operates in accordance with Department of Environment licences.
- Ensure personnel are aware of their obligations under the Department of Environment licence.
- Approve and implement the Dust Management Plan.
- Ensure appropriate resources are available to meet the commitments made in the Dust Management Plan.

Manager Port Operations

- Provide resources to ensure employees are trained in the correct use of dust control equipment.
- Coordinate development of the Dust Management Plan.
- Communicate the Dust Management Plan to Port Operations personnel.
- Coordinate and chair the Dust and Water Management Team meetings.
- Provide resources to participate in dust control trials.

Manager Port Maintenance

- Provide resources to ensure dust control equipment is well maintained and operational.
- Provide resources to participate in dust control trials.
- Support the Manager – Port Operations in the implementation of the Dust Management Plan where required.

Manager Environment

- Maintain the dust monitoring network and associated quality assurance programme.
- Produce relevant internal and external dust reports.
- Chair the Coastal Communities Environmental Forum (CCEF).

- Develop and implement community consultation programmes.
- Establish and maintain greening areas at the Dampier Port Operations.

Superintendent Port Operations

- Ensure team members and contractors comply with relevant environmental licence conditions.
- Communicate dust performance to team members.

Superintendent Logistics

- Undertake road management, including spillage clean-up, road watering, and operation of the road sweeper.

Other Port Superintendents

- Ensure team members and contractors comply with relevant environmental licence conditions.
- Communicate dust performance to team members.

All Employees

- Report dusty conditions and/or faulty equipment that may result in dusty conditions.
- Adhere to standard operating procedures.
- Suggest dust control improvements.

Dust and Water Management Team

- Drive improvement in dust performance in all parts of the iron ore handling process at East Intercourse Island and Parker Point from inloading to outloading.
- Profile dust sources and controls.
- Facilitate the flow of ideas and information to and from the operations crews to maintain and improve their ability to manage dust in all aspects of the operations.
- Recommend improvements or alternatives to existing dust controls as appropriate.
- Conduct or facilitate trials of new controls as appropriate.
- Facilitate appropriate change management practices for dust improvement projects.
- Track all dust improvement plans being performed at the Port Operations, and provide this information to interested parties in an appropriate format as required.
- Consolidate and report on performance against dust measures.

7 COMMUNICATION

7.1 INTERNAL

There is a wide range of communication channels through which Hamersley Iron staff are informed of dust management issues and practices occurring at the Dampier Port Operations. Many of these channels are two-way and provide staff with a means to raise issues associated with dust management at the site.

7.1.1 Inductions and Training

All personnel who work autonomously are required to undertake site induction training. Topics covered in the induction include the significance of dust management at the site and its potential impact on the Dampier community, and the responsibilities of all personnel on site to minimise the amount of fugitive dust generated by the operations. Individuals must prove competent at the induction by undertaking an assessment.

Additional training is provided in the form of “Environmental Awareness Modules”, with one module specifically focussed on dust management at the Dampier Port Operations. These modules are presented on an as-needed basis by the Environment Department.

7.1.2 Incident Reports

All internal dust related observations are recorded as incident reports. These reports are entered into a Hamersley Iron database for tracking and management, and are reviewed on a monthly basis by the Senior Management at the monthly Health, Safety and Environment meeting, and by the Dust and Water Management Team.

7.1.3 Health, Safety and Environment Meeting (Site Level)

Monthly Health, Safety and Environment meetings are held for the site. All significant dust management issues are communicated in this forum, including both internal and external reports.

7.1.4 Dust and Water Management Team Meeting

A monthly meeting is held to review dust performance and fresh water usage, discuss internal and external dust issues, review the previous months dust and water monitoring, discuss new ideas, and document the status of Dust Suppression Improvement Plan actions and other dust initiatives being implemented.

The DWMT comprises the Port Operations Manager, Port Operations Superintendent, Site Environmental Advisor, Superintendent Environment, Superintendent Process Improvement, Staff Operators, and Staff Maintainers.

All information generated from the DWMT meeting, including the meeting minutes, presentations, and the monthly dust monitoring review, is uploaded to the Hamersley Iron Dampier Ports Operations intranet site, which is accessible to all Hamersley Iron employees.

7.1.5 Port Operations Scoreboard Meeting

The Superintendent Port Operations holds monthly scoreboard meetings in which dust levels are compared with internal incidents reports to encourage increased internal dust incident reporting.

7.1.6 Hamersley Iron Board Reports

Six monthly reports to the Hamersley Iron board and Rio Tinto contain information about significant dust management issues that may have arisen during the reporting period.

7.1.7 Exceedance Analysis

On a daily basis, the Site Environmental Advisor checks the previous 24-hour monitoring results from the Dampier Primary School TEOMs. If an exceedance of either the TSP or PM₁₀ target levels or NEPM PM_{2.5} advisory standard, is recorded, the Site Environmental Advisor provides an exceedance analysis to the Port Operations Manager and Port Operations Superintendent.

7.2 EXTERNAL

There are several forums through which communication is facilitated between the Hamersley Iron Dampier Port Operations and members of the community and government. Due to the proximity of the Dampier township to the Hamersley Iron port operations, the community forms a key part of the operations dust management strategy.

7.2.1 Annual Environmental Report

The Annual Environmental Report includes a review of dust monitoring results, comparison against performance targets, a summary of dust management initiatives from the reporting period, and proposed initiatives for the next reporting period. The Annual Environmental Report is submitted to the Office of Major Projects, which then distributes copies of the report to several government agencies. The Report can be viewed by members of the public upon request.

7.2.2 Coastal Community Environmental Forum

The principal forum for liaison with the local community is the Coastal Community Environmental Forum (CCEF). This Forum was initially established in December 2000 as the Dampier Samson Dust Working Group, and has representatives from the community (2), Roebourne Shire (3), Department of Environment (1), Dampier Port Authority (1), Water Corporation (1), Robe (1) and Hamersley Iron (2). The CCEF can meet as required, with a minimum of two meetings per year. Progress on key elements of the Dust Management Plan are reported to and discussed with CCEF members.

The Coastal Community Environmental Forum provides the following:

1. A formal mechanism for community representatives to communicate their views on any environmental issues of relevance to present and potential future operations of Rio Tinto operated iron ore companies located on the Pilbara coast.
2. An avenue for the companies to provide information to the community on environmental aspects of the operations activities, monitoring, and future plans, with allowance for community comments and feedback on these.
3. An avenue for community requests for information on environmental aspects of the operations activities, monitoring, and future plans.
4. Consultation on the type of information required by the community, and the content of company information being distributed on environmental issues.

7.2.3 Complaints

Pilbara Iron have an established dust complaint telephone number managed by Link Telecommunications (1800 455 465). The availability of this number is regularly communicated in local print media. The line is operated 24 hours per day and allows callers to identify themselves or remain anonymous. Complaints are recorded, disseminated, and responded to as per the Complaint Evaluation and Response Flowchart (Figure 5). All received complaints are collated, analysed, and reported on by the Hamersley Iron Environment Department as part of dust performance reporting.

The Department of Environment provide Hamersley Iron with details of any complaints received on a monthly basis. Hamersley Iron investigates these complaints and includes the findings as part of the reporting process outlined in Figure 5.

Both the Hamersley Iron and Pilbara Iron internet sites (www.hamersleyiron.com; www.pilbarairon.com) contain links to an email address (environmentteam@riotinto.com) where any queries or complaints on environmental performance can be sent.

7.2.4 Exceedance Analysis

Any PM₁₀ or TSP exceedance recorded in Dampier where the Hamersley Iron calculated contribution is greater than 50% is reported to the Department of Environment North-West Regional Office and the Air Quality Management Branch.

The report will include the meteorological, TSP and PM₁₀ data from the Dampier Primary School monitoring equipment.

7.2.5 Internet

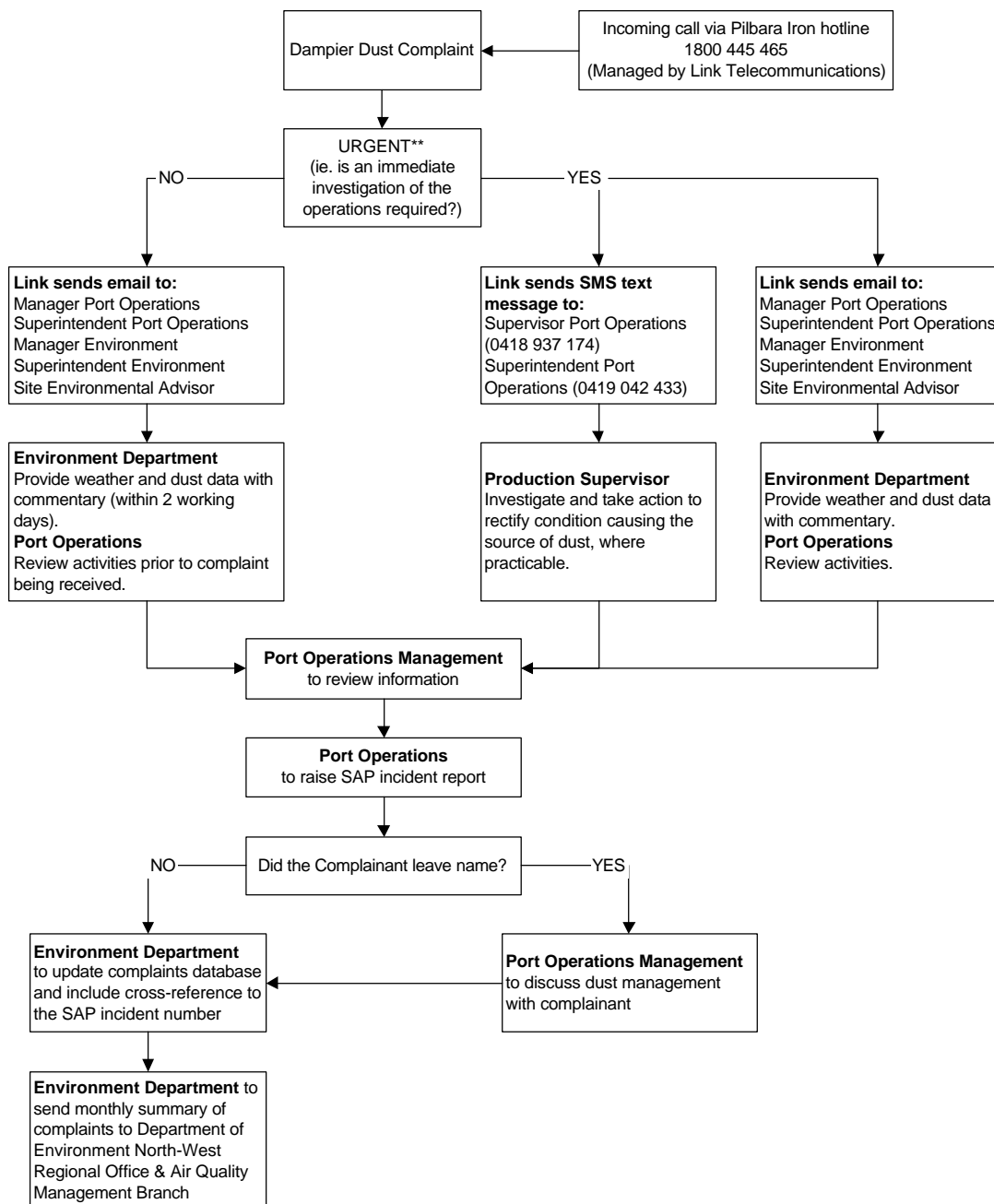
On the Hamersley Iron internet site (www.hamersleyiron.com/previous7.asp), the following data from the Dampier Primary School PM₁₀ TEOM is updated on a 12-hourly basis:

- A seven day plot of 12-hour average PM₁₀ dust concentrations, wind speeds and wind directions;
- A wind rose showing wind speed and directions for the previous 12 hours;

- A dust scatter plot showing 10-minute average PM₁₀ concentrations for the previous 12 hours.

7.2.6 Hamersley Iron Social and Environment Reports

The annual Social and Environment Report includes a summary of the main dust management initiatives from the previous year, and the initiatives planned for the following year. The Report is publicly available via the Hamersley Iron internet site.



** URGENT = dust event is occurring when complaint is being lodged. Immediate investigation required.
NOT URGENT = dust has passed when complaint is being lodged. Timely response required.

Figure 5. Complaint Evaluation and Response Flowchart

7.2.7 Community Newsletters

The Coastal Times (previously the Archipelago Times) is a Pilbara Iron community newsletter for the towns of Dampier, Karratha, Roebourne, Wickham, and Point Samson which is delivered to post boxes and households in these towns. The newsletter aims to keep community members informed of the activities at Pilbara Iron's coastal and rail operations, and to report on events in these communities.

Articles on environmental management at the Dampier Port Operations are regularly included in the newsletter, including details on recent dust management initiatives and outcomes.

7.2.8 Dampier Port Operations Site Environmental Advisor

The Dampier Port Operations Site Environmental Advisor is available to respond to and provide information on any internal or external dust inquiries.

8 SYSTEM AND PERFORMANCE REVIEW

8.1 SYSTEM REVIEW

The suitability, adequacy and effectiveness of the Dust Management Plan is reviewed annually at the DWMT meeting. The review considers the following:

- Suitability of the Mission Statement;
- The extent to which objectives and targets have been met;
- Dust concerns or complaints from external stakeholders;
- General dust performance based on monitoring results;
- Periodic audit findings from the Department of Environment;
- Periodic internal audit findings of dust management practices;
- Periodic internal technical reviews of dust control trials and investigations;
- Changing circumstances, including developments in legal and other requirements; and
- Annual external review of dust management practices and dust monitoring results.

Any changes or recommendations for improvement identified in this meeting are incorporated into the annual review of the Dust Management Plan.

8.2 PERFORMANCE REVIEW

Each year, a documented review of performance against the previous year's Dust Management Plan and associated Dust Suppression Improvement Plan is undertaken. The Performance Review is intended to:

- Report on Hamersley Iron's performance against objectives and targets, and the Dust Suppression Improvement Plan;
- Provide a review and analysis of dust monitoring results for the reporting year;
- Analyse trends in monitoring data, evaluate the effectiveness of completed improvement plans, and compare data to standards and guidelines where relevant;
- Summarise complaints relating to dust received from the community; and
- Provide analyses of exceedances recorded at the Dampier Primary School against the agreed standards for PM₁₀ and TSP.

The Performance Review also captures the outcomes of the annual DWMT review meeting. The Performance Review is prepared by the Superintendent Environment – Coastal Operations and is submitted to the Department of Environment on an annual basis. Where applicable, results from this Review will be incorporated into the implementation elements outlined in Figure 1, which include incident reporting, operational procedures, and training and awareness.

The 2004 Performance Review of the 2003/2004 Dust Management Plan was submitted to the Department of Environment on the 7 July 2004. To bring the review and submission process in line with the Hamersley Iron and Robe River Iron Associates Annual Environmental Report (AER), the next review will be submitted as part of the AER, due on the 31 March 2006, and as per conditions set out in DoE licence numbers 4542/9 and 6951/10.

Appendix 1. 2005 Dust Risk Register

Dust Management Plan Risk Register

Document Number:	
Version Date:	
Version:	
Approved By:	
ISO14001 Ref:	4.3.1

SITE: Dampier

Inherent Probability

Inherent risk gives you an indication of the "true" risk of the impact occurring when there are no controls in place to mitigate the risk. To score inherent risk we assume that the impact will occur - therefore we can only use probability descriptors **Frequent**, **Probable** or **Occasional**. Do not use **Remote** or **Improbable**. After we consider existing controls (physical, procedural, behavioural), the risk is rescored to determine the effectiveness of the controls in lowering the inherent risk.

Existing Control Examples

Physical: water sprays, use of water trucks, speed limits, conveyor cleaners.
Procedural: CBP with environmental content, management plans, inspection checklists, training
Behavioural: competency assessments, performance management system requirements, cultural

Reference #	Dust Source	Environmental Issue	Potential Impact Area	Inherent Risk			Existing Controls	Residual Risk		
				Probability	Consequence	Risk Rating		Probability	Consequence	Risk Rating
1.1	EII live stockpiles and roads - wind	Dust generation	Community - Dampier Private - Dampier Salt	Frequent	Critical	1.3	Physical: Use of water truck, Speed limit of 25 km/hr on unsealed roads, water application through stackers Behavioural: Employees call Port Operations Supervisor and report high dust levels. Supervisor takes corrective actions including but not limited to: reschedule water truck movements, operation of additional sprays not already in sue, additional road sweeping.	Frequent	Critical	1.3
1.2	PP live stockpiles and roads - wind	Dust generation	Community - Dampier Private - King Bay	Frequent	Critical	1.3	Physical: Use of water truck, Speed limit of 25 km/hr on unsealed roads, water application through stackers Behavioural: Employees call Port Operations Supervisor and report high dust levels. Supervisor takes corrective actions including but not limited to: reschedule water truck movements, operation of additional sprays not already in sue, additional road sweeping.	Frequent	Critical	1.3
1.3	EII bulking operations	Dust generation	Community - Dampier Private - Dampier Salt	Probable	Critical	1.5	Physical: Use of water trucks, Speed limit of 25 km/hr on unsealed roads, water sprays on bulk conveyor, water sprays in bulking hopper. Procedural: Bulking Procedure	Probable	Critical	1.5
1.4	PP bulking operations	Dust generation	Community - Dampier Private - King Bay	Probable	Critical	1.5	Physical: Use of water trucks, Speed limit of 25 km/hr on unsealed roads, water sprays on bulk conveyor and on hopper Procedural: Bulking Procedure	Probable	Critical	1.5
1.5	5E conveyer and road vehicles	Dust generation	Community - Dampier Private - Dampier Salt	Probable	Critical	1.5	Physical: spillage cleanup, speed limits around building,, Belle Banne scrapers on heads of all conveyors, Wind deflectors on all conveyors, HPLV spray on return strand of 5E, dust hoods along 5E, road-sweeper. Behavioural: Employees call Port Operations Supervisor and report high dust levels. Supervisor takes corrective actions including but not limited to: reschedule water truck movements, operation of additional sprays not already in sue, additional road sweeping.	Probable	Critical	1.5
1.6	EII operational vehicles	Dust generation	Community - Dampier Private - Dampier Salt	Frequent	Marginal	1.6	Physical: Use of water trucks/application of bitterns on roads, Speed limit of 25 km/hr on unsealed roads, use of road-sweeper to remove excess dust from sealed roads. Behavioural: Employees call Port Operations Supervisor and report high dust levels. Supervisor takes corrective actions including but not limited to: reschedule water truck movements, operation of additional sprays not already in sue, additional road sweeping.	Frequent	Marginal	1.6
1.7	PP operational vehicles	Dust generation	Community - Dampier Private - King Bay	Frequent	Marginal	1.6	Physical: Use of water trucks/application of bitterns on roads, Speed limit of 25 km/hr on unsealed roads, use of road-sweeper to remove excess dust from sealed roads. Behavioural: Employees call Port Operations Supervisor and report high dust levels. Supervisor takes corrective actions including but not limited to: reschedule water truck movements, operation of additional sprays not already in sue, additional road sweeping.	Frequent	Marginal	1.6

Reference #	Dust Source	Environmental Issue	Potential Impact Area	Inherent Risk			Existing Controls	Residual Risk		
				Probability	Consequence	Risk Rating		Probability	Consequence	Risk Rating
1.8	EII bulk stockpiles north - wind	Dust generation	Community - Dampier Private - Dampier Salt	Frequent	Marginal	1.6	Procedural: Bulking procedure for Dust Management. Physical: Use of water trucks.	Frequent	Marginal	1.6
1.9	EII screening building	Dust generation	Community - Dampier Private - Dampier Salt	Probable	Critical	1.5	Physical: Screenhouse building enclosed, spillage cleanup, speed limits around building, Belle Banne scrapers on heads of all conveyors, shaker type fabric filter dust collector- Fuller-Dracco Mark II Shaker- 8 compartments- cloth area 5638 m2 total- Design pressure drop 25 to 80 mm Wg- 1 Richardson 1320 CY fan, Ducted capture hood system Procedural: Regular maintenance checks by Clydes	Probable	Marginal	2.3
1.10	Parker Point screening building including wind	Dust generation	Community - Dampier Private - King Bay	Probable	Critical	1.5	Physical: Screening building enclosed, spillage cleanup, speed limits around building,, - Wet scrubber system- Clyde Aeromix 717 type wet scrubbers- 2 pairs of twin scrubbers- Design pressure drop 120 to 200 mmWg- 2 Powermax 60 RT 160 fans Procedural: Regular maintenance checks by Clydes	Probable	Marginal	2.3
1.11	EII ship loader	Dust generation	Community - Dampier Private - Dampier Salt	Probable	Marginal	2.3	-	Probable	Marginal	2.3
1.12	PPT ship loader	Dust generation	Community - Dampier Private - King Bay	Probable	Marginal	2.3	-	Probable	Marginal	2.3
1.13	EII transfers - outgoing	Dust generation	Community - Dampier Private - Dampier Salt	Probable	Critical	1.5	Physical: 5E/6E transfer: Pulse type fabric filter dust collector- Fuller-Dracco Plenum Pulse- 3 compartments- cloth area 139 m2 total- Design pressure drop 50 to 150 mm Wg, 1 Richardson 445CY fan, Ducted capture through 2 pick-up points. 14E/17E/18E transfer: Shaker type fabric filter dust collector- Fuller-Draco Mark II Shaker- 3 compartments- cloth area 511 m2 in total- design pressure drop 25 to 80 mm Wg, 1 Richardson 540 CY fan- Ducted capture system with 3 operational modes 18E/20E transfer: Pulse type fabric filter dust collector- Fuller-Draco Plenum Pulse- 5 compartments- cloth area 241 m2 total- design pressure drop 50 to 150 mm Wg- 1 Richardson 540 CY fan	Probable	Marginal	2.3
1.14	EII bulk stockpiles - wind	Dust generation	Community - Dampier Private - Dampier Salt	Frequent	Negligible	3.5	Procedural: Bulking procedure for Dust Management. Physical: Use of water trucks.	Frequent	Negligible	3.5
1.15	PP bulk stockpile wind	Dust generation	Community - Dampier Private - King Bay	Frequent	Negligible	3.5	Procedural: Bulking procedure for Dust Management. Physical: Use of water trucks.	Frequent	Negligible	3.5
1.16	EII screening building area -	Dust generation	Community - Dampier	Probable	Negligible	3.6	Physical: spillage cleanup, speed limits around	Probable	Negligible	3.6
1.17	PP transfers outgoing	Dust generation	Community - Dampier Private - King Bay	Probable	Marginal	2.3	Physical: Water sprays	Probable	Negligible	3.6
1.18	EII reclaiming	Dust generation	Community - Dampier Private - Dampier Salt	Probable	Marginal	2.3	Procedural: Procedure for operating reclaimer. Physical: Water sprays on Reclaimer.	Probable	Negligible	3.6
1.19	PP reclaiming	Dust generation	Community - Dampier Private - King Bay	Probable	Marginal	2.3	Physical: Water sprays located at:- bucketwheel- bucketwheel transfer- conveyor load chute- loading boot- Closed circuit TV cameras for monitoring visible dust levels	Probable	Negligible	3.6
1.20	1-4E to 5EX over	Dust generation	Community - Dampier Private - Dampier Salt	Probable	Marginal	2.3	Physical: Pulse type fabric filter dust collector- Fuller-Dracco Plenum Pulse- 3 compartments- cloth area 139 m2 total- Design pressure drop 50 to 150 mm Wg- 1 Richardson 445CY fan, Ducted capture through 2 pick-up points, Water sprays- 5E tail, causeway and head sprays- 5E return sprays	Probable	Negligible	3.6
1.21	EII stacking	Dust generation	Community - Dampier Private - Dampier Salt	Probable	Marginal	2.3	Physical: Automatic control system interlock to ensure stacker boom lowered from maximum height prior to commencing stacking, 3 sets of water sprays, system allows dummy programme to be used to water stockpiles	Probable	Negligible	3.6
1.22	PP stacking	Dust generation	Community - Dampier Private - King Bay	Probable	Marginal	2.3	Physical: Automatic control system interlock to ensure boom height between given limits prior to commencing stacking, water sprays which can be operated in either automatic or manual mode, dust suppression mode available to water stockpiles	Probable	Negligible	3.6
1.23	PP ship loader 2	Dust generation	Community - Dampier Private - King Bay	Probable	Negligible	3.6	-	Probable	Negligible	3.6

Appendix 2. Methodology for determining Hamersley Iron's contribution to PM₁₀ and TSP at Dampier

Summary

For evaluating compliance with performance targets at the Dampier Primary School site, Hamersley Iron's contribution to the PM₁₀ and TSP target levels are estimated by calculating the percentage dust load for the relevant 24-hour period from within the Hamersley Iron operations arcs given in Table A2.1 plus 25° to allow for plume spread. A background concentration of 11 µg/m³ is also assumed. If the percentage dust load from the Hamersley Iron operations arcs exceeds 50% and other sources such as wildfire smoke have been discounted, Hamersley Iron records that its operations significantly contributed to that exceedance.

Table A2.1. Bearings of Hamersley Iron operations to particle monitors at Dampier

Source	Bearing (from) (°)		
	Dampier Primary School TEOMs	East Intercourse Island EBAM	Parker Point EBAM
Ocean	305 - 28	338-30	275-329
Parker Point operational area	28 - 59	30 - 57	329 - 59
Land	59 - 201	57-152	59-223
East Intercourse Island operational area including 5E Conveyor and Road	201 - 305	152 - 338	223 - 275

Explanation

The wind direction arcs from the monitor to the Hamersley Iron operational areas shown in Table A2.1 have been expanded by 25° either side to allow for wind direction changes over distance and the dispersion of emitted dust.

The reason for using loads (ie. the summed product of dust concentration and time for each 10-minute sampling period within the respective source direction arcs), rather than the average dust concentrations from each direction, is to ensure that the duration of the dust concentration impacting from each source is taken into account. For example, if the frequency of wind directions over a 24-hour period were 90% from Hamersley Iron sources but concentrations were identical for all wind directions, Hamersley Iron would be deemed to have contributed 90% of the load comprising the 24-hour average concentration, rather than the 50% if calculated on a simple concentration basis.

This method will over-estimate Hamersley Iron's contributions if "dust" concentrations upwind of the Hamersley Iron operational areas are not excluded.

The "polar plot" in Figure A2.1 illustrates that "dust" is measured when winds are from Hamersley Iron operational areas as well as when winds are from the ocean and elsewhere from the land. For example, the average PM₁₀ concentration when winds are from the ocean is about 20 µg/m³.

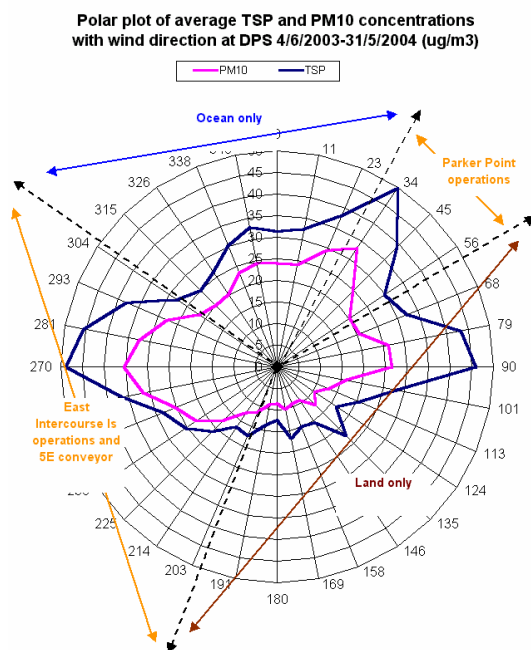


Figure A2.1. Polar plot of average TSP and PM₁₀ concentrations with wind direction at Dampier Primary School

Since the ocean lies upwind of the trajectories from both East Intercourse Island and Parker Point to the Dampier township, even without Hamersley Iron's operations, a PM₁₀ concentration of about 20 µg/m³ would be measured during winds from these directions.

It is arguable that this average measured concentration from the ocean should be subtracted from the measured concentrations when winds are from the Hamersley Iron operational areas in order to estimate Hamersley Iron's dust contribution in isolation. Given, however, that there are inherent uncertainties in this type of analysis, it is responsible to try and avoid any significant underestimations of Hamersley Iron's contributions.

It has therefore been assumed for studies of Hamersley Iron's dust impacts that the background "dust" contribution from the ocean is 11 µg/m³. This choice is a matter of judgement based on an analysis of the shore-line PM₁₀ measurements when winds are from the ocean only. The analysis showed that for 75% of the time, concentrations are actually more than 11 µg/m³.

In summary, the estimates of Hamersley Iron contributions to Dampier for studies of Hamersley Iron's dust impacts are therefore the measured concentrations when winds are from the arc to the Hamersley Iron sources plus 25°, less 11 µg/m³ to account for some contribution to the measured data from the ocean.

Appendix 3. 2005/2006 Dust Suppression Improvement Plan



Dust Suppression Improvement Plan

Site: Dampier Port Operations

Year: 2005-2006

Dust Suppression Improvement Plan Endorsement

This DSIP and its associated actions, accountabilities and timeframes for completion were authorised and endorsed by the Port Operations Manager.

DSIP #	Origin of DSIP Action (Objective and Target #)	Description of DSIP Action	Accountability	Timeframe for Completion	Status In progress Complete On hold No progress
2005.01	DMPO 04	Replace the PM10 dust monitoring equipment at Karratha which was recently modified to monitor PM2.5	Environment	Sep-05	
2005.02	DMPO 02	Undertake a more detailed study on the potential effectiveness of a top strand cover on 5E conveyor.	Port Operations	Dec-05	
2005.03	DMPO 01	Implement selected options from external study on dust suppression options for 5E conveyor including improved return strand cleaning mechanism and widening of 5E causeway road.	Port Operations	Feb-06	
2005.04	DMPO 01	Trial crusting agents on stockpiles.	Port Operations	Apr-06	
2005.05	DMPO 01	Implement a process to use site-specific weather forecasts for proactive dust control strategies.	Port Operations	Apr-06	
2005.06	DMPO 01	Improve monitoring of dust suppression controls to ensure dust mitigation procedures and practices are followed.	Port Operations	May-06	
2005.07	DMPO 01	Investigate dust suppression options for 20E and 21E at East Intercourse Island.	Port Operations	May-06	
2005.08	DMPO 01	Purchase second road sweeper (to be dedicated to East Intercourse Island).	Port Operations	Jun-06	
2005.09	DMPO 01	Install additional kerbing on selected sealed roads at East Intercourse Island and Parker Point.	Port Operations	Aug-06	
2005.10	DMPO 02 DMPO 04	Undertake on-site dust sampling for PM10 and TSP to update the dust emissions inventory.	Environment	Aug-06	
2005.11	DMPO 02 DMPO 03	Regularly report on ambient dust levels in Dampier and Karratha to the community.	Environment	Aug-06	
2005.12	DMPO 02 DMPO 03	Regularly advertise the availability of the Pilbara Iron 1800 LINK number in local print media.	Environment	Aug-06	
2005.13	DMPO 01	Assess recommendations from external study on dust suppression options for the EII stockyards, and implement options where feasible.	Port Operations	Aug-06	

Appendix 4. Status of Actions in the 2004/2005 Dust Suppression Improvement Plan

Objective	DSIP #	DSIP	Performance Measure	Accountability	Planned Completion Date	Status	Comments
DMPO 04: Improve dust monitoring network to more thoroughly monitor dust generated from Hamersley Iron's operations.	2004.1	Commission additional dust monitoring equipment for King Bay to monitor PM ₁₀ .	Satisfactory performance of equipment in suitable location	Environment Department	July 2005	Complete	PM ₁₀ EBAM installed at Woodside Supply Base.
	2004.2	Commission additional dust monitoring equipment at Dampier Primary School and Karratha to monitor PM _{2.5}	Satisfactory performance of equipment.	Environment Department	July 2005	Complete	New PM _{2.5} TEOM installed at Dampier Primary School; PM ₁₀ TEOM at Karratha modified to monitor PM _{2.5}
	2004.3	Investigate using forecasted weather conditions to predict high dust levels in the Dampier township with an elevated Hamersley Iron contribution.	Achieve target by completion date	Environment Department	March 2005	Complete	Five day weather forecasts are being received from the Bureau of Meteorology for Dampier.
	2004.4	Use a road sealer to seal Dampier Primary School carpark to better monitor ambient dust levels in the Dampier township.	Achieve target by completion date	Environment Department	February 2005	Complete	The carpark has been sealed.
	2004.5	Refine glossmeter monitoring program in Dampier and expand to include Karratha Station.	Satisfactory performance of equipment.	Environment Department	October 2004	Complete	Additional glossmeters installed at Karratha Station and 69 Hardy Crescent.
DMPO 01: Achieve a reduction in dust from Hamersley Iron Port Operations and DMPO 02: Ensure dust management practices meet licence requirements, ministerial conditions, and stakeholder expectations.	2004.6	Assess recommendations from external study on dust suppression options for 5E conveyor. Implement options where feasible.	Achieve target by completion date	Port Operations	December 2006	Complete	Two options have been selected and will be implemented as part of the 2005/2006 DSIPs.
	2004.7	Commission an external consultant to investigate dust improvement opportunities for EII stockyard	Achieve target by completion date	Port Operations	June 2005	Complete	The investigation and report has been completed.
	2004.8	Install automated water sprays on EII conveyors 13E and 14E.	Reduction in visible dust levels.	Port Operations	April 2005	In progress	Will be completed by December 2005.
	2004.9	Investigate improving dust suppression on access road to EII stockyard.	Reduction in visible dust levels.	Port Operations	July 2005	Complete	Investigation completed – implementation included in 2005/2006 DSIPs.
	2004.10	Trial improved belt cleaning mechanism on at least one conveyor.	Reduction in visible dust levels.	Port Operations	May 2005	In progress	Will be completed by December 2005.

Appendix 5. Dampier Port Operations Dust Monitoring Network

Site name	Location (GDA94)		Parameter Measured	Monitor Type	Period of Monitoring	Comments
	Easting (m)	Northing (m)				
East Intercourse Island (EII)	468,139	7,713,808	PM ₁₀	EBAM	04.06.2003 – current	
			Nuisance Dust	Glossmeter	14.01.2004 – current	
EII Lookout	466,699	7,716,014	Nuisance Dust	Glossmeter	14.01.2004 – current	
EII Tugpen	467,170	7,715,110	Nuisance Dust	Glossmeter	30.05.2004 – current	
EII Tugpen (DP8)	467,170	7,715,110	Nuisance Dust	Deposition Gauge	22.05.2001 - current	
EII 5E	466,956	7,715,317	Nuisance Dust	Glossmeter	30.05.2004 – current	
EII 5E (DP10)	466,956	7,715,317	Nuisance Dust	Deposition Gauge	05.06.2001 - current	
Parker Point Gatehouse	471,403	7,716,177	PM ₁₀	EBAM	03.06.2003 – current	
			Nuisance Dust	Glossmeter	14.01.2004 – current	
Parker Point Screenhouse	471,383	7,717,427	Nuisance Dust	Glossmeter	12.08.2004 – current	
Dampier Primary School	469,348	7,715,001	PM ₁₀	TEOM	13.04.2000 – current	
			PM _{2.5}	TEOM	23.06.2005 – current	New instrument installed on 23.06.2005
			TSP	TEOM	23.02.2002 – current	
			PM ₁₀	EBAM	05.09.2002 – 13.06.2005	Removed to accommodate new PM _{2.5} TEOM
			Met data (10m)	Various	24.02.1998 – current	
			Nuisance Dust	Deposition Gauge	27.11.2002 - current	
			Nuisance Dust	Glossmeter	14.01.2004 – current	
Karratha (Water Corporation Pump Station)	485,417	7,708,000	PM ₁₀	TEOM	22.02.2002 – 28.06.2005	Modified to monitor PM _{2.5}
			PM _{2.5}	TEOM	28.06.2005 – current	
			Met data (5m)	Various	22.02.2002 – current	
			Nuisance Dust	Deposition Gauge	27.11.2002 - current	
			Nuisance Dust	Glossmeter	14.01.2004 – current	
69 Hardey Crescent Dampier	469,630	7,714,912	Nuisance Dust	Glossmeter	23.11.2004 – current	
Patterson Crescent Dampier	470,675	7,715,702	Nuisance Dust	Glossmeter	14.01.2004 – current	
Karratha Station			Nuisance Dust	Glossmeter	29.10.2004 – current	
King Bay	473,525	7,719,352	PM ₁₀	EBAM	26.08.2005 – current	EBAM originally located at Dampier Primary School