

**EXTERNAL AUDIT REPORT IN FULLFUMENT OF THE  
ENVIRONMENTAL AUTHORISATION FOR THE  
CONSTRUCTION AND OPERATION OF TWO ADDITIONAL KILNS  
#5 AND #6 FOR THE PRODUCTION OF DIRECT REDUCED IRON  
(DRI)  
AT  
ARCELORMITTAL SOUTH AFRICA  
VANDERBIJLPARK WORKS**



Report Nr: 962-ZANAMVD-2018

Audit date: 9 May 2018  
Report date: 12 July 2018

<b>GENERAL INFORMATION</b>	
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<b>Status</b>	Final
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## EXECUTIVE SUMMARY

Zantow Environmental Consulting Services CC was contracted by ArcelorMittal to conduct an independent compliance audit on the Record of Decision (RoD) for the construction and operation of two additional kilns (Kilns # 5 and #6) at the Vanderbijlpark Work's which was received from the Gauteng Department of Agriculture, Conservation and Environment (GDACE), now the Gauteng Department of Agriculture and Rural Development, ("GDARD") on the 22<sup>nd</sup> February 2007.

The methodology followed for conducting the compliance assessment audit was as follows;

- Compilation of audit checklist/questionnaire for site visit;
- Site Visit (Conducted on the 9th May 2018); and
- Document review (RoD) and its amendments (9th May 2018)
- Compilation of compliance audit report

Condition 3.4 (b) of the RoD issued to ArcelorMittal South Africa Vanderbijlpark Works, requires that an annual Environmental Performance Audit be undertaken by an independent external auditor and the audit report submitted to GDARD.

Table 1 set out the compliance with the authorisation conditions and where non-compliances were recorded the auditor ranked the specific non-compliances in terms of the following criteria:

- Historic Issues
- Minor Issues
- Moderate Issues
- Critical Issues

In general, ArcelorMittal is compliant with the authorisation conditions. The main concerns raised during the audit was the Sulphur Dioxide load recorded from the works. Condition 3.2.n required certain emission reductions to be achieved at certain stages. The requirements were met by ArcelorMittal. The data from the emissions inventory currently however shows that the SO<sub>2</sub> reduction is no longer achieved. According to ArcelorMittal it is partly due to the changes made how they calculate the SO<sub>2</sub> load. The calculations and inventory scope improved overtime and the recorded increase is therefore partly as a result of the way in which the figure is calculated. The emission reduction project specified in the Emission Reduction Strategy should be implemented as per the project plans.

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## 1. INTRODUCTION

Zantow Environmental Consulting Services CC was contracted by ArcelorMittal to conduct an independent compliance audit on the Record of Decision (RoD) for the construction and operation of two additional kilns (DR Kiln 5 & 6) at the Vanderbijlpark Work's which was received from the Gauteng Department of Agriculture, Conservation and Environment (GDACE) now the Gauteng Department of Agriculture and Rural Development, (GDARD).

The RoD received from ArcelorMittal for auditing is referenced as follows:

- Construction and operation of the DR Kiln 5 and 6 – GAUT 002/04-05/1781, dated 22<sup>nd</sup> February 2007

The methodology followed for conducting the compliance assessment audit can be described as

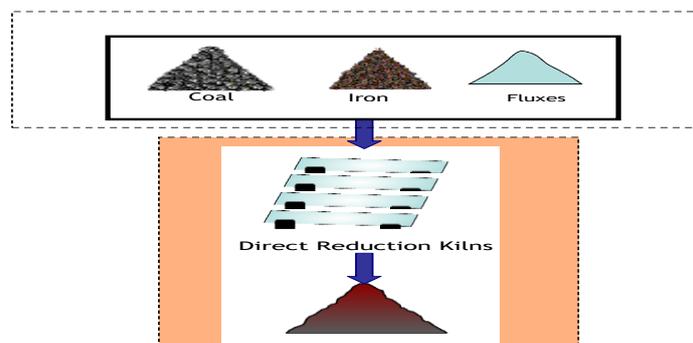
- Document review
- Compilation of audit checklist/questionnaire for site visit;
- Site Visit (Conducted on the 9<sup>th</sup> May 2018);
- Documentation Audit (9<sup>th</sup> May 2018) and
- Compilation of compliance audit report.

## 2. BACKGROUND AND PROJECT STATUS

ArcelorMittal Vanderbijlpark Works is located at Delfos Boulevard, Vanderbijlpark, on the remaining extent of Portion 1 of the Farm Vanderbijlpark 550 IQ. The site falls within the jurisdiction of the Emfuleni Local Municipality, Gauteng Province. The facility is an integrated Iron and Steel Manufacturer which produces on average 3,5 million tons liquid steel per annum.

The Direct Reduction (DR) route is an alternative iron making route, which utilizes coal to reduce the iron ore. At Vanderbijlpark Works, six rotary kilns are used to heat iron ore, coal and additives to produce sponge iron, which is then utilized in an electric arc furnace or Basic Oxygen Furnace.

The waste gases from the process are drawn off the process and sent through a waste heat boiler to generate process steam. Dust particles are removed from this waste gas stream in the Electrostatic Precipitator (ESP), before the waste gas is discharged to atmosphere through the main stack. There is an emergency stack situated between the kiln and the boiler. This serves as a safety device for the boiler, should there be an unplanned boiler outage, and would result in pollution generation for the time that it takes to put the kiln process offline. There are presently 6 kiln / boiler trains in operation.



**Figure 1 Direct Reduced Iron (DRI) Making process**

### 3. PART 1: AUDIT INFORMATION

#### 3.1. Date of Audit

External Audit date:	- 9 <sup>th</sup> May 2018
Site audit	- 9 <sup>th</sup> May 2018
Draft Report date	- 12 June 2018
Final Report date	- 12 July 2018

#### 3.2. Audit Criteria / Scope of Work

The scope of work entailed conducting a compliance audit to verify compliance to the Environmental Authorisation (ROD) conditions as per condition 3.4.b. The annual environmental performance audit must be conducted by and independent auditor and must be submitted to the department.

The following documents were considered against which compliance to the conditions of the ROD was audited:

- Environmental Authorisation
- Amendments to the original authorisation received
- Various database monitoring results made available / presented during the audit
- Monitoring reports / data for the period for 2014 and 2015.
- Relevant communications between ArcelorMittal, Authorities and I & APs
- Applicable South African Environmental Legislation.

In light of the above, the auditor has, in addition to indicating compliance and non-compliance, ranked the specific non-compliances in terms of the following criteria:

#### **Critical Issues**

- There is a critical failure against legal requirements or management response that presents an immediate or significant risk that: Could result in prosecution and /or adverse legal finding due to failure to meet regulatory requirements;
- Could result in immediate injury or serious injury or environmental harm;
- Could result in prolonged business outage; and/or
- Could result in serious damage to the project's reputation.
- Critical issues must be addressed immediately and all activities resulting in negative critical findings must cease until such time as the issue has been rectified.

#### **Moderate Issues**

- There is a substantial failure to meet the environmental requirements for the project,
- There is a possibility of substantial environmental degradation and/or pollution and/or
- Objective evidence was observed raising doubt as to the integrity of data or records inspected.

#### **Minor Issues**

- Isolated observations demonstrating that full compliance to the environmental requirements on site have not been, or will not be, fully achieved.
- No physical environmental harm

**Historic Issues**

- No physical environmental harm – administrative in nature
- Historic non-compliance, out the company currently in control of compliance control
- No administrative or other remedy available to rectify the situation
- No further action required

**3.3. Objectives**

To carry out an independent compliance audit including:

- Inspection of operations and confirm compliance to the Authorisation
- Inspection of operations and confirm compliance to the approved amendments
- Verify the effectiveness of impact management and mitigation.
- Assess allocations of responsibilities and actions.
- Report observations for further investigation and action.
- Specifically state whether conditions are adhered to.
- Make recommendations where appropriate.
- Prepare an audit report for submission to the relevant authorities.

The report will further seek to specify target dates for the implementation of the recommendations by ArcelorMittal to achieve recommendations regarding non-compliances or potential non-compliances and will specify target dates for the implementation of the recommendations by ArcelorMittal and whether previous corrective actions taken for non-compliance was adequate; and illustrate monitoring results graphically and conduct trend analysis.

**3.4. Independent Assessor**

The role of the Independent Environmental Assessor is to provide independent, objective and professional advice on the environmental compliance of the DR Kilns Project, with specific reference to the respective ROD conditions. Specific duties of the auditor include the following:

- Review and assess in an independent, objective and professional manner all aspects related to the ROD conditions;
- Conduct a random site inspection if deemed necessary; and
- Provide feedback on the assessment results to ArcelorMittal.

**3.5. Comments from previous audit reports**

The Table below indicates the problems identified and the current status;

External Audit Report 2017 - GCS	Current Status – 2018 Audit
Continuous mass flow data was not available and an amendment to the condition was recommended	The continuous analysers are maintained on a regular basis but their availability is not always reliable. An amendment application is recommended to align all monitoring conditions with the AEL.

### 3.6. Statement of Compliance

ArcelorMittal is generally compliant to the conditions of the Environmental Authorisation GAUT 002/04-05/1781, dated 22 February 2007 as amended in 2009 and 2011.

The main concerns raised during the audit was the Sulphur Dioxide load recorded from the works. Condition 3.2.n required certain emission reductions to be achieved at certain stages. The requirements were met by ArcelorMittal. The data from the emissions inventory currently however shows that the SO<sub>2</sub> reduction is no longer achieved. According to ArcelorMittal it is partly due to the changes made how they calculate the SO<sub>2</sub> load. The calculations and inventory scope improved overtime and the recorded increase is therefore partly as a result of the way in which the figure is calculated. The emission reduction project specified in the Emission Reduction Strategy should be implemented as per the project plans.

### 3.7. Declaration

I, **Karien Zantow**, as an independent consultant compiled this audit report and declare that it correctly reflects the findings made at the time of the audit. I further declare that I,

- Act as an independent consultant;
- Do not have any financial interest in the undertaking of the activity, other than remuneration for the work performed in terms of the National Environmental Management Act, 1998 (Act107 of 1998) and the National Environmental Management Waste Act;
- Undertake to disclose, to the competent authority, any material information that has or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the National Environmental Management Act, 1998 (Act 107 of 1998);
- Based on information provided to me by the project proponent, and in addition to information obtained during the course of this audit, will present the results and conclusion within the associated document to the best of my professional judgement.



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Karien Zantow  
Environmental Specialist  
SACNASP Reg Nr 400114/14

## 4. PART 2: AUDIT FINDINGS

### 4.1. Levels of Audit Findings

In order to clarify terms and definitions with reference to the international standard ISO 19011:2002(E) Guidelines for quality and/or environmental management systems auditing - Audit "FINDINGS" are defined as "results of the evaluation of the collected audit evidence against audit criteria". The definition has a note stating "audit findings can indicate either conformity or nonconformity with audit criteria or opportunities for improvement". General or specific findings are presented as observations or opportunities for improvement. To clarify reporting - the findings will be called and presented as non-compliance, potential non-compliance and observations. These are defined as follows:

#### ***Non-compliance***

Non-compliance is the most severe type of finding. A non-compliance will indicate legal non-compliance to the relevant legislation, license and/or records of decisions conditions. Where appropriate the audit report could contain recommendations regarding non-compliance and specified/agreed target dates for the implementation.

#### ***Potential or partial non-compliance***

A potential or partial non-compliance refers to a deviation from a legal requirement, a standard specification, or a planned arrangement which does not constitute a non-compliance, but which does not represent Best Practice. Recommendations could be stated for potential non-compliances.

#### ***Observation***

An observation refers to a deviation from best practice and includes observations of opportunities for improvement. Recommendations could be stated for observations but will not have specified target dates. This has been included for the benefit of management and while not being of immediate priority, can be included in the self-improvement cycle of environmental management.

### 4.2. Audit Findings and Information Assessment

The ROD conditions were summarised in the Table below and the findings were recorded per condition. Where a non-compliance is raised the intensity is categorised.

**Table 1 Authorisation Conditions Assessment and Compliance**

Condition Nr	Condition as in ROD	Observation / Comments	Compliance status	Intensity of non-compliance
<b>3.2</b>	<b>Specific Conditions</b>			
i.	This Department will hold ArcelorMittal Steel Vanderbijlpark Steel liable for any damages that may be caused to the environment as a result of any activity related to the proposed project.	Noted	N/A	
ii.	Authorisation is only granted for 2 (two) additional kilns based on the SL/RN coal based technology with a maximum combined DRI production capacity of 350 000 t/a.	The technology was confirmed on site. The actual production is far below the requirements.	Compliant	
iii.	A project schedule with timeframes must be submitted to the Department 30 (thirty) calendar days prior to the commencement of construction activities. The schedule must clearly indicate the different phases of construction (as applicable), commissioning and start-up of production.	The Department was given written notice on the 13 <sup>th</sup> April 2007 for planned construction to commence in May 2007 for kiln #5 and #6. Attached to the notification was an updated project schedule as required.	Compliant	
iv.	The Department must be informed at least 30 (thirty) calendar days prior to the commissioning of the proposed DRI kilns #5 and #6.	<p>The Department was given written notice on the 4<sup>th</sup> September 2008 of the cold commissioning of kiln #5 and #6. Cold commissioning is only an operational test and is not the final commencement of production.</p> <p>On the 27<sup>th</sup> January 2009, the department was notified that construction was in the final phase for kiln #5 and #6. The commencement of hot commissioning of kilns #5 and #6 was to follow in the next 30 days. Hot commissioning is only an operational test and does not yet mark the final production phase.</p> <p>On the 4<sup>th</sup> March 2009 written notice was again given to the Department for the planned commissioning of production of kiln # 6 on the 27<sup>th</sup> March 2009 at ArcelorMittal Vanderbijlpark Works. It was also</p>	Compliant	

Condition Nr	Condition as in ROD	Observation / Comments	Compliance status	Intensity of non-compliance
		<p>stated in this notice that kiln #5 would only be commissioned end of May 2009.</p> <p>On 19<sup>th</sup> June 2009 ArcelorMittal requested permission for the commissioning of kiln #5 and #6.</p>		
v.	<p>Final design plans for the site layout must be provided 30 (thirty) calendar days prior to the commencement of construction.</p> <p>i. The design is subject to provisions for optional retrofitting further pollution abatement technology should that be required to further reduce emissions from the proposed development.</p> <p>ii. The above design plans must include information on specific pollution prevention measures (e.g. after-burner-chamber, high pressure boiler, electrostatic precipitators etc.) and compliance with relevant SANS standard, as applicable.</p>	<p>The Department was given written notice of construction on 13<sup>th</sup> April 2007. Attached to the notice was a complete site layout drawing as requested, along with an updated project schedule, Environmental Management Plan for the construction phase and an emissions compliance reporting structure.</p>	Compliant	
vi.	<p>An auditable Preventative Maintenance Plan must be developed to ensure that all environmentally critical equipment such as fume extraction, off-gas treatment equipment, energy recycling systems, seals of feed inlet and output outlets, stack monitoring equipment etc. are maintained as required. A discussion on the implementation of and compliance with the maintenance plan must be included in the annual audit report.</p>	<p>A full maintenance plan is in place at ArcelorMittal Vanderbijlpark Works. A sample was verified during the audit period and found to be in place. Refer to Annexure B.</p>	Compliant	
vii.	<p>A detailed environmental Management Plan (EMP) for the implementation of the project must be submitted to the Department for approval 30 (thirty) calendar days prior to</p>	<p>An updated EMP (dated July 2010) was submitted to the department. Approval of the EMP and all commitments and recommendations was received by the Department on the 19<sup>th</sup> November 2010.</p>	Compliant	

Condition Nr	Condition as in ROD	Observation / Comments	Compliance status	Intensity of non-compliance
	<p>the commencement of construction activities. the EMP must specifically include <i>inter alia</i>:</p> <ul style="list-style-type: none"> <li>i. An auditable plan for monitoring all facets of the DRI kiln #5 and #6 project implementation and operation, including compliance monitoring with the conditions of this authorisation and recommendations of the environmental Impact Report.</li> <li>ii. Procedures for the monitoring of noise to ensure compliance with the Gauteng Noise Control Regulations and relevant requirements of the Occupational Health and Safety Act.</li> </ul>			
h.	MSVS will ensure compliance with conditions of the permit of operation of Schedule Process No 30 ("APPA permit") to be issued by the Department of Environmental Affairs and Tourism (DEAT). A copy of such authorisation must be submitted to the Department 30 (thirty) days prior to the commencement of the facility.	The facility complied with the requirements. AMSA is in the process to renew the current AEL and should submit the AEL to GDARD when received.	Compliant	Observation
i.	Effluent from the DRI plant must be directed to the Main Treatment Plant and pre-treated if required for the Zero Effluent Discharge system to function optimally.	All effluent from the DRI plant is directed to the Main treatment plant where water is treated if required, thus adhering to the Zero Effluent Discharge system. At times the facility discharges effluent which forms part of the Water Use License requirements. ArcelorMittal indicated that the DR Kilns is not the major reason for the effluent discharges. This falls outside the scope of this audit but ArcelorMittal is recommended to resolve the ZED status for the Works.	Partial Compliance	Observation
j.	MSVS must investigate how to minimize water demand of the DRI plant in order to reduce fresh water intake from the Vaal Dam and Vaal River. A discussion on the	<p>ArcelorMittal Vanderbijlpark Works achieved ZED status in 2006 after the successful completion of a new water treatment plant.</p> <p>Further measures were implemented to reduce the use of water from the Vaal dam and Vaal River</p>	Compliant	

Condition Nr	Condition as in ROD	Observation / Comments	Compliance status	Intensity of non-compliance
	implementation of water recycling and reduction technologies must be included in the annual audit report.			
k.	<p>The cumulative SO<sub>2</sub> emissions must not exceed:</p> <ul style="list-style-type: none"> <li>i. 300 t/a for the combined emissions additional kilns #5 and #6; Or alternatively</li> <li>ii. 3 300 t/a for the combined emissions of kilns #1 to #6.</li> <li>iii. The emission limit must not be exceeded on a quarterly <i>pro rata</i> basis, i.e. non-exceedance of 75 t per quarter for option 3.2 (k)(i) or 825 t per quarter for 3.2 (k)(ii), respectively.</li> <li>iv. The Department must be notified 30 (thirty) prior to the construction of the kilns #5 and #6 can commence, about which of the options 3.2 (k)(i) and 3.2 (k)(ii) have been chosen by MSVS and how MSVS will ensure compliance herewith. This must include the details of the technology used to achieve SO<sub>2</sub> emission reduction as well as monitoring and reporting procedures.</li> <li>v. The annual audit report must include an independent verification of the compliance with this condition.</li> </ul>	<p>The department was notified on 13<sup>th</sup> April 2007 by ArcelorMittal Vanderbijlpark works has chosen to measure emissions according to condition 3.2 K (ii), thus representing the combined emissions for kilns #1 to #6. The emissions will be measured on an annual basis and the combined emissions of the kilns must not exceed 3 300t/a.</p> <p>Measuring of emissions for kilns #1 to #6 has taken place on a monthly basis and was below the recommended levels.</p>	Compliant	
l.	<p>An online stack monitoring system must be installed for the continuous measurement of PM 10, SO<sub>2</sub> and CO on all stacks according to condition 3.2(k)(i) or (ii), i.e. kilns #5 and #6 or #1 to #6, respectively.</p> <ul style="list-style-type: none"> <li>i. The data must be recorded as a mass concentration of the following reference conditions: 11% O<sub>2</sub>; 273 Kelvin, 101.3 KPa.</li> </ul>	<p>The facility has an online continuous analyser installed for dust as well as gas (SO<sub>2</sub>, NO<sub>x</sub> and CO).</p> <ul style="list-style-type: none"> <li>i. Data is received in the required format.</li> <li>ii. Data is in Section 5 Part 2 of the report.</li> </ul>	Compliant	

Condition Nr	Condition as in ROD	Observation / Comments	Compliance status	Intensity of non-compliance
	<ul style="list-style-type: none"> <li>ii. Mass concentrations and daily mass flows must be graphically presented in the annual audit report.</li> <li>iii. Details on the monitoring equipment i.e. direction limit, drift, span and accuracy must be submitted to the Department 30 (thirty) days prior to commissioning of the proposed development.</li> <li>iv. The monitoring equipment must be maintained and calibrated according to the manufacturers' specification. A maintenance register must be kept updated. These records must be made available to the Department within 14 (fourteen) calendar days upon written request by the Department.</li> <li>v. A Quality assurance and Quality control plan for the monitoring equipment must be implemented and submitted to this Department with the first annual audit report.</li> <li>vi. This is not withstanding any additional conditions the Department of Environmental Affairs and Tourism might set in the permit for the operation of the scheduled process no 30. Reports on the results of this monitoring must also be submitted to this Department with the annual audit report.</li> </ul>	<ul style="list-style-type: none"> <li>iii. Information was sent accordingly</li> <li>iv. The Kilns instruments were</li> <li>v. calibrated in 2017 . The facility has a maintenance contract in place with a third party contactor to maintain the instruments and conduct maintenance. The registers were verified during the audit.</li> <li>vi. The QAQC plan was submitted</li> <li>vii. The AEL requirements are set out in Section 4 Part 2 of the Report. Data submitted</li> </ul>		
m.	<p>An isokinetic stack monitoring campaign must be conducted in line with the AEL monitoring requirements on all stacks according to condition 3.2(k)(i) or (ii), i.e. kilns #5 and #6 or #1 to #6, respectively. The results must be submitted with the annual audit report.</p> <p>(Amended December 2011)</p>	<p>The monitoring according to the AEL was verified and is compliant to the emission standards. Refer to Annexure C.</p>	Compliant	

Condition Nr	Condition as in ROD	Observation / Comments	Compliance status	Intensity of non-compliance
n.	<p>An emissions reduction strategy (ERS) for all operations on the Vanderbijlpark works must be developed in order to significantly decrease the contribution of MSVS to ambient air concentrations in the receiving environment.</p> <ul style="list-style-type: none"> <li>i. An updated emissions inventory of all point, mobile and fugitive source of emissions must be developed and updated bi-annually.</li> <li>ii. The ERS must include timeframes and committed reduction targets for all priority pollutants, i.e. PM10, SO<sub>2</sub>, NO<sub>x</sub>, CO according to an implementation plan with milestones and deliverables over the short (6 months), medium (2 years) and long term (5 years).</li> <li>iii. The ERS must specify how the reduction in emissions will be measured and recorded.</li> <li>iv. The ERS must be submitted to the Department for approval within 6 (six) months after signature of this authorisation.</li> <li>v. The following emissions reductions must be achieved compared to the proposed emission reductions as stipulated in the draft ERS, Version 1, and the baseline of 13 630 t/a SO<sub>2</sub> and 9780 t/a PM10 in the year 2004: <ul style="list-style-type: none"> <li>A. A Minimum of 75% of the proposed emission reductions of SO<sub>2</sub> emissions, i.e. 42% or 5 724 t/a before the start-up of production of the proposed DRI kilns #5 and #6;</li> <li>B. A minimum of 65% of the proposed emission reductions of PM10 emissions, i.e. 48% or 4 618 t/a before start-up of production of the proposed DRI kilns #5 and #6;</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>i. The inventory was updated as required in June 2017 and December 2017.</li> <li>ii. An Emissions reduction strategy (ERS) contains all requirements set forth in the ROD.</li> <li>iii. An Emissions reduction strategy (ERS) contains all requirements set forth in the ROD. The emission reductions are set out in Section 5 Part 2 of this Report.</li> <li>iv. The ERS has been submitted to GDARD</li> <li>v. An annual report and confirmation of the required SO<sub>2</sub> reduction for the operation of two additional kilns #5 and #6 at ArcelorMittal Vanderbijlpark works, dated 20 July 2010 was accepted. The Department was satisfied with all conditions set forth in the RoD as being met.</li> </ul> <p>The information is set out in Section 5 Part 2 of this Report. The dust and SO<sub>2</sub> load reduction has been achieved. The SO<sub>2</sub> load reduction however is no longer maintained. ArcelorMittal indicated there are various reasons for this;</p> <ul style="list-style-type: none"> <li>• Inventory calculations changed which resulted in a calculated increase. If the change is allowed</li> </ul>	Complaint	

Condition Nr	Condition as in ROD	Observation / Comments	Compliance status	Intensity of non-compliance
	<p>C. A minimum of 75% of the proposed reductions of PM10 emissions, i.e. 54% or 5 329 t/a at the latest 12 (twelve) months after the start-up of production of the proposed DRI kilns #5 and #6.</p> <p>vi. The annual audit report must include the review of the ERS implementation (targets, achieved emission reduction per pollutant, next implementation step and remediation measures should a target not have been met within the proposed timeframe). The audit results must be submitted to the Department 30 (thirty) calendar days prior to start-up of production of the DRI kilns #5 and #6 and with the annual audit reports thereafter.</p>	<p>backwards, the increased calculated load will also increase.</p> <ul style="list-style-type: none"> <li>The COCGAW project is no longer operational due to technical difficulties.</li> </ul> <p>The ERS and progress to the planned projects have been stated in this report.</p>		
o.	<p>The operations of the DRI kilns #5 and #6 and the DRI plant as a whole must comply with the Occupational Health and Safety Act (No. 85 of 1993) and sound occupational hygiene procedures. Engineering control measures must be implemented as first choice of mitigation.</p>	<p>Health and Safety procedures are in place and part of the management system. ISO 18001 certification was maintained in 2017.</p>	Compliant	
p.	<p>The recommendations contained in the specialist studies submitted in support of the application for authorisation of the DRI kilns #5 and #6 project are regarded as an extension of the conditions of this authorisation. Implementation of or compliance with these recommendations must be discussed as part of annual environmental performance audits.</p>	<p>Refer to Section 5, Part 2 of this report. The non-compliance relates the non-operation of the Coke Oven Clean Gas plant due to technical difficulties.</p>	Partial Compliance	Moderate
q.	<p>The Department of Water Affairs and Forestry's and Department of Environmental Affairs and Tourism</p>	<p>None were set as far as the information we reviewed.</p>	Compliant	

Condition Nr	Condition as in ROD	Observation / Comments	Compliance status	Intensity of non-compliance
	requirements and / or conditions pertinent to the proposed project must be complied with.			
r.	All potential emergencies that can be expected from the DRI kilns #5 and #6 project must be anticipated and the reaction thereto must be incorporated in the existing Mittal Steel emergency response procedures.	A complete and up to date Emergency Preparedness plan is currently in use at ArcelorMittal Vanderbijlpark works. The Emergency Preparedness Plan is currently under review.	Compliant	
s.	Detailed and up to date records must be kept of all incidents and complaints pertaining to the DRI kilns #5 and #6 project, how these were managed and the recurrence thereof prevented. These records must be made available to the Department within 14 (fourteen) calendar days upon written request by the Department.	No incidents relating to kiln 5 and 6. ArcelorMittal indicated that they comply with data requests made by the Department.	Compliant	
t.	This Department, the Department of Environmental Affairs and Tourism and the Department of Water Affairs and Forestry must be informed of any environmental and pollution incidents relating to the DRI kilns #5 and #6 project within 24 (twenty four) hours of such incidents occurring	No incidents reported during the audit period relating directly to the Kilns.	Compliant	
u.	An environmental Control Officer (ECO) to be appointed must ensure that regular audits are performed before, during and after construction and commissioning of the facility as stipulated in the EMP to ensure implementation of mitigation and management measures. Furthermore, an ECO must monitor the applicant's compliance with all the conditions of this authorisation.	An appointment letter was presented as evidence. Ilze Broekman was appointed as ECO	Compliant	
<b>3.3</b>	<b>General Conditions</b>			
a.	Any changes to, or deviations from the project description set out in this letter must be approved in writing by the	No deviations were made	Compliant	

Condition Nr	Condition as in ROD	Observation / Comments	Compliance status	Intensity of non-compliance
	<p>Department before such changes or deviations may be effected. In assessing whether to grant such approval or not, the Department may request such information as it deems necessary to evaluate the significance and impacts of such changes or deviations.</p>			
b.	<p>This Department may review the conditions in this letter from time to time and may, in notice in writing to the applicant, amend, add or remove a condition.</p>	Noted	N/A	
c.	<p>The applicant must notify the Department at least 10 (ten) days prior to the change of ownership, project developer, or the alienation of any similar rights for the activity described in this letter. The applicant must furnish a copy of this document to the new owner, developer or person to whom the rights accrue the conditions contained herein are binding on them.</p>	Noted	N/A	
d.	<p>Where any of the applicants contact details change, including the name of the responsible person, the physical or postal address and or telephone details the applicant must notify the Department as soon as the new details become known to the applicant.</p>	Noted	N/A	
e.	<p>Authorisation for the activity is granted in terms of the Environmental Conservation Act 1989, (Act 73 of 1989) only and does not exempt the holder from compliance to other relevant legislation.</p>	Noted	N/A	
f.	<p>The applicant shall be responsible for ensuring compliance with the conditions contained in this letter by any person acting on his behalf including but not limited to an agent, servant, or employee or any person rendering a</p>	Noted	N/A	

Condition Nr	Condition as in ROD	Observation / Comments	Compliance status	Intensity of non-compliance
	service to the applicant in respect of the activity, including but not limited to contractors and consultants.			
g.	Department officials shall be given access to the facility referred to in 1 above for the purpose of assessing and or monitoring compliance with conditions contained in this letter at all reasonable times.	Noted	N/A	
h.	The applicant must notify the department within 24 hours if any condition of this authorisation cannot or is not adhered to. The notification must be supplemented with reasons for non-compliance.	Noted	N/A	
<b>3.4</b>	<b>Reporting requirements</b>			
a.	<p>A summarised bi-annual progress report on the implementation of DRI kilns #5 and #6 project must be submitted to the Department, the first report due 3 (three) months after construction commences and every 6 (six) months thereafter, until commissioning of the DRI kilns #5 and #6 including associated infrastructure has been finished. These progress reports must address, inter alia:</p> <ul style="list-style-type: none"> <li>• A summary of the implementation of the Emission Reduction Strategy up to then (see 3.2 (n)).</li> <li>• Records of any major incidents (see 3.2 (t))</li> <li>• Commissioning and decommissioning of infrastructure (if any), including associated infrastructure for materials handling.</li> <li>• Monitoring of activities in terms of the Environmental Management Plan.</li> </ul>	The summarised bi-annual progress report on the implementation of DRI kilns #5 and #6 are compiled internally and filed.	Compliant	

Condition Nr	Condition as in ROD	Observation / Comments	Compliance status	Intensity of non-compliance
	<ul style="list-style-type: none"> <li>Any steps taken to rectify areas of non-compliance with environmental requirements.</li> </ul>			
b.	<p>An annual environmental Performance Audit conducted by an independent accredited auditor must be submitted to the Department for review, the first audit being due 12 (twelve) months after start-up of production of the DRI kilns #5 and #6 project. The annual audit must include, inter alia, the following</p> <ul style="list-style-type: none"> <li>All information as required in 3.2, 3.3 and 3.4 (a)</li> <li>Log of wastes that were generated and where they were disposed of or recycled on site</li> <li>A summary of all findings above</li> <li>Recommendations for improvement of the environmental performance of the DRI kilns #5 and #6 project, including timeframes and responsibilities.</li> </ul>	<p>An external audit report was submitted 26 June 2017 which was drafted by GCS Environmental Consultants and no findings were raised.</p> <p>This Audit Report contains the required elements.</p>	Compliant	
<b>3.5</b>	<b>Duration of authorisation</b>			
	<p>If the activity authorised by this letter does not commence within 2 (two) years from the date of signature of this letter, the authorisation will lapse and the applicant will need to reapply for authorisation in terms of the above legislation or any amendments thereto.</p>	<p>The activity commenced in the required timeframe.</p>	Compliant	
<b>4.</b>	<b>Consequences of non-compliance</b>			
	<p>The applicant must comply with the actions set out in this letter. Failure to comply with any of the above conditions may result in, inter alia, the Department withdrawing the authorisation, ... enforce compliance.”</p>	<p>Noted</p>	N/A	

## 5. SPECIFIC CONDITIONS

### 5.1. Preventative Maintenance Plan

ArcelorMittal South Africa Vanderbijlpark Works make use of an electronic computer based maintenance system called SAP for the maintenance of environmental critical equipment at Kilns #5 and #6. The system includes all equipment, working parts and plant components that must be maintained to ensure responsible environmental management.

The system is operated by a systems planner who manages and updates the system on a regular basis. All equipment and working parts that need regular maintenance are pre-loaded onto the SAP system according to manufactures specifications and best practice. The SAP then automatically provides the operator with detail relevant to the service intervals of certain components within the plant.

During the audit a sample of the maintenance register was reviewed of a maintenance activity that took place at Kilns #5 and #6 ESP. From the review of the job card, it would appear that the system is being implemented. The facility has a maintenance budget and expenditure and orders against the budget was available as proof of on-going maintenance and repairs.

Refer to Annexure B for the maintenance job card selected during the audit.

### 5.2. Implementation of water recycling and reduction technologies

ArcelorMittal South Africa Vanderbijlpark works reportedly has made a number of operational design changes in Kilns # 5 and #6 to reduce freshwater consumption from the Vaal dam. To summarise, these include:

- Steam condensate from the power plant is vented back to the Demin Plant for re-use;
- Recycled waste gas is used at the kilns After Burner Chambers (ABC) for temperature control instead of water;
- By using mechanical side stream filters instead of sand filters;
- The cooling water used for bearings at boilers #5 and #6 was vented to the power plant cooling tower to be re-used as make-up water; and
- The water cooled hangers at the core scrapers and at the inlet of coal injection of kilns #5 and #6 have been replaced by solid hangers.

ArcelorMittal has a Water Use Licence (WUL) which allows for the abstraction of 31,025,000 m<sup>3</sup> per year for industrial purposes. The DR facility uses only a portion of this total usage and the overall usage is far below the authorised volumes.

### 5.3. Air Quality monitoring and reporting

The ROD has set out many air quality related requirements. The requirements are summarised and assessed below.

### 5.3.1. Sulphur Dioxide Emissions Load Cap

Condition 3.2 (k) sets a sulphur dioxide (SO<sub>2</sub>) emissions cap on the cumulative SO<sub>2</sub> emissions from all six (6) kilns. The emissions for all the kilns are not to exceed 3 300 tons per annum as measured on a quarterly pro-rata basis. The annual audit report must assess and confirm the correctness and compliance to this condition.

The emissions concentrations measured by ArcelorMittal was used to determine the SO<sub>2</sub> emissions load. Zantow Environmental assessed the calculated values provided and calculated the load by using two methods;

- Method 1 – Utilising actual measured values and converting the concentrations to load.
- Method 2 – Utilising the average measured values to calculate the loads taking into consideration the uptime or production time during the year.

Method 1 is considered a conservative approach and Method 2 a more realistic approach. In Method 1 the plant operational down time is not considered. However, in Method 1, where there is no concentration noted in the quarter, the entire quarter is calculated as 0 tons.

Method 2a utilises the average concentration measured for the year and then calculates the annual emissions load, taking into consideration the annual up time or production period. This is reasonable as the plant does not generate emissions if it is not operational. Using the average concentrations however might be an underestimation of the loads. At Kilns 6 for instance the SO<sub>2</sub> concentration varies significantly. Method 2b, we utilised the maximum concentration measured during the year at each kiln and then calculated the emissions load. The uptime for each kiln is then considered.

Each method utilised, has its advantages and disadvantages. Regardless of the methodology used, all methods calculated an emissions load well below the 3 300 tons per annum of SO<sub>2</sub> at the kilns.

The low production rates that the kilns contributed to this significantly.

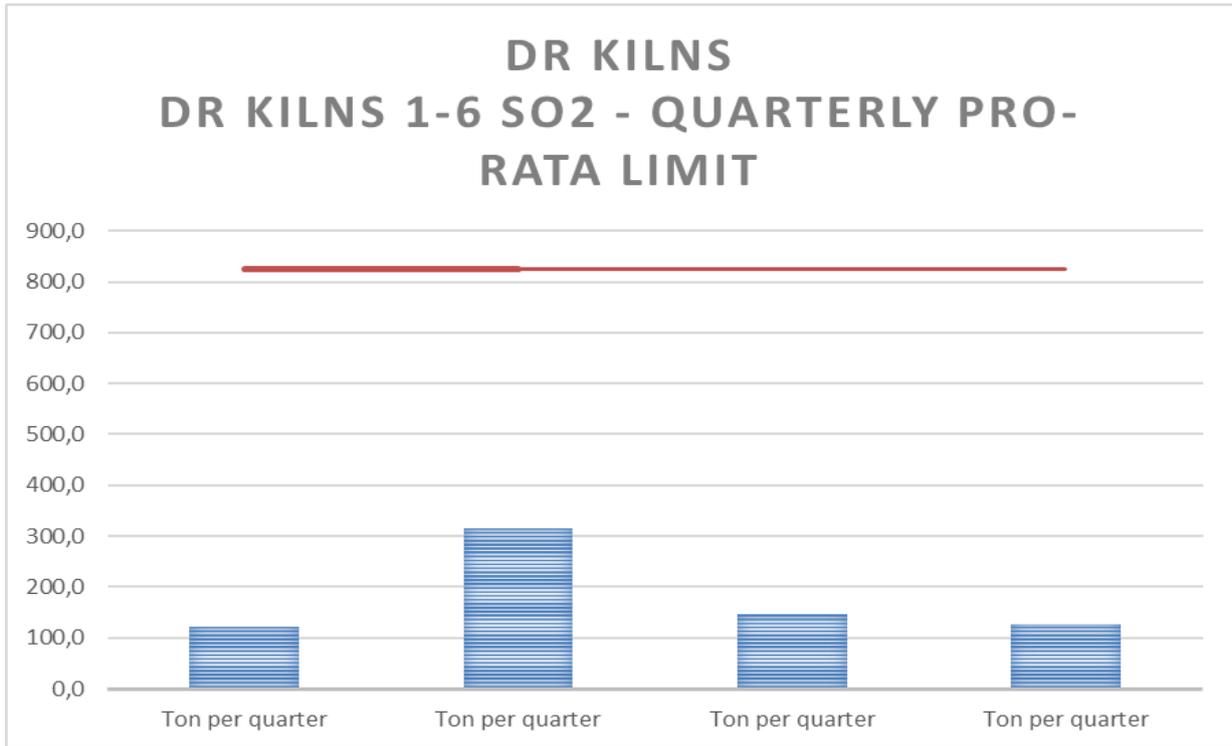
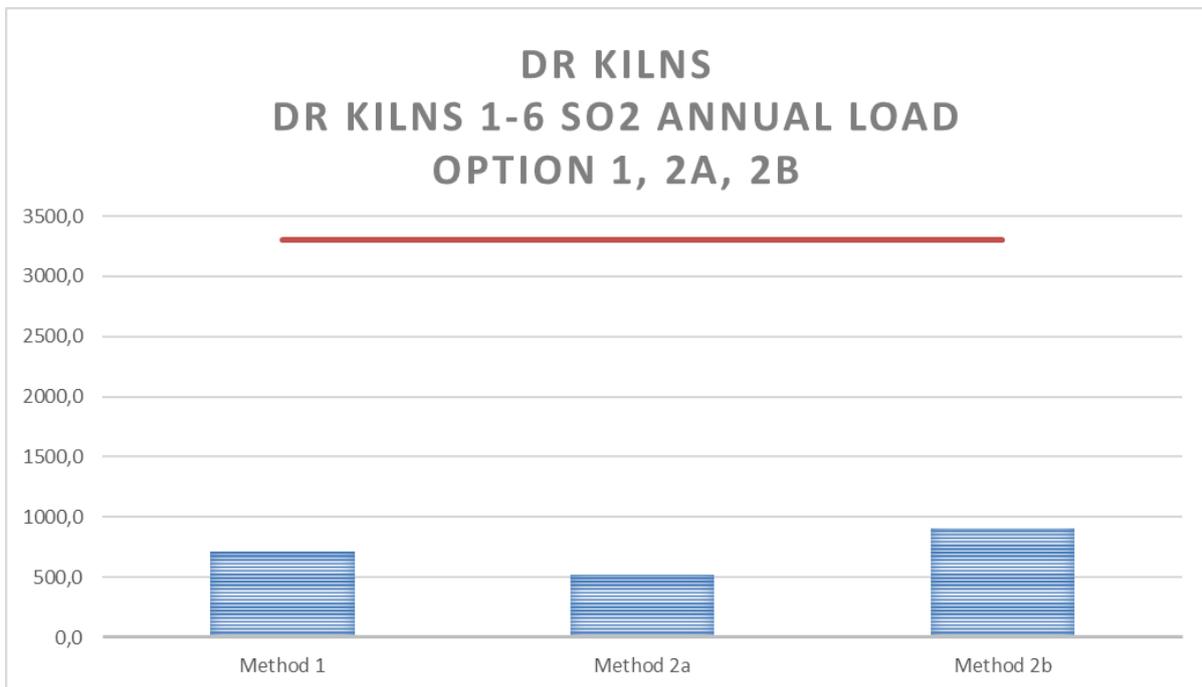


Figure 2 SO<sub>2</sub> Emission Load – Method 1



**Table 2 SO2 Emissions Load – Method 1**

Plant	Diameter	Vel (m/s)	Temp C	Pressure	Uptime	Vol flow rate Am <sup>3</sup> /s	Vol flow rate Nm <sup>3</sup> /s	SO2 Measured dust data Quarter 1	SO2 Measured dust data Quarter 2	SO2 Measured dust data Quarter 3	SO2 Measured dust data Quarter 4	SO2 Emission Rate Quarter 1	SO2 Emission Rate Quarter 2	SO2 Emission Rate Quarter 3	SO2 Emission Rate Quarter 4	SO2 Load
												Stack conc	Stack conc	kPa	annuall	
Kiln 1 ESP	2,1	0,0	0,0	0,0	0,00%	0,0	0,0	P/O	P/O	P/O	P/O	P/O	P/O	P/O	P/O	0,0
Kiln 2 ESP	2,1	0,0	0,0	0,0	0,00%	0,0	0,0	P/O	P/O	P/O	P/O	P/O	P/O	P/O	P/O	0,0
Kiln 3 ESP	2,1	16,2	173,0	85,1	38,00%	56,1	28,9	143,9	56,2	51,5	236,0	32,7	12,8	11,7	53,7	110,9
Kiln 4 ESP	2,1	18,8	201,0	85,3	57,00%	65,1	31,6	150,6	501,5	107,8	P/O	37,5	124,9	26,8	0,0	189,2
Kiln 5 ESP	2,1	18,7	230,0	85,3	57,00%	64,8	29,6	201,6	251,0	467,2	242,0	47,0	58,6	109,0	56,5	271,1
Kiln 6 ESP	2,1	12,0	176,0	85,3	61,00%	41,6	21,3	26,3	709,5	P/O	94,0	4,4	119,0	0,0	15,8	139,2
												<b>121,7</b>	<b>315,3</b>	<b>147,6</b>	<b>125,9</b>	<b>710,5</b>

**Table 3 SO2 Emissions Load – Method 2**

Plant	Diameter	Data from stack sampling		Pressure	PSD	Uptime	Vol flow rate Am <sup>3</sup> /s	Vol flow rate Nm <sup>3</sup> /s	SO2 Measured dust data Quarter 1	SO2 Measured dust data Quarter 2	SO2 Measured dust data Quarter 3	SO2 Measured dust data Quarter 4	Average SO2 Concentration	Maximum SO2 Concentration	SO2 Emission Rate Average Rate	SO2 Emission Rate Average Rate	SO2 Load % Uptime	SO2 Load % Uptime
		Stack conc	Stack conc												kPa	Fraction	annually	Stack conc
Kiln 1 ESP	2,1	0,0	0,0	0,0		0,00%	0,0	0,0	P/O	P/O	P/O	P/O	0,0	0,00	P/O	P/O	0,0	0,0
Kiln 2 ESP	2,1	0,0	0,0	0,0		0,00%	0,0	0,0	P/O	P/O	P/O	P/O	0,0	0,00	P/O	P/O	0,0	0,0
Kiln 3 ESP	2,1	16,2	173,0	85,1	0,4	38,00%	56,1	28,9	143,9	56,2	51,5	236,0	121,9	236,00	110,9	214,7	46,3	81,6
Kiln 4 ESP	2,1	18,8	201,0	85,3	0,4	57,00%	65,1	31,6	150,6	501,5	107,8	P/O	253,3	501,53	252,3	499,5	144,4	284,7
Kiln 5 ESP	2,1	18,7	230,0	85,3	0,4	57,00%	64,8	29,6	201,6	251,0	467,2	242,0	290,5	467,24	271,1	436,2	165,6	248,6
Kiln 6 ESP	2,1	12,0	176,0	85,3	0,4	61,00%	41,6	21,3	26,3	709,5	P/O	94,0	276,6	709,48	185,6	476,1	168,7	290,4
															<b>819,9</b>	<b>1626,5</b>	<b>525,0</b>	<b>905,3</b>
SO2 Cap															<b>3300,0</b>	<b>3300,0</b>	<b>3300,0</b>	<b>3300,0</b>

### 5.3.2. Stack monitoring

The ROD requires that the concentration of emissions be monitored according to the Atmospheric Emissions License (AEL) and reported on in the annual report.

Dust emissions are monitored at all the kilns with continuous analysers as required by the AEL. The dust limits imposed by the AEL is 50 mg/Nm<sup>3</sup>.

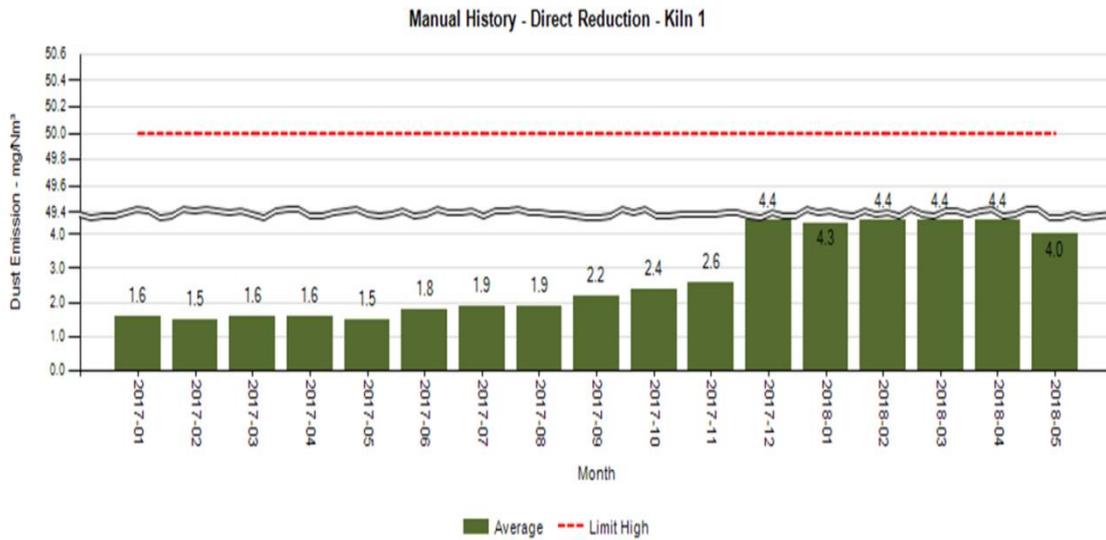


Figure 3 Kiln #1 ESP Monthly Performances

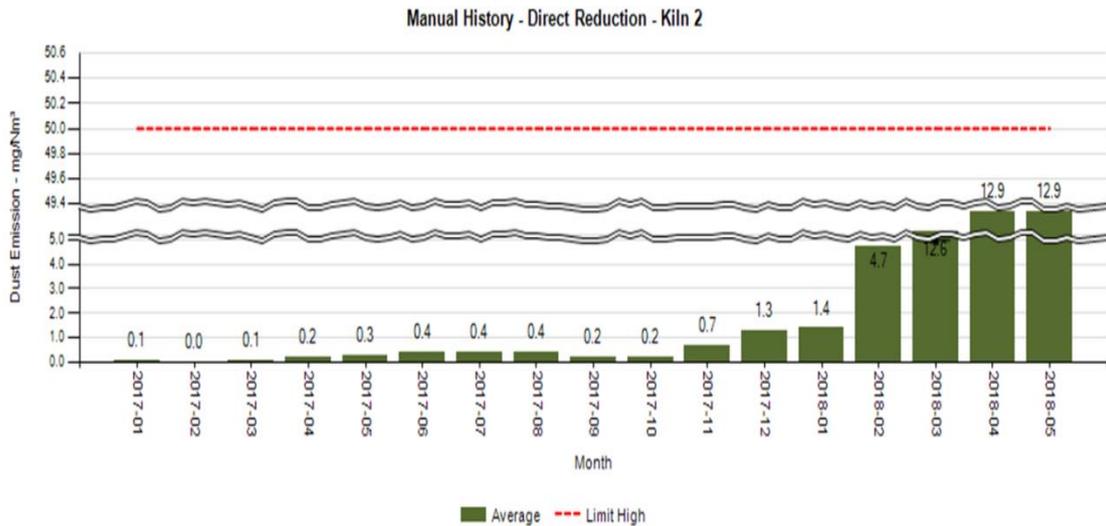
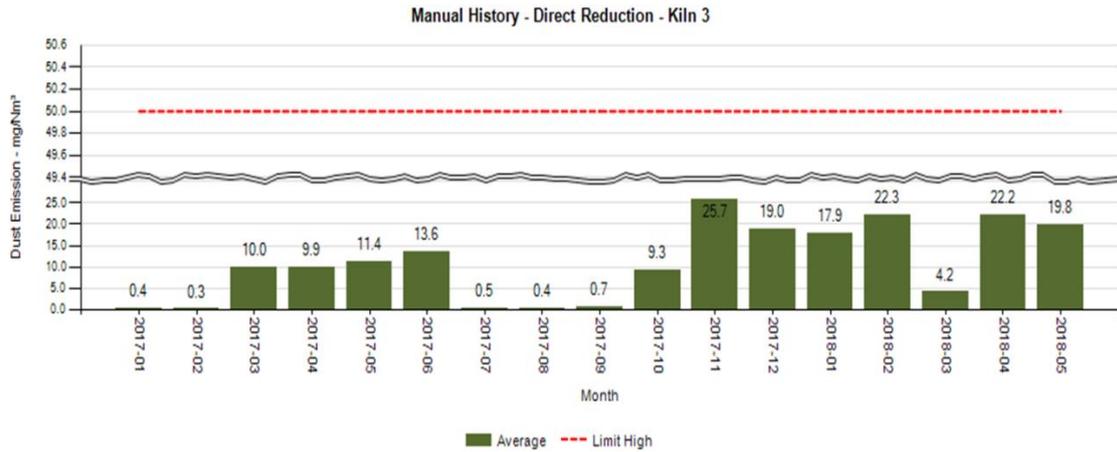
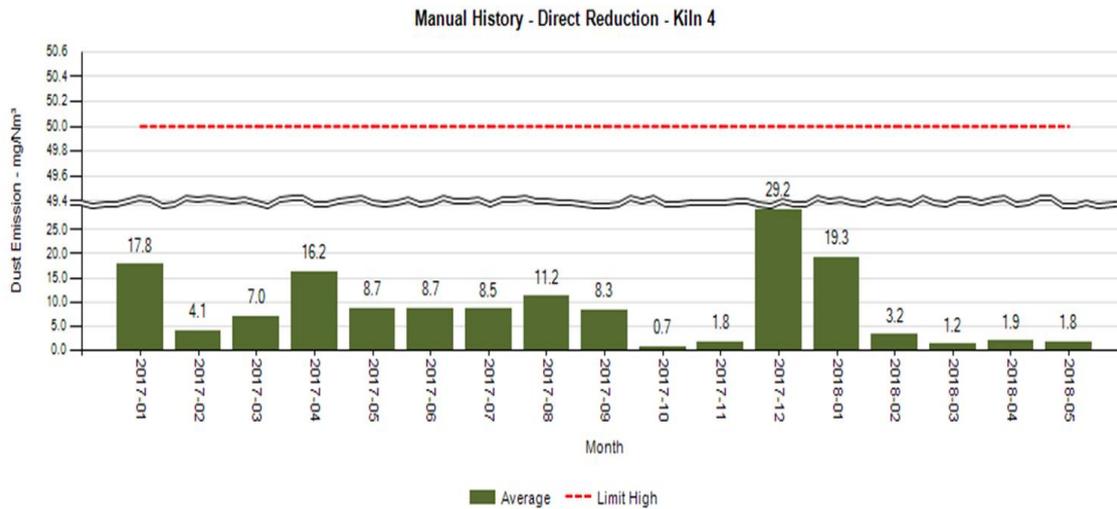


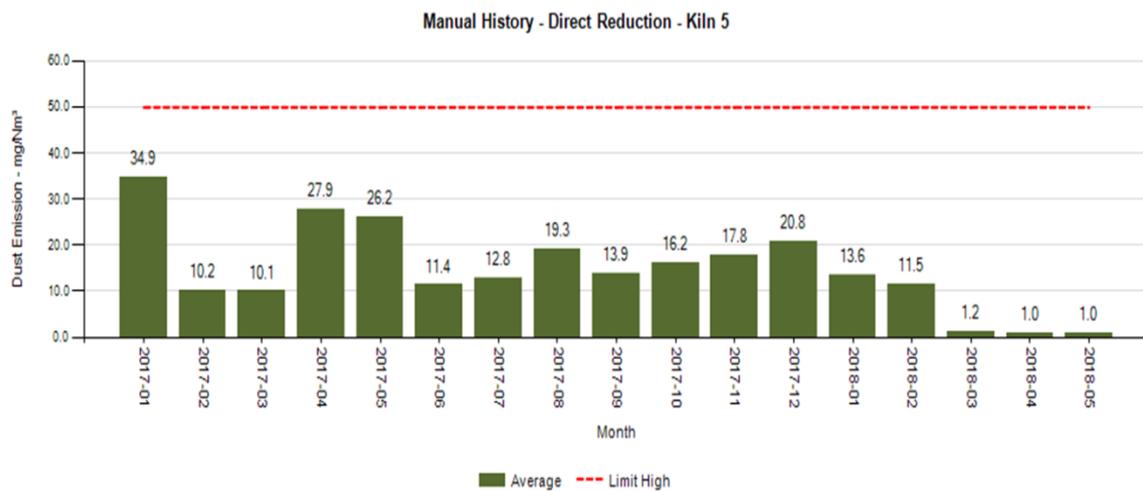
Figure 3 Kiln #2 ESP Monthly Performances



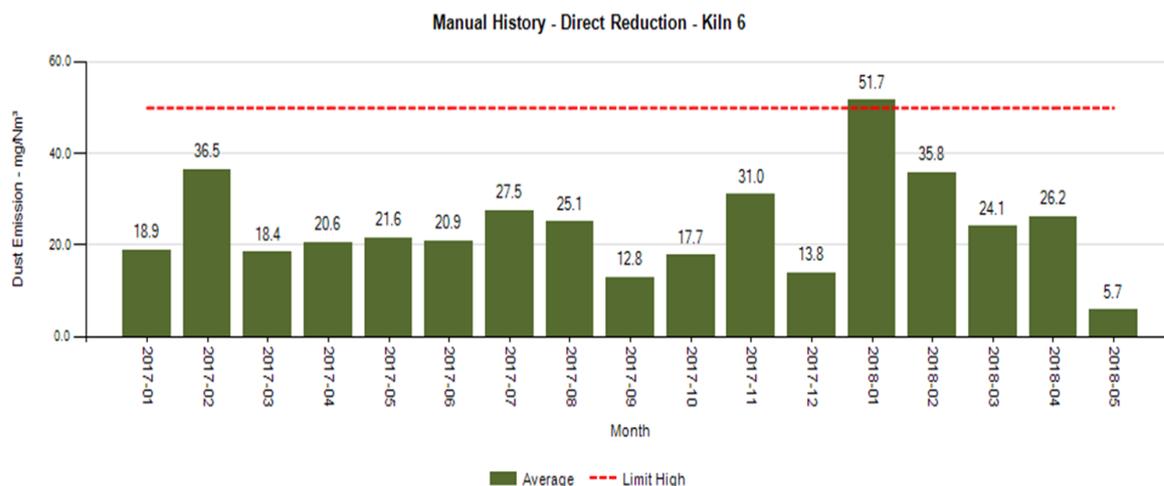
**Figure 4 Kiln #3 ESP Monthly Performances**



**Figure 5 Kiln #4 ESP Monthly Performances**



**Figure 6 Kiln #5 ESP Monthly Performances**



**Figure 7 Kiln #6 ESP Monthly Performances**

The SO<sub>2</sub> and NO<sub>x</sub> is also measured and reported quarterly and emission standards have also been set for the gasses. The facility complies with these standards.

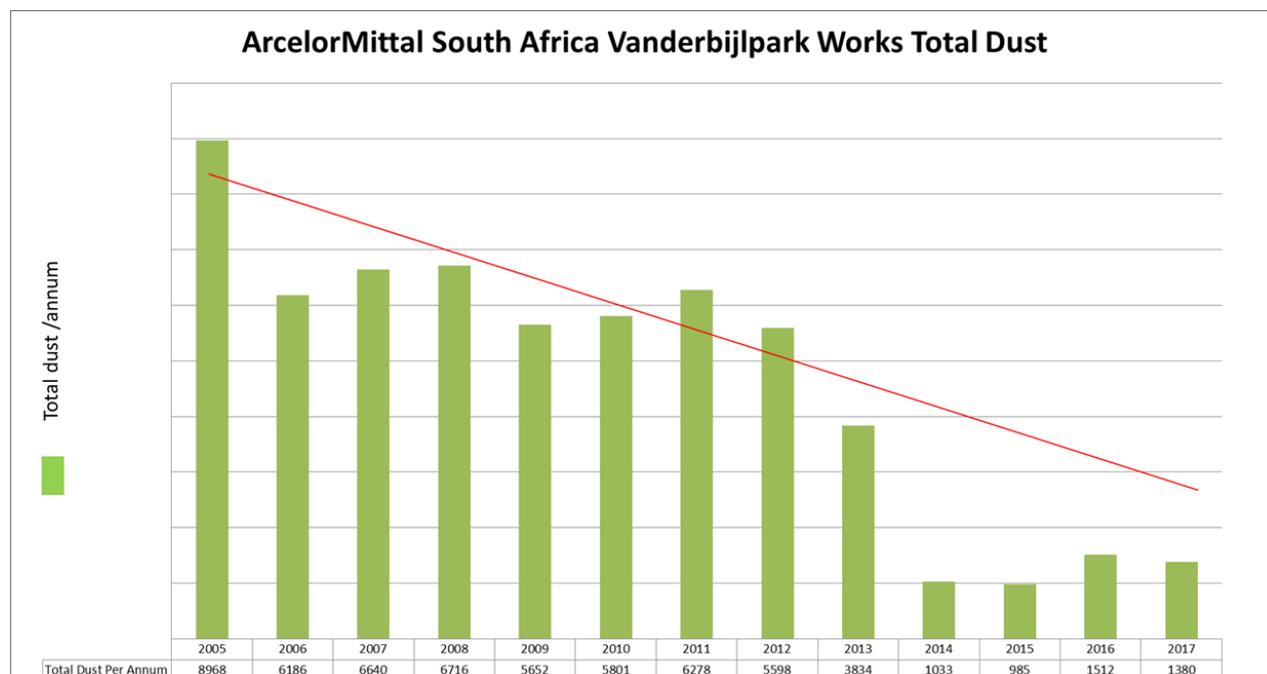
<b>ArcelorMittal Vanderbijlpark QUARTERLY EMISSION REPORT - GAS</b>					
Direct Reduction	Element	Q1 2017	Q2 2017	Q3 2017	Q4 2017
Kiln 1 ESP	SO <sub>2</sub> < 1700 mg/Nm <sup>3</sup>	P/O	P/O	P/O	P/O
	Nox < 2000 mg/Nm <sup>3</sup>	P/O	P/O	P/O	P/O
Kiln 2 ESP	SO <sub>2</sub> < 1700 mg/Nm <sup>3</sup>	P/O	P/O	P/O	P/O
	Nox < 2000 mg/Nm <sup>3</sup>	P/O	P/O	P/O	P/O
Kiln 3 ESP	SO <sub>2</sub> < 1700 mg/Nm <sup>3</sup>	143,9	56,22	51,49	236
	Nox < 2000 mg/Nm <sup>3</sup>	76,98	59,78	9,4	50
Kiln 4 ESP	SO <sub>2</sub> < 1700 mg/Nm <sup>3</sup>	150,6	501,53	107,8	P/O
	Nox < 2000 mg/Nm <sup>3</sup>	80,4	33,46	20,3	P/O
Kiln 5 ESP	SO <sub>2</sub> < 1700 mg/Nm <sup>3</sup>	201,6	250,98	467,24	242
	Nox < 2000 mg/Nm <sup>3</sup>	34,9	56,29	23,22	31
Kiln 6 ESP	SO <sub>2</sub> < 1700 mg/Nm <sup>3</sup>	26,28	709,48	P/O	94
	Nox < 2000 mg/Nm <sup>3</sup>	25,5	65,09	P/O	72

**Figure 8 Kiln #1 to #6 SO<sub>2</sub> Quarterly Gas Emissions**

The ROD required that the SO<sub>2</sub> and NO<sub>x</sub> be monitored continuously analysed data. Proof has been provided that the stack is fitted with continuous analysers.

### 5.3.3. Dust Emissions Reduction Requirement

The emissions inventory indicates the following dust reductions have been achieved to date.



**Figure 9 Total amount of dust per annum**

The ROD requires that ArcelorMittal reduce their dust load as follows;

- 48% or 4 618 tons per annum before commencement and
- A further 54% or 5 326 tons 12 months after the start-up of the Kilns

The condition is probably a mistake as the total tonnages to be reduced exceeds the baseline values. The condition states that ArcelorMittal must reduce the loads in total by 75% of the intended Emission Reductions committed to. The ROD states in condition 2.2.i that ArcelorMittal intended to reduce the dust load by 72% i.e. 7 041 tons per annum. Regardless of the exact figures, the intention of the authorities is to force ArcelorMittal to achieve an improved and reduced emissions load, which has been achieved.

ArcelorMittal reduced their dust load from the ROD baseline from 9 780 tons per annum to 1 380 tons per annum in 2017 – a total of 85% reduction and 7588 tons per annum. The facility updated the inventory in the last year with more up to date data and corrected the previous versions.

### 5.3.4 Sulphur Dioxide Emissions Reduction Requirement

The ROD requires that ArcelorMittal reduce their SO<sub>2</sub> load as follows;

- 42% or 5 724 tons per annum

ArcelorMittal reduced their SO<sub>2</sub> load from the ROD baseline from 13 630 tons per annum to 9 386 tons per annum in 2017 – a total of 32% reduction or 4 244 tons per annum. The SO<sub>2</sub> reduction was to be achieved initially due to the commissioning of the Sinter abatement equipment and the Coke Oven Clean Gas and Water Plant (COCGAW). The COCGAW plant is however not operational currently due to various technical reasons. AMSA committed the COCGAW project with the operation of 6 kilns. The last few years we have

been operating 2-3 kilns lessening the SO<sub>2</sub> load by 30% already against the target of 40%. Also, the kiln So<sub>2</sub> per annum has always been under the required limit.

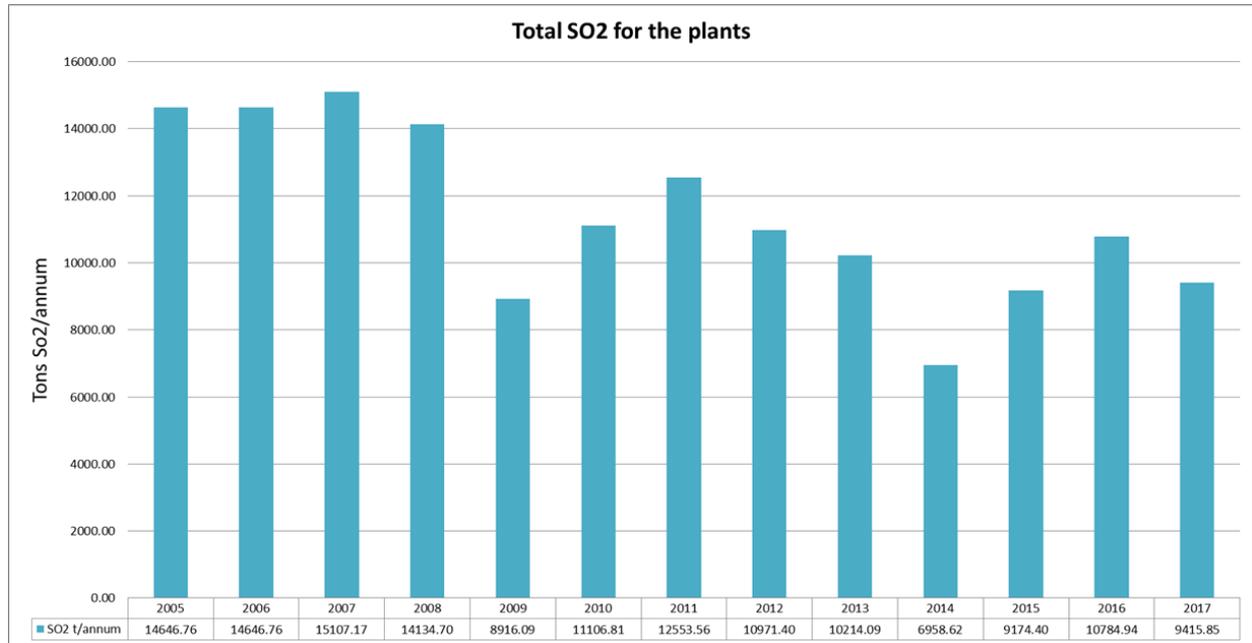


Figure 10 SO<sub>2</sub> Emissions data, Tons per Annum

### 5.3.5 Emissions Reduction Strategy

The Emissions Reduction Strategy (ERS) committed to the following emission reduction projects as discussed below. ArcelorMittal has implemented a large percentage of the projects and the reductions are evident in the inventory data. The table below sets out the emission reduction projects as per the 2007 ERS which ArcelorMittal submitted to the Department for approval at the time.

The table also then reflects the current status as has been ascertained during the audit period;

Table 4 Emission Reduction Strategy Progress

Plant	Identified Projects	Status
<b>Reduction of PM</b>		
Sinter Plant	Upgrade of Sinter AG, Sinter BG and Sinter CG Electro Static Precipitators (ESP'S) to comply with new emission limits in future.	Medium Term
	Chute and Transfer point optimization for dust reduction on conveyors R8, F2 and F10 (more conveyors to be included pending the rate and degree of success)	Short Term
	AMSA conducted an assessment on all abatement equipment to evaluate the efficiency and effectiveness of the equipment. Possible improvements have been identified and are being implemented.	Short Term
Coke Oven Plant	Implement an automated pressure control system for exhausters	Short Term

	AMSA is currently busy with the battery tightness program that will reduce fugitive emissions.	Medium Term
Direct Reduction Plant	The major concern is start-up of kilns from a cold condition. The implementation of the FACT program (a throughput / cost improvement strategy) will be instrumental in increasing the utilisation of the kilns to 95%. This will help us reduce the stack air pollution. It includes, inter alia, the following: <ul style="list-style-type: none"> <li>1. Improved maintenance plans on the abatement equipment, coupled with their ancillaries (ESPs, dome valves, etc.)</li> <li>2. Improved focus on the operation as well as maintenance of the pug mills</li> </ul>	Short Term
	Start-up requirements of the ESPs. The current directive is aimed at preventing explosions in the ESP, minimization of start-up time.	Short Term
	Dust off-loading practice. We are in the process of developing an improved plan around the off – loading areas which will minimise fugitive / secondary dust emissions.	Medium Term
	Investigations to improve ESP performance at the raw materials plant (Taaibos ESP).	Short Term
	AMSA conducted an assessment on all abatement equipment to evaluate the efficiency and effectiveness of the equipment. Possible improvements have been identified and are being implemented.	Short Term
Basic Oxygen Furnace Plant	Operational changes to keep slopping below 8%.	Short Term
	Upgrade of the existing scrubber system to reach compliance to new emission limits - 2020	Long Term
	Increase the spray of water on gravel roads.	Short Term
	Replace water supply piping	Short Term
	AMSA conducted an assessment on all abatement equipment to evaluate the efficiency and effectiveness of the equipment. Possible improvements have been identified and are being implemented.	Short Term
Blast Furnace Plant	Installed a new bag house to reduce fugitive emissions from the Blast Furnace D stock house.	Short Term
	Optimization of BF C Stock House and Cast House.	Short Term
	Dust suppression in the torpedoes during tapping.	Short Term
	AMSA conducted an assessment on all abatement equipment to evaluate the efficiency and effectiveness of the equipment. Possible improvements have been identified and are being implemented.	Short Term
Raw Materials Handling Plant	Planting of trees for wind screening at the raw material stockpiles.	Short Term
	Installation of a dust suppression water sprayer on water tankers to apply dust suppressant chemical to raw material stockpiles.	Short Term- Completed
Reducing General Fugitive PM	Rehabilitation of old Central Effluent Treatment Plant (CETP) sludge dams. The project includes rehabilitation with green area as end use.	Short Term
	Increase dust suppression on all gravel roads.	Short Term- Ongoing

	Waste site tip station was enclosed and fitted with water spraying system to minimize fugitive emissions during waste handling activity.	Short Term	Term-
	Curbing of open areas and roads with hydro seeding.	Short Term	
<b>Reduction of SO<sub>2</sub></b>			
Coke Oven Plant	The sulphur (SO <sub>2</sub> and H <sub>2</sub> S) content in the Coke Oven gas needs to be reduced by improving the efficiency of the Elemental Sulphur plant.	Short Term	
Blast Furnace & Coke Oven Plants	Will investigate and determine the feasibility to optimizing the reuse of the Blast Furnace and Coke oven gas. The investigation includes upgrade of existing gasholders and or the construction of new gasholders. The optimum reuse of gas will have a positive spin-off in two ways; lower natural gas purchasing/use and secondly improved energy use by means of internal gas combustion.	Long Term	
	The installation of new batteries will also include further gas cleaning capacity.	Long Term	
<b>Reduction of NO<sub>x</sub></b>			
Blast Furnace & Coke Oven Plants	Optimization of the Coke making gas purification plant.	Short Term	
	Investigate the optimum reuse of Coke oven and Blast furnace gas.	Short Term	

The implementation of the ERS is done in phases. The major projects that require some attention is the Coke Battery emission reduction projects as well as the Coke Oven Clean Gas and Water projects. These projects will have a significant positive effect on the reduction of the emissions load.

#### 5.4. Implementation of the specialist recommendations

During the EIA phase the various consultants and specialists made recommendations. The ROD requires that these be seen as an extension of the authorisation conditions. The information was tabled below and the current status was indicated.

**Table 5 Summary of implemented recommendations**

<b>Air Quality Specialist Report</b>	<b>Finding / Comments</b>
The Coke Plant Gas and Water Treatment Project should proceed as a priority, as this will have a significant impact on SO <sub>2</sub> reduction from the entire MSVS Works.	The gas cleaning plant was commissioned in 2010 but ceased operations in 2011 due to technical difficulties.
On-site monitoring at MSVS should continue, in order to verify the ambient concentrations predicted due to the expansion of the DR operations	The facility operates 4 ambient air quality stations
It is further recommended that the maximum zone of impact to the west of the plant be verified with monitoring conducted within that zone as well as to the south of the plant.	The facility operates 4 ambient air quality stations including the west and south
<b>Socio-economic impacts</b>	
MSVS should aim to improve training offered and skills transfer to temporary employees, especially those who are unskilled.	ArcelorMittal has a training program and invests in the up skilling of artisans and other technical staff.

MSVS should improve its corporate policy on social welfare, public relations and community development, by development of a comprehensive Corporate Social Responsibility programme, aimed mainly at benefiting local communities around MSVS.	ArcelorMittal has a CSR department and various projects were described that AMSA is participating in.
<b>Visual impacts</b>	
A stack of similar size, shape and texture to the existing stack at the DR Plant should be erected in order to maintain the appearance of MSVS in the current landscape.	A similar stack has been constructed and blends well with the other stacks.
Should further consideration be given to the Midrex option, the VIA undertaken for this EIA may have to be expanded to include consideration of the impact of a stack at the Midrex site (next to the EAFs). This would be subject to the level of concern raised in this regard by I&APs and the availability of information regarding the stack height and dimensions.	The midrex technology was not pursued
<b>Technology related impacts</b>	
Should the SL/RN process be authorised, it is recommended that indirect product cooling and a waste heat boiler with ESP and turbo alternator be implemented.	A waste heat boiler was constructed and is operated which lead to significant amounts of energy saving.
All the dust suppression, pollution abatement and waste minimization measures outlined in Section 11 should be implemented. As far as future mitigation measures still under investigation are concerned, these should be implemented, if proven feasible.	The mitigation measures were implemented.
<b>Health Risks</b>	
Future health risk assessments should be based on air quality data where the NO2 emissions are clearly defined and where the PM10 concentrations are a more accurate reflection of the emission concentration, instead of reflecting total suspended particles. This will improve the accuracy of the results.	The National Ambient Air quality standards are based on health risk assessments done on a National scale and therefore replaced the need for every facility to undertake health risks assessments. Arcelor Mittal reported that they participate in the Source Apportionment studies in the Vaal region.

## 5.5. Waste Volumes

The DR Kilns #5 and #6 form part of the existing DRI plant which consist of Kilns #1 to #6. The waste produced is therefore for the whole DRI plant and not only for kilns #5 and #6

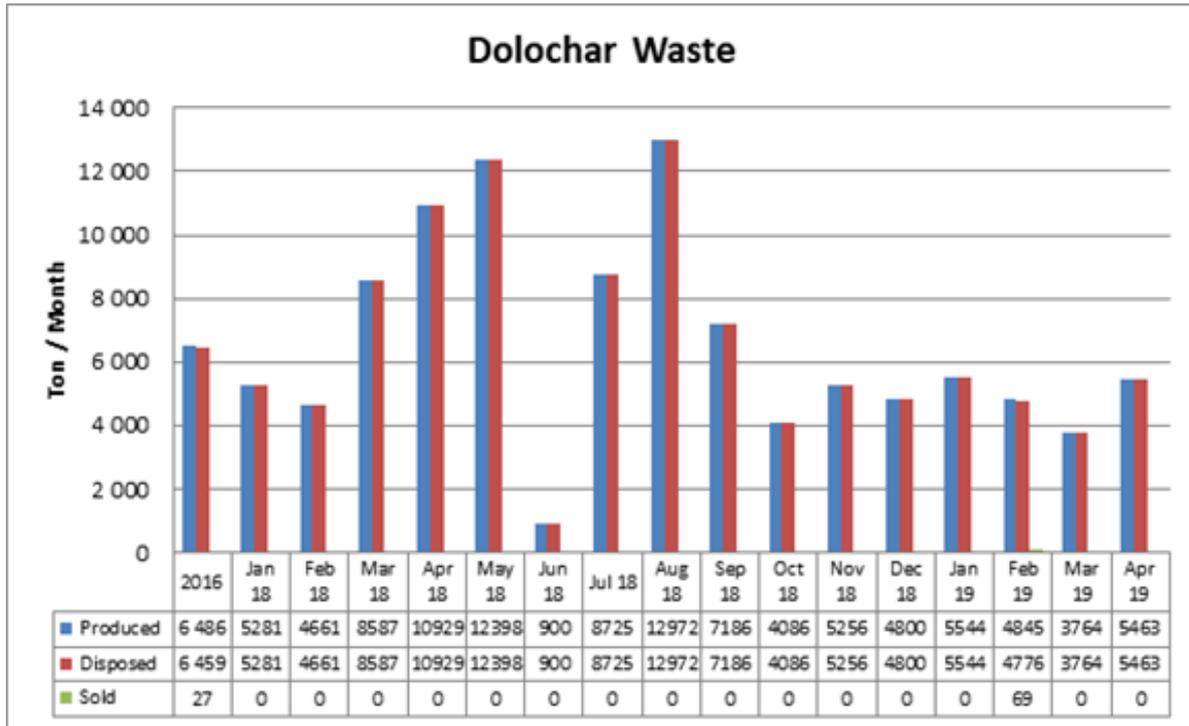


Figure 11 Dolochar Waste

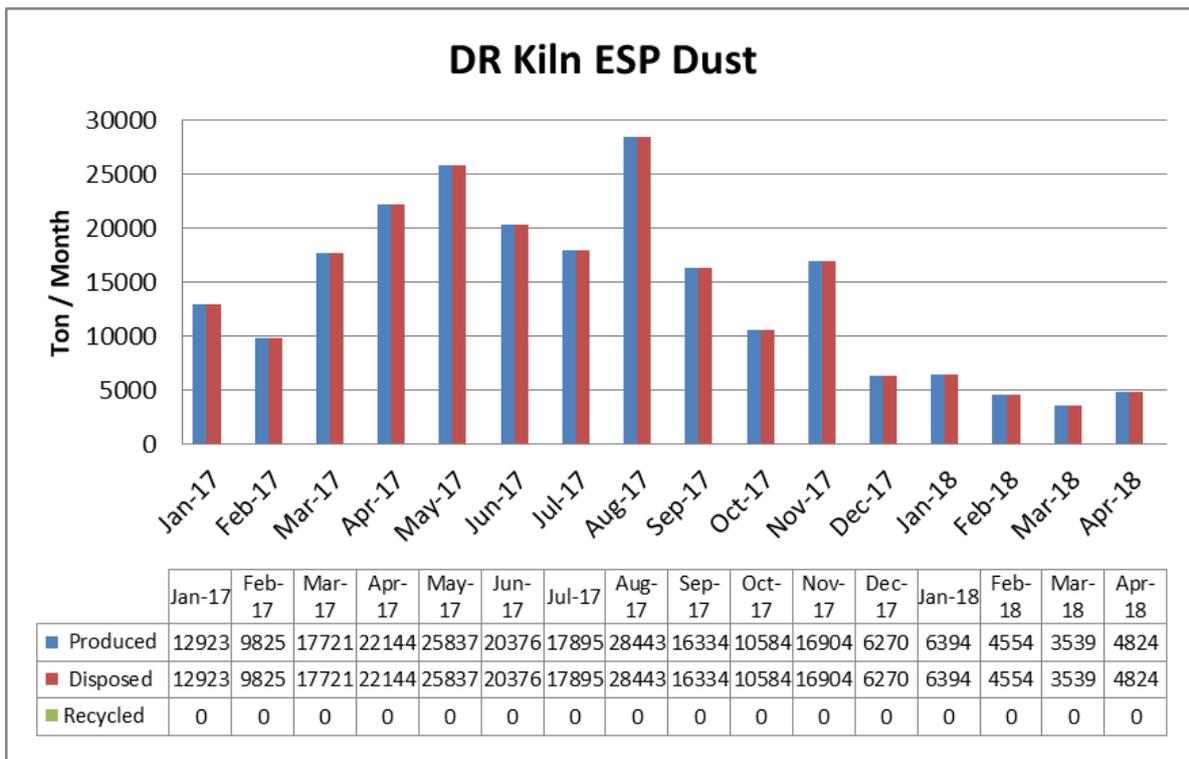


Figure 12 DR Kiln ESP Dust

A very small percentage of dolochar has been recycled and the rest was disposed at the internal waste disposal site. A carbon separation plant has been constructed to minimise and separate the carbon rich material from the iron containing dolochar. The material would have been re-used in the EAF, but the EAF was closed in 2013. Other recycling initiatives are being investigated.

## 5.6. Environmental Incident Report

ArcelorMittal utilises an electronic incident recording system for the management of incidents. A total of 10 environmental incidents were recorded at the DR plant in the audit period. None of the incidents were considered as significant by the facility and reported to the authorities.

The incident management system is well entrenched in the works and seems to be an effective tool to manage incidents.

## 5.7. Environmental Management Plan

The operational EMP was revised in July 2010 and submitted to the GDARD for approval. To date, ArcelorMittal has not had any feedback from the GDARD with regards to the approval of the revised EMP.

**Table 6 EMP Compliance**

Impact	Mitigation	Findings / Comments
Spillage of petroleum products may result in possible soil and/or surface and groundwater contamination	All oil changes; lubrication and maintenance will take place only at designated workshops.	Compliant
	All hydrocarbon contaminated PPE and absorbent material is to be disposed of in appropriate containers and waste skips (green), and subsequently disposed of at a certified hazardous waste disposal site.	Compliant
	When applicable, old oils that can be reclaimed will be supplied to the on-site contractor that manages old oils. Old oils are sold to a company that recycles the oils.	Compliant
	Any spillage will be reported immediately to the Environmental Representative and appropriate measures taken to mitigate the environmental impact; such as containment of the spillage, utilizing the appropriate spill kits, and remediation of the affected areas	Compliant
	The incident will be logged on the internal reporting system.	Compliant
	All vehicle and equipment washing will take place at designated wash bays as to ensure that wash water containing detergents and oils can be properly managed.	Compliant
Process upsets and resultant surface water contamination	All employees are to ensure that standing water in work areas is minimized.	Compliant
Oils and other chemicals can contaminate storm water. Litter and other waste can block storm	Any chemical spillages are to be adequately cleaned up directly following occurrence.	Compliant
		Compliant

Impact	Mitigation	Findings / Comments
<p>water drains. Standing water can provide breeding pools for Mosquitoes.</p>	<p>Employees are to ensure that drainage water in the plants does not become contaminated and clean run off water should be separated from dirty run off water.</p>	
	<p>All bund walls that may be damaged due to moving equipment, vehicles etc. should be repaired as soon as possible.</p>	Compliant
	<p>All necessary steps will be taken to ensure that no process water will be discharged or spilled into the storm water system. Where incidents occur in depth root cause analysis should be conducted to ensure that the problem is addressed.</p>	Compliant
	<p>The actions should make part of the environmental representatives and the plant managers' items to keep track of.</p>	Compliant
	<p>General waste is to be disposed of in appropriate waste skips (yellow)</p>	Compliant
	<p>Effluent in the form of boiler blow down will be of relatively low volumes and will be discharged to the Existing Main Treatment Plant. Effluent from Kiln 5 and 6 will not affect the optimal functioning of the Zero Effluent Discharge system.</p>	Compliant
<p>Emissions will comprise mainly of PM, SO<sub>2</sub> NO<sub>x</sub> CO and CO<sub>2</sub></p>	<p>Electrostatic Precipitator should be operated in such a way to achieve emission concentrations below 30 mg/Nm<sup>3</sup>.</p>	Compliant – According to our knowledge the AEL limit takes precedent and is set at 50 mg/Nm <sup>3</sup> . AMSA should resolve this with the Department.
	<p>A 100 m high combined stack for both kilns 5 and 6 will be used for the emissions to be released to the atmosphere. The visual impact assessment identified that this stack would not impact significantly on the receiving environment.</p>	Compliant
<p>The increase in the ambient air concentrations would be most prominent at non- occupied land east and west of the ArcelorMittal South Africa Vanderbijlpark</p>	<p>Air quality improvement projects within ArcelorMittal South Africa Vanderbijlpark Works, focusing on reducing fugitive emissions, should be continued. This is not an enhancement measure associated with the proposed activity but forms part of on-going improvement.</p>	Compliant

Impact	Mitigation	Findings / Comments
<p>Works fence line, which is owned by ArcelorMittal South Africa Vanderbijlpark Works.</p>		
	<p>Raw material handling of Iron ore, coal and dolomite offloading from rail tracks, crushing and screening to appropriate sizes and storage at separate pits and bunkers must be done in such a way to minimise fugitive emissions.</p>	<p>Compliant</p>
	<p>Appropriate measures must be taken to reduce fugitive emissions at Raw material charging and at product discharge.</p>	<p>Compliant</p>
	<p>Appropriate measures must be taken to reduce fugitive emissions at product separation and screening.</p>	<p>Compliant</p>
	<p>Appropriate measures must be taken to reduce fugitive emissions at waste dust discharge and transportation.</p>	<p>Non-Compliant</p> <p>During the audit the dust was collected by a tanker. The tanker however discharged the dust into the atmosphere and this resulted in a lot of fugitive emissions. ArcelorMittal indicated that during the audit the dust was extracted from the basement after a hopper leak. The tankers filters blocked and resulted in emissions to atmosphere. The job was stopped and the dust cleaned.</p>
<p>Any waste, if not properly managed, poses a risk to the environment.</p>	<p>Employees are to follow the general waste separation procedures of the Works, taking into consideration the 4 main waste categories, i.e. General Waste, Hazardous Waste, Metal Scrap and Dust. Any uncertainties regarding the designation of certain</p>	<p>Compliant</p>

Impact	Mitigation	Findings / Comments
<p>The transportation of materials, equipment and chemicals to and from the site shall be done in such a way as to minimize the disruption to other road users and prevent spillages.</p>	<p>All South African road usage legislation and ArcelorMittal South Africa Vanderbijlpark Works traffic rules will be complied with, as appropriate.</p>	<p>Compliant</p>
	<p>All vehicles travelling to and from the site will use only the access roads designated by ArcelorMittal South Africa Vanderbijlpark Works for this purpose.</p>	<p>Compliant</p>
	<p>All vehicles will be maintained according to manufacturer's specifications, and must comply with South African legislation as a minimum.</p>	<p>Compliant</p>
	<p>Loads will be loaded and contained in such a way as to prevent spillage on roads.</p>	<p>Compliant</p>
<p>Safe working</p>	<p>ArcelorMittal South Africa Vanderbijlpark Works has a safety and security procedure that will be followed by all Contractors transporting materials, including chemicals, to and from site. The operation of the Kilns must comply fully with the Occupational health and safety system</p>	<p>Compliant</p>
	<p>All employees and contractors are to make use of the appropriate PPE for the required task.</p>	<p>Compliant</p>
	<p>Employees and personnel of contractors will undergo appropriate training before performing any task on site.</p>	<p>Compliant</p>
<p>Abnormal conditions</p>	<p>Procedures in the Environmental Emergency Plan should be followed in the event of emergency situations.</p>	<p>Compliant</p>
<p>Air Quality</p>	<p>Monitoring program Continuous monitoring of PM and SO<sub>2</sub> and CO</p>	<p>Compliant – Observation Recommended that monitoring requirements be aligned with the AEL to avoid conflicts in the requirements.</p>
<p>Water</p>	<p>Surface water and ground water monitoring will be conducted as per the applicable Water Use license issued by the Department of Water Affairs and Forestry.</p>	<p>Compliant</p>
<p>Waste</p>	<p>The waste volumes generated will be logged and proof thereof is available.</p>	<p>Compliant</p>
<p>EMP deviations</p>	<p>Records will be kept of all deviations from the EMP and reported by the Environmental Representative, on a monthly basis, to the ArcelorMittal South Africa Vanderbijlpark Work's Environmental Management Department.</p>	<p>Compliant</p>

## 6. CONCLUSION AND RECOMMENDATIONS

Condition 3.4 (b) of the ROD, requires that an annual Environmental Audit be undertaken by an independent external auditor and the audit report submitted to the GDARD. This report is the seventh audit report in fulfilment of this requirement.

Table 1 set out the compliance with the authorisation conditions and were non-compliances where recorded, the auditor contextualised the non-compliance in terms of the intensity. This equates to an objective view of the seriousness of the non-compliance and also then leads to recommendations where moderate to critical non-compliances have been observed.

In general, ArcelorMittal is compliant with the authorisation conditions. The main concerns raised during the audit was the Sulphur Dioxide load recorded from the works. Condition 3.2.n required certain emission reductions to be achieved at certain stages. The requirements were met by ArcelorMittal. The data from the emissions inventory currently however shows that the SO<sub>2</sub> reduction is no longer achieved. According to ArcelorMittal it is partly due to the changes made how they calculate the SO<sub>2</sub> load. The calculations and inventory scope improved overtime and the recorded increase is therefore partly as a result of the way in which the figure is calculated. The emission reduction project specified in the Emission Reduction Strategy should be implemented as per the project plans.

---End---