European Investment Bank

CM Complaints Mechanism

Complaints Mechanism - Complaints Mechanism - Complaints Mechanism - Complaints Mechanism

Mozal Aluminum Smelter

Mozambique

Complaint SG/E/2010/16

FOLLOW-UP REPORT

30 July 2014

EIB Complaints Mechanism

Prepared by

Complaints Mechanism

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External Distribution
Complainant:
Borrower: Mozal
Regulator: MICOA

Internal Distribution
Management Committee
Secretary General,
Inspector General
EIB concerned services

The EIB Complaints Mechanism

The EIB Complaints Mechanism intends to provide the public with a tool enabling alternative and pre-emptive resolution of disputes in cases where the public feels that the EIB Group did something wrong, i.e. if they consider that the EIB committed an act of maladministration. When exercising the right to lodge a complaint against the EIB, any member of the public has access to a two-tier procedure, one internal – the Complaints Mechanism Division (EIB-CM) - and one external – the European Ombudsman (EO).

Complainants that are not satisfied with the EIB-CM's reply have the opportunity to submit a confirmatory complaint to EIB-CM within 15 days of the receipt of that reply. In addition, complainants who are not satisfied with the outcome of the procedure before the EIB-CM and who do not wish to make a confirmatory complaint have the right to lodge a complaint of maladministration against the EIB with the European Ombudsman.

The EO was "created" by the Maastricht Treaty of 1992 as an EU institution to which any EU citizen or entity may appeal to investigate any EU institution or body on the grounds of maladministration. Maladministration means poor or failed administration. This occurs when the EIB Group fails to act in accordance with the applicable legislation and/or established policies, standards and procedures, fails to respect the principles of good administration or violates human rights. Some examples, as set by the European Ombudsman, are: administrative irregularities, unfairness, discrimination, abuse of power, failure to reply, refusal to provide information, unnecessary delay. Maladministration may also relate to the environmental or social impacts of the EIB Group activities and to project cycle related policies and other applicable policies of the EIB.

The EIB Complaints Mechanism intends to not only address non-compliance by the EIB with its policies and procedures but to endeavour to solve the problem(s) raised by Complainants such as those regarding the implementation of projects.

For further and more detailed information regarding the EIB Complaints Mechanism please visit our website: http://www.eib.org/about/cr/governance/complaints/index.htm

Acknowledgements

The EIB-CM would like to thank all people and organisations with whom they have interacted during the investigation of this complaint, and expresses its appreciation to the EIB staff that have provided the required information.

Without the support and valuable contributions of everybody concerned, the preparation of this report would not have been possible.

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FOLLOW-UP REPORT

EXECUTIVE SUMMARY

The Mozal project, consisting of the construction of a smelting facility to produce aluminium for export, was the first major foreign investment project in Mozambique after the civil war that lasted more than 17 years. The project was considered to be a catalyst for foreign investment into Mozambique following the civil war. It is estimated that the project contributed approximately 3 percent of GDP and 5-10 percent of recent economic growth, with strong employment, tax, foreign exchange, and infrastructure contributions.

The present report is a follow-up to the recommendations of the EIB-CM's Conclusions Report on the Mozal Aluminium Smelter case, dated April 2012[1]. These recommendations included the realisation of a technical audit of the Environmental Management Systems (EMS) of Mozal, the main objectives being the review of (i) the General Environmental Management Policy of Mozal; (ii) issues related to the air emissions as well as the water and waste management; and (iii) Mozal's Stakeholder Engagement policies.

The audit, carried out between October 2013 and April 2014, concluded that, whilst there are areas for improvement, Mozal has an appropriate EMS in place. Mozal has the policies and resources to properly manage and mitigate environmental issues derived from its industrial activities. There is a focus of Mozal on strict procedural compliance. It will be equally important for Mozal to ensure that these processes are focused on managing actual positive environmental outcomes.

Concerning the events that triggered the complaint in 2010, while there was no evidence to suggest that significant impacts on ambient air quality had occurred, Mozal should prioritise the installation and operation of the continuous ambient air monitoring station at the MCDT site (currently under commissioning). It is also advisable to review the current emission monitoring systems at the Fumes Treatment Centre (FTC) in order to more accurately quantify emissions from the FTC and whether current practices are suitable to adequately manage the weekly FTC stack by-pass events.

Concerning the water and waste management, and whilst acknowledging that areas for improvement exist, Mozal has currently an appropriate water and waste management framework. However, in the medium term, and taking into account that the industrial zone where Mozal is located is expanding and other polluting industries are being established, it is important to engage with other relevant parties – the Mozambican authorities, the operators of the landfills and the suppliers of waste (of which Mozal is one) - to design a long term strategy to mitigate and manage water and waste disposals in line with Good International Industry Practices (GIIP).

In terms of stakeholder engagement, Mozal has succeeded in developing a strategy to work with local communities, mainly through the financing of social projects by the Mozal Community Development Trust. The Trust is financed with contributions of Mozal through its Corporate Social Responsibility programme. Mozal's senior management also engages half-yearly with local communities in public meetings to disseminate information of general nature, including environmental information. These actions of Mozal are commendable as they have a positive social impact on the ground and help to build trust amongst the company and the communities living around the plant. However, given the general public interest of environmental activities, there is scope, and we believe that it is in the interest of the parties involved, to discuss and agree on ways to disseminate environmental information allowing for a constructive consultation, particularly with NGOs specialised in a broader environmental agenda.

[1] http://www.eib.org/about/accountability/complaints/cases/mozal-2.htm

From the EIB perspective, Mozal has repaid the Bank's loans and the Mozambican Government is in the process of finalising the repayment of the EIB loans received and used as part of its capital to the shareholding. Therefore, the contractual relationship of the Bank with the Mozal project is coming to an end.

No new elements concerning the complaint have come through the follow-up phase; the EIB-CM will proceed to definitively close this case.

1. Background

1.1 On 26 October 2010, a coalition of Mozambican NGOs, lodged a complaint with the EIB Complaints Mechanism (EIB-CM) and other accountability mechanisms – Office of the Compliance Advisor Office (CAO) of IFC and MIGA and the OECD UK National Contact point - concerning the Mozal Aluminium Smelter located in Maputo, Mozambique. Mozal is a joint venture of BHP Billiton, the Industrial Development Corporation (South Africa), Mitsubishi Corporation and the Republic of Mozambique.

1.2 The allegations concerned the following matters:

- An alleged breach by Mozal of the EIB Statement of Environmental and Social Principles and Standards, being that Mozal operated under by-pass for 6 months during the rehabilitation of the smoke and gas treatment centres, resulting in unfiltered emissions, which could have an adverse impact on the environment and surrounding local people (including Maputo).
- An alleged lack of transparency from Mozal, being that communication with the complainants, including in relation to attempts by the complainants to obtain documents and data related to the by-pass, was unsatisfactory, slow, inconsistent and contradictory.

1.3 The EIB-CM carried out an independent review to assess the merits of the complaint, and it was concluded that the by-pass conducted by Mozal was justified under the circumstances. The report questioned why corrosion in the FTCs was not identified at an earlier stage and recommended a third party technical audit be conducted of Mozal's environmental management systems, after a period during which Mozal was given the opportunity to improve and further strengthen such systems.

2. The EIB Project : Mozal Aluminium Smelter, Mozambique

2.1 The Mozal project, consisting of the construction of a smelting facility to produce aluminium for export, was the first major foreign investment project in Mozambique after the civil war that lasted more than 17 years. The first phase of the project was completed six months ahead of schedule and under budget, and the first aluminium was produced in June 2000. In 2003, the Mozal plant was expanded to double its capacity to more than 500,000 tons per year, making it among the largest smelting facilities in the world, and the second largest in the Southern African region.

2.2 The project was supported financially by several International Financial Institutions, including the European Investment Bank ("The EIB" or "The Bank"). The EIB financed the project through direct loans to Mozal and loans to the Republic of Mozambique which enabled the Government to take a minority equity participation in the project in 1997.

2.3 The project was considered to be a catalyst for foreign investment into Mozambique following the civil war. The World Bank estimated that the project contributed approximately 3 percent of GDP and 5-10 percent of recent economic growth, with strong employment, tax, foreign exchange, and infrastructure contributions. Table 1 shows a summary of the main economic and social impacts of the project according to the Word Bank.

Table 1: Highlights of major contributions of Mozal project. Source: World Bank[2]

- The project tripled the country's exports and added more than 7 percent to GDP in its initial years of operation and an estimated 10 percent in 2001. Its impact on the trade balance has been a positive US$173 million per year.

- In its first five years of operation, the project generated more than US$300 million in foreign exchange earnings for Mozambique, and about US$70 million in fiscal receipts for the government.

- Roads, ports, power generation, telecommunications, water supply, and drainage systems were built or upgraded in order to build Mozal.

- Mozal created 15,000 jobs, mostly for Mozambicans, during both phases of its construction. The project currently provides jobs for 1,150 permanent staff, 1,600 contractors, and 10,000 indirectly through locally owned contractor firms.

- Through special trust funds - the Mozal Community Development Trust (MCDT) and the SME Empowerment Linkage Program (SMEELP), Mozal supports communities living around the smelter with activities in community infrastructure, education and training, health (AIDS prevention, malaria, etc.), environment, small business development, sports and culture.

- The largest foreign investment in Mozambique's history, the project demonstrated that large scale investments could be successful in the country's post-conflict environment. Foreign investors have since developed several other capital-intensive projects (Moma Mining Project, SASOL pipeline, and Maputo Port).

3. Scope of the audit and methodological approach

3.1 Following the recommendation of the Conclusions Report of April 2012, the EIB-CM, in consultation with the Bank's operational services, prepared the Terms of Reference (ToR) of the independent audit (Annex 1).

3.2 The main matters to be assessed included:

- A review of the General Environmental Management Policy of Mozal
- A review of the status of the implementation of the agreements summarised in the Conclusions Report, particularly (i) the air emissions of Mozal and the use of the by-pass; (ii) the water and waste management practices of Mozal
- A review of Mozal's Stakeholder Engagement policies.

3.3 On the basis of these ToR, SRK Consulting, a South African based consulting company, was selected to carry out the assignment. The audit started in October 2013 with a kick off meeting between the EIB-CM and SRK in Johannesburg; this meeting was followed by a site visit to Maputo to establish preliminary contacts with Mozal, and, by a meeting of the EIB-CM, with the representatives of the complainants.

3.4 In order to review some of the data and facts gathered during the first visit, a second mission to Mozambique took place in March 2014. The EIB-CM also met with the complainants and with the Mozambican Ministry of Environment (MICOA) to provide an update on the audit. SRK concluded its report in May 2014. Following the submission of the final copy of the SRK report in May 2014, the EIB-CM prepared the present Follow-up Report integrating the EIB-CM conclusions with the main findings and recommendations of the SRK report.

[2] http://web.worldbank.org/WBSITE/EXTERNAL/EXTABOUTUS/IDA/0,,contentMDK:21321646~menuPK:4752068~pagePK:51236175~piPK:437394~theSitePK:73154,00.html

4. Highlights of the Audit

4.1 For ease of reference, the entire SRK report (Annexe 2) is attached to the present Follow-up Report. The EIB-CM considers that, in light of the information gathered, the SRK report provides an accurate view of the issues assessed during the audit. The report also addresses the questions/issues raised by the Complainants during the implementation of the audit.

4.2 Mozal Environmental Management System

4.2.1 The audit carried out by SRK confirms that Mozal has established an efficient Environmental Management System (EMS). The EMS is well structured and documented and Mozal has assigned the necessary resources to implement it. The HSEC department is responsible for the governance requirements of environmental and social management. The capacity and resources of the HSEC team appears to have improved since 2010. In addition, Mozal undertakes numerous performance assessment processes to monitor performance. Notably, each department has a balanced scorecard including environmental and social indicators, as does Mozal at asset level. Several environmental and social management plans exist to guide management of important issues. A wide monitoring programme for monitoring impacts is conducted. There are certain areas for improvement of the EMS both at documentation and implementation levels, but it appears that they could be addressed through established procedures and continuous monitoring and training. In the medium term, Mozal EMS will make substantial gains in focusing its EMS strategy on outputs rather than on procedural compliance.

4.3 Review of Air emissions and water and waste management

4.3.1 The audit has found that air and water emissions of Mozal remain, to a large extent, within the limits established by Mozal's Emission Management Plans (EMP) agreed under the license, and with the IFC Performance standards.

4.3.2 The audit reviewed the monitoring reports related to the operation of the Fume Treatment Centre (FTC) at the Carbon Plant, which was the focus of the 2010 complaint. The Carbon Plant produces 'pre-baked' anodes for use in the smelter. Air emissions generated by this process are scrubbed in the FTC before discharge into the atmosphere. The FTC primarily removes fluoride from the resultant emissions. Following the 2010 incident, it was recognized that more frequent maintenance of the FTC was required. Hence, on a weekly basis, one of the two FTCs is taken off-line for between 4-6 hours for maintenance while the Carbon Plant is still operational. The resultant emissions are emitted directly into the atmosphere resulting in the so-called stack by-pass operating condition. During the course of the present audit, the complainants queried whether the use of the stack by-pass is normal practice at other aluminium plants e.g. BHP Billiton's Hillside smelter in Richards Bay, South Africa. Mozal indicates that the FTC at the Hillside smelter has a different configuration to the installation at Mozal. The Hillside FTC has a four filter unit which allows them to work on one unit while the other three are operational. At Mozal the FTC has a three filter unit and all three filters have to be shut down for maintenance while the Carbon Plant is operational, resulting in the need for the by-pass to be implemented weekly.

4.3.3 During normal operating conditions ambient concentrations for PM_{10}, $PM_{2.5}$, HF, SO_2, NO_2, BAP and dust deposition are generally below their respective ambient guideline limits listed in the Air Emissions Management Plan. However, exceedences of SO_2, PM_{10}, $PM_{2.5}$ and BAP standards listed in the Air Emissions Management Plan were observed during the ad-hoc third party ambient air quality monitoring campaigns during the February to May 2013[3] extended stack by-pass event. It should be noted that because ambient monitoring is currently conducted on an ad-hoc basis or during specific events, the frequency of exceedances on an annual basis cannot be determined. In this regard, the EIB-CM was informed that Mozal had installed recently - April 2014 (still under commissioning at the time of drafting this report) - the air

[3] These are samples taken post events of 2010 but reviewed by the existing audit

monitoring station that Mozal agreed to install during the previous consultations with complainants. With the new monitoring station, the planned continuous ambient monitoring for PM_{10}, $PM_{2.5}$ and SO_2 will allow Mozal to identify its contribution to the exceedances, both during non by-pass and by-pass events, and the potential number of exceedances on an annual basis.

4.3.4 Concerning water management, Mozal monitors the quality of its wastewater discharges and the water quality of the receiving watercourse. Mozal has also an established groundwater monitoring programme for the Mozal site. In both cases (wastewater discharges and groundwater) monitoring data confirms that Mozal is generally compliant to the discharge quality limits, and there is no significant quality impact downstream of the wastewater discharge, which is noted to be within the estuarine impact of the watercourse, and consequently is naturally saline and tidally influenced.

4.3.5 A set of water quality analyses that were provided to the EIB by the complainants, similarly reflects a saline environment commensurate with the location within the estuary/marine environment. Mozal's primary surface water quality monitoring and compliance parameter is Fluoride, and as there was no fluoride analysed in the data provided by the complainants, nor were the locations of the samples indicated, it is not possible to infer any notable issue from the data.

4.3.6 The audit also highlights that the practice of diluting the wastewater with river water to ensure compliance to the categorical limit is not considered to be best practice in the absence of scientific justification for the practice, even where authorised, rather than ensuring compliance by control of the wastewater load.

4.3.7 The operation of the sewage works is outsourced by Mozal, and it is understood that the ownership of the Mavoco and Matola landfills is held by the Mozambique authorities, which outsources the operation and monitoring of the sites. Audits by Mozal have apparently identified some issues with environmental performance, operation and management of the landfills and this has been communicated to the landfill operators. The ability of the Mozambique authorities to ensure no latent liabilities accrue to Mozal should be assured.

4.4 Stakeholder Engagement

4.4.1 In terms of stakeholder engagement, Mozal's Development Community Trust plays a key role in developing education and health projects. Some of the members of the NGO coalition that initially lodged the complaint in 2010 have engaged actively with Mozal to implement some of the projects managed by the Trust. In addition, Mozal carries out half-yearly public meetings with "Interested Parties". These public meetings enable Mozal to establish direct contact with the communities closer to the company's facilities and discuss issues of general interest in an open forum. However, and whilst it appears that Mozal has successfully engaged with local communities and some NGOs in the development of social programs and dissemination of general information, there is still room to improve engagement with NGOs that work at national level and have a more specialised environmental agenda, including some of the members of the original coalition of complainants. Engagement with this group of organisations requires a different forum of discussion and an agreement on key environmental information that should be disseminated.

4.4.2 Given the general public interest of environmental issues, it would be advisable to structure this further engagement both at company level and at industry level. While mechanisms already exist for information disclosure at company level, Mozal could consider further appropriate mechanisms to disclose and obtain feedback on various types of information, such as the environmental management plans (which are internal documents), results of performance assessments (including the MICOA annual audit), and data on key issues. At industry level, the EIB-CM was informed during the meeting with MICOA, that there is a proposed national forum for NGOs specialised in environmental issues. This forum might then be explored as a vehicle for dissemination and engagement on more performance-related and scientific information.

5. EIB-CM Conclusions

5.1 The EIB-CM acknowledges and appreciates the support of all the parties involved to carry out this technical audit. Mozal senior management and its HSEC team were present in all the meetings and have provided adequate information to carry out this assignment to the EIB-CM and its team of consultants. The complainants have continued being engaged with this assignment, providing guidance to the work of the consultants into areas of general interest to the public.

5.2 The audit carried out concluded that Mozal has put in place an appropriate EMS. It also has the policies and resources to properly manage and mitigate environmental issues derived from its industrial activities. There is currently a focus on strict procedural compliance. It will be important as well for Mozal to ensure that these processes are focused on managing actual environmental outcomes. Concerning the events that triggered the complaint in 2010, while there was no evidence to suggest that significant impacts on ambient air quality had occurred, Mozal should prioritise the delayed installation and operation of the continuous ambient air monitoring station at the MCDT site (currently under commissioning). It is also advisable to review the current emission monitoring systems at the FTC in order to more accurately quantify emissions from the FTC and whether current practices are suitable to adequately manage the weekly FTC stack by-pass events.

5.3 Whilst areas for improvement exist, Mozal has currently an appropriate water and waste management framework. However, in the medium term, and taken into account that the industrial zone where Mozal is located is expanding and other polluting industries are being established, it is important to engage with other relevant parties – the Mozambican authorities, the operators of the landfills and the suppliers of waste - to design a long term strategy to mitigate and manage water and waste disposals in line with Good International Industry Practices (GIIP).

5.4 Presently, Mozambique's development agenda is focused on harnessing the positive economic impacts of large-scale projects like Mozal to drive economic growth in other areas of the economy. Quite a few of the so-called "mega-projects" are related to mining and to the development of large infrastructure works, activities that potentially have significant impacts in the environment. In the interest of the country, the establishment of the environmental formal forum of discussion between the regulator (MICOA), the civil society and the investors seems essential.

5.5 Mozal, representing the first successful "mega project" operating in the country for almost 15 years, has accumulated significant and valuable experience in engaging with the local communities and managing environmental matters in a challenging economic environment. On the other side, the Complainants, have demonstrated the important role that an organised civil society plays in keeping investors accountable in terms of environmental public interest matters. Both entities (Mozal and Complainants) are therefore in a privileged situation to engage actively in the environmental forum that MICOA is facilitating.

5.6 From the EIB perspective, Mozal has repaid all the Bank's loans and the Mozambican Government is in the process of finalising the repayment of the EIB loans received and used as part of its capital to the shareholding. Therefore, the contractual relationship of the Bank with the Mozal project is coming to an end.

5.7 No new elements concerning the complaint have come through the follow-up phase; the EIB-CM will proceed to definitively close this case.

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Acronyms

BAP	Best Available Practice
EIB	European Investment Bank
EIB-CM	Complaints Mechanism of the European Investment Bank
EO	European Ombudsman
FTC	Fumes Treatment Centre
GIIP	Good International Industry Practice
HSEC	Health, Security and Environment Committee
MCDT	Mozal Community Development Trust
MICOA	Mozambican Ministry of Environment
NGO	Non-Governmental Organisation
ToR	Terms of Reference

ANNEX 1 – TERMS OF REFERENCE

Consultancy Services to the EIB Complaints Mechanism

TERMS OF REFERENCE

1. *Background on the EIB*

The European Investment Bank (EIB) is the financing institution of the European Union. Created by the Treaty of Rome, its shareholders are the Member States of the European Union, and its Board of Governors is composed of the Finance Ministers of these States. The EIB enjoys its own legal personality and financial autonomy within the Community system.

The mission of the EIB is to contribute, by financing sound investment, to the policy objectives of the European Union, as laid down in its statutes and in decisions of the European Council. The EIB contributes towards the integration, balanced development and economic and social cohesion of the Member States of the European Union. To this end, it raises on the markets substantial volumes of funds that it directs on the most favourable terms towards financing capital projects according with the objectives of the Union. Outside the EU the EIB implements the financial components of agreements concluded under European development aid and cooperation policies.

More background information about the EIB may be found on the website www.eib.org

2. *Background of the subject matter*

2.1. *The EIB Complaints Mechanism*

The EIB Complaints Mechanism is a vital tool of horizontal accountability of the EIB Group vis-à-vis its stakeholders as regards the handling of complaints concerning its activities. It provides the public with a tool enabling alternative and pre-emptive resolution of disputes between the latter and the EIB. Meanwhile, the Complaints Mechanism assists the EIB, for the common sake of good administration, by contributing to the identification of possible improvements to the implementation of the EIB Group's activities.

To ensure that stakeholders (including the people affected by an EIB financed project) have access to appropriate means with a view to voicing their concerns under the EIB Complaints Mechanism, Principles, Terms of Reference and Rules of Procedures (CMPTR)[4], the EIB established a Complaints Office that handles complaints lodged directly with the EIB Group, whilst dealing with complaints lodged against the EIB Group with the European Ombudsman or with any other complaint lodged with international institutions or bodies and which (directly or indirectly) concerns the EIB Group.

The EIB CMPTR applies to complaints regarding maladministration. Maladministration means poor or failed administration. This occurs when the EIB Group fails to act in accordance with the applicable legislation and/or established policies, standards and procedures, fails to respect the principles of good administration or violates human rights. Some examples of failure to respect the principles of good administration, as set by the European Ombudsman, are: administrative irregularities, unfairness, discrimination, abuse of power, failure to reply, refusal of information, unnecessary delay. Maladministration may also relate to the environmental or social impacts of the EIB Group activities and to project cycle related policies and other applicable policies of the EIB.

[4] http://www.eib.org/infocentre/publications/all/complaints-mechanism-policy.htm

The EIB Complaints Mechanism is independent from operational activities and thus ensures that each complaint is dealt with by the highest standards of objectiveness whilst safeguarding the interest of all the internal and external stakeholders of the EIB Group.

The Head of the Complaints Mechanism Division is responsible for the development, implementation and monitoring of the EIB Complaints Mechanism.
In the context of investigation of admissible complaints, the EIB Complaints Mechanism serves the following functions:

- Assess occurrence(s) of maladministration;
- Evaluate and report for each admissible complaint the compliance with the EIB Group's policy framework;
- Attempt to, whilst acting as a problem solving or pre-emptive dispute resolution function, resolve concerns raised by the complainant through a consensual process;
- Provide advice and recommendations to the EIB Management; and
- Follow-up and report on efforts to take corrective actions whenever applicable.

In order to ensure proper corporate responsibility and accountability of EIB Group towards all its stakeholders, the EIB Complaints Mechanism is predominantly *compliance focussed*. Over and above such compliance review and whenever applicable the EIB Complaints Office has a *remit for problem solving and/or mediation*.

2.2. The Complaint regarding the Mozal Project

The complaint

On 26 October 2010, a coalition of Mozambican NGOs (Justiça Ambiental, Livaningo, Liga Moçambicana dos Direitos Humanos, Centro Terra Viva, Kulima and Centro de Integridade Pública) lodged a complaint with a number of independent accountability mechanisms of financial Institutions including the EIB Complaints Mechanism (EIB-CM), the Office of the Compliance Advisor Ombudsman (CAO) for IFC & MIGA and the OECD UK National Contact Point.

The allegations brought by the complainants mainly concerned:

- The alleged breach by Mozal of the EIB Statement of Environmental and Social Principles and Standards - Mozal's decision to operate under bypass for 6 months during the rehabilitation of the smoke and gas treatment centres would mean that there would be air emissions without passing through filters, which could have an adverse effect on the environment and the health of the people living in the area (including Maputo).
- The alleged lack of transparency from Mozal despite various attempts to obtain documents and data related to the bypass; communication by Mozal with civil society, and in particular with the complainants, has been strikingly unsatisfactory, slow, inconsistent and contradictory.

The project and the bypass

Mozal is a joint venture of the BHP Billiton group, the Industrial Development Corporation of South Africa (IDC), Mitsubishi Corporation and the Republic of Mozambique. The EIB financed the project (MOZAL ALUMINIUM SMELTER), through a direct loan to Mozal and a loan to the Republic of Mozambique for a minority equity participation (from risk capital resources) in 1997. The project is a classical electrolysis (reduction with direct current of molten alumina mixed with salts), an exact replication of the Hillside smelter with one potline (all electrolysis cells in line) of two potrooms. Total capacity will be 245 kt of aluminium ingots per year. A second EIB loan (MOZAL II) to the Republic of Mozambique was approved in 2001, with amongst others IFC, DEG and Proparco as co-financiers, for a minority equity participation in the project extension concerning the construction and operation of an extension of capacity in the existing Mozal aluminium smelter.

In 2010, due to severe structural damage as a result of unanticipated corrosion, Mozal had been forced to rebuild the Fume Treatment Centres (FTCs) that treat fumes from the anode bake furnaces. In order to redress the situation during the rebuilding of the FTCs, it had been necessary to go into bypass mode. Such bypasses resulted in emissions from the bake furnaces having been released directly into the atmosphere via the existing stacks. Moreover, atmospheric emissions from the entire smelter could have resulted in potential increases in ambient concentrations of certain key pollutants compared to normal operations; specifically hydrogen fluoride, particulate matter and tars. On

26.05.2010 the Ministry of Environment (MICOA) had issued the Special Authorisation which allowed Mozal to go ahead with their planned bypass. According to Mozal, an assessment had been conducted prior to the bypass in order to anticipate changes in emissions together with predicted ambient concentrations of the three pollutants in question, and it had been concluded that at the time of the assessment, the bypass would not have resulted in significant health risks for people that could be affected by the increased emissions.

The EIB had been informed about the bypass only after this operation/change, i.e. 2 weeks after the actual start of the bypass. In order to ensure a common and consistent position, it has been decided between the 3 EU based co-financiers (DEG, PROPARCO and EIB) to collaborate closely with the EIB-CM in its assessment and investigation of the complaint.

EIB-CM work

The EIB-CM performed its Initial Assessment, including an on-site assessment from 13 to 17 December 2010 in co-operation with the CAO to better understand the complainants' allegations, the position of the project promoter and the environmental authorities, and the situation on the ground. A second objective was to determine if further work would be necessary and/or possible from EIB-CM side. Based on the outcome of this Initial Assessment it was agreed that the CAO would pursue its mediation process, while the EIB-CM would conduct a compliance review. From February to May 2011, the EIB-CM conducted a further assessment of a compliance review nature, which included a site visit in February 2011. During this visit, the EIB-CM participated in the first mediation meeting between the parties organised by IFTC CAO.

The EIB-CM performed its Initial Assessment and its Compliance Review in full cooperation with the EIB's operational services as well as with the other European Co-financiers (DEG and Proparco).

Findings and Conclusions

The bypass

FTC1 went back into normal operation on 17.03.2011. FTC2 went back into normal operation on 29.03.2011. This means that the bypass period for both FTC's was within the intended time frame (133 out of 137 planned days).

The EIB-CM concludes that the rationale for the decision to operate with a bypass of both FTCs seemed justified, on the basis of the then current FTCs' conditions and the consequent urgency of the repair. Evidence supports the view that the corrosion levels were extremely high with holes letting the gases and dust escape, and presenting a real risk for the FTCs to collapse, thus presenting a risk for the safety of the workforce employed in the facility and for the overall production facilities. However, the fact that the extensive corrosion of several components of the FTCs only started to be detected by the end of 2008, due to problems with the production process and output, raises questions about the operational monitoring and maintenance of such equipment. This has been investigated by Mozal, and the financiers are still to be informed of the findings of such investigation.

The final choice (i.e. operation in full by-pass) was made under the assumption that air concentrations of pollutants would globally remain below established limits and would present no risk for human health. Such assumption stems from a dispersion model elaborated within the framework of an assessment carried out by SE Solutions, a long time established partner of Mozal. Although (i) the baseline data for the study could be disputed, (ii) Mozal's emissions management presented some weaknesses and (iii) some hgh peak concentration exceeding applicable limits have been detected, the monitoring data available for the bypass period reasonably sustained such an assumption. It is understood that the huge public exposure of the monitoring process, by an independent company, with high scrutiny by NGOs and even direct scrutiny by key members of government, has put additional pressure on Mozal to closely manage its production process so as to ensure that emissions from the anodes production lines are kept to acceptable levels.

Although the bypass can be considered justified and has not generated major negative impacts, there was room for improvement regarding (i) transparency and stakeholder engagement; (ii) management and monitoring of emissions to the environment; (iii) operational monitoring and maintenance of key mitigation equipment.

The EIB Statement of Environmental and Social Principles and Standards

Regarding the alleged breach of non-compliance with the EIB Statement of Environmental and Social Principles and Standards, the EIB-CM takes note that the initial transparency on the process and related stakeholders' engagement revealed deficiencies. Also the monitoring and management of emissions revealed to be sub-optimal. Indeed, perceived lack of access to information on the environmental impacts and on management in relation with the bypass process, as well as a general perceived lack of transparency and initial unwillingness to engage with local NGOs from Mozal side, seem to have led to the initial manifested deterioration of the relationship between Mozal and the Coalition and to the confrontation thereafter. Regarding the stakeholders engagement between Mozal and the Coalition, it must be noted that the involvement of the IFC-CAO and the EIB-CM has contributed to clarify the dialogue and to better engagement in a meaningful way, more in line with the public expectations. In the EIB-CM opinion, it appears that the major deficiency in terms of control and monitoring has been the absence of continuous monitoring of HFs, dust and TARs at the emission points (GTCs and FTCs stacks and Roofvents). Only such continuous monitoring equipment can give adequate assurance that limits in relation to emissions to the air are respected and can ensure that control of such emissions is effectively managed.

Although further assurance is still requested (see recommendation below), the project now seems to be compliant with the EIB Statement of Environmental and Social Principles and Standards.

EIB compliance

The EIB-CM further concluded that it was difficult for the EIB operational services to have known about the bypass and its actual starting date, before they had received the communication dated 16.11.2010 and before having been informed about the complaint. The quick reaction from the Bank as soon as the complaint was received should be noted. Furthermore, the control of emissions and the monitoring of air quality by Mozal, as agreed with MICOA, were reinforced by the intervention of the EIB-CM, the IFC-CAO and the IFC services. The bypass, being the technical solution to deal with the problem, had been decided by the project Promoter on the basis of the then current FTCs conditions and the consequent urgency of the repair, with no room for manoeuvre. Therefore, the EIB-CM concludes that there has not been an instance of maladministration on the part of the EIB.

Recommendations

Notwithstanding the above, and in view of the events surrounding the need for the bypass and the belated information received thereof by the EU co-financiers, as well as to attain confidence that such a situation does not happen again and that emissions will be adequately monitored and controlled, the EIB-CM recommends that an independent technical review and assessment will be undertaken into the existing environmental management and monitoring systems, and reporting mechanisms in place at Mozal.

As a result of the outcome of the CAO mediation process, whereby a final agreement could not be reached between the parties, the EIB-CM asks the EIB services to ensure that Mozal reports regularly on future bypasses of mitigation equipments, above a reasonable threshold, and including communication to the public and description of possible impacts well in advance and the establishment and further development of a broad forum/mechanism of dialogue with the civil society in the context of management of environmental impacts.

3. Description of the works and services

The objective of these terms of reference is to request a proposal for assistance to perform an independent technical review and assessment of the existing environmental management and monitoring systems, and reporting mechanisms in place at an aluminum smelter financed project co-finance by the EIB in Maputo, Mozambique

The Head of Complaints Mechanism Division will supervise the Service Provider's work and a complaints officer will be in charge of the consultants.

The review should cover:

Overall environmental management systems

- Organization, staff resources
- Procedures
- Norms and standards
- Prevention, control and mitigation
- Sampling and analysis methods
- Monitoring and reporting
- Impacts on Community health and safety
- Emergency responses

Air emissions and ambient air quality

- Air pollutants: PM, PAH, HF, VC, metals, dry gas
- Emissions monitoring: FTCs, GTCs and fugitive emissions (roof vents)
- Air quality monitoring (locations, frequency, sampling and analysis methods)

Wastewater and ambient water quality

- Process wastewater, wastewater from operations, runoff from process and material staging areas, storm water and other;
- pH, temperature, suspended solids, heavy metals, cyanide, oily and volatile materials;
- Monitoring of ambient water quality (locations, frequency, sampling and analysis methods)

Waste management

- On-site and off-site waste storage, treatment and disposal
- Hazardous waste management

4. Deliverables

- An initial outline of the detailed works to be performed;
- A draft report for discussion after the site visit;
- A final report.

5. Time frame

The mission will start on [to be discussed] with a kick-off meeting at [to be discussed]. The visit to Mozal in Maputo is expected to take place in [to be discussed].

The first draft report should be delivered before [to be discussed] and the final report is to be completed by [to be discussed] at the latest.

ANNEX 2 – SRK REPORT

Mozal Environmental Management Systems Audit

FINAL

Report Prepared for

European Investment Bank – Complaints Mechanism

Report Number 460796/D01

Report Prepared by

srk consulting

May 2014

Mozal Environmental Management Systems Audit

FINAL

European Investment Bank – Complaints Mechanism

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SRK Project Number 460796

May 2014

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Executive Summary

Background and scope of work

This report presents the findings of an environmental management systems audit for the Mozal Aluminium Smelter located 17 km from Maputo in Mozambique. The smelter is operated by Mozal, which is a joint venture of BHP Billiton, the Industrial Development Corporation (South Africa), Mitsubishi Corporation and the Republic of Mozambique. Mozal was built in 1997 and commissioned in 2000 and is the second largest aluminium smelter in southern Africa.

A coalition of non-governmental organisations laid a grievance with several independent accountability mechanisms relating to the extended 'by-pass' of the Fume Treatment Centres (FTC) in 2010. Mediation and investigation of the grievance were conducted by the International Finance Corporation Compliance Advisor Ombudsman and the European Investment Bank (EIB) Complaints Mechanism, as well as an investigation by the Organization for Economic Co-operation and Development's (OECD) UK National Focal Point. Two reports were issues by the EIB and OECD which concluded that the bypass conducted by Mozal was justified under the circumstances. The reports question why corrosion in the FTCs was not identified at an earlier stage and recommend a third party technical audit be conducted of Mozal's environmental management systems.

SRK Consulting South Africa (Pty) Ltd was therefore commissioned by the EIB to undertake a limited third party audit of Mozal's environmental management systems, and in particular to focus on air quality, water and waste management. The audit comprised a review of documentation and a site visit conducted between 28 and 30 October 2013. Interviews and discussions with numerous Mozal staff members were held and their positive cooperation and engagement with the SRK team is noted. The audit was undertaken by Donald Gibson, Vis Reddy and Andrew Wood.

Audit framework

The audit framework comprised the following international standards:

- ISO14001:2004 Environmental Management Systems
- IFC Performance Standards on Environmental and Social Sustainability (2012) including:
    - Performance Standard 1 on Environmental and Social Assessment and Management
    - Performance Standard 3 on Resource Efficiency and Pollution Prevention
    - Performance Standard 4 on Community Health, Safety and Security
- World Bank Group Environmental, Health and Safety Guidelines.

Mozal uses the 1998 World Bank standards as the general basis for their approved environmental management plan, and the Annual Monitoring Reports use these standards. SRK, as a comparison have selected the above-mentioned standards as part of this assessment.

Limitations

While the main report lists all the applicable limitations, the following key limitation applies to this audit and the findings should be read with these in mind:

- The opinions expressed in this report have been based in part on the information supplied to SRK by Mozal and the European Investment Bank. The accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. Opinions presented in this report apply to the site conditions and features as they existed at the time of SRK's investigations, and those reasonably foreseeable. Given the limitations and the scope of the engagement, and unless otherwise stated or qualified in the text, nothing came to

SRK's attention that leads it to believe that the findings and observations presented are not correct.

Findings and observations

Overall Environmental Management System

While there are opportunities for improvement, Mozal's environmental management system (EMS), which is ISO14001-certified, is well structured and documented, and there is an emphasis on procedural rigour. Mozal has sufficient resources (human and financial) in place to maintain and implement the 'Health, Safety, Environment and Community' function (HSEC), and associated systems, and there is a policy framework from BHP Billiton group level and at Mozal asset level that guides implementation. Senior support for and commitment to environmental and social management exists.

Objectives, targets and indicators in the form of performance requirements are specified in a range of documentation, and Mozal undertakes numerous performance assessment processes to monitor performance. Notably, each department has a balanced scorecard including environmental and social indicators, as does Mozal at asset level. Several environmental and social management plans exist to guide management of important issues.

A wide monitoring programme for monitoring impacts is conducted. Comments on the monitoring and management aspects are included under air quality, water and waste management sections.

Regular assessments of the EMS performance are conducted by HSEC with involvement from the Asset President, BHP Billiton Group HSEC representatives, and operational managers.

Stakeholder engagement

Stakeholder engagement has been reviewed at a high-level, and its importance within Mozal has been elevated since 2010. The Head of External Affairs, Samuel Gubo, now 'owns' the function, and works in collaboration with the HSEC department, and in particular the Mozal Community Development Trust, which is responsible for community development projects. A Stakeholder Engagement Plan was compiled in 2012 and recently updated to guide engagement with a range of stakeholders. The Stakeholder Engagement Plan broadly covers the correct content as required by Good International Industry Practice. It describes a range of engagement mechanisms used by Mozal, one of which is the 6-monthly 'Interested Parties' meeting, which provides a range of stakeholders with an opportunity to receive feedback on performance, and to voice issues to Mozal.

In terms of the status of relationships, SRK's opinion is that Mozal proactively engages with communities and the Mozambican government, and in this connection notes the positive influence exerted by the community development involvement of the Mozal Community Development Trust. Acknowledging that Mozal has invited participation of non-governmental organizations, the relationship with certain members of the Coalition of Non-Government Organizations (NGOs) that laid the grievance in 2010 would benefit from additional relationship-building efforts by both parties. We note that the complainants have expressed a wish to receive written information on performance more regularly than relying only on the 'Interested Parties' meetings at which verbal disclosure is given.

While mechanisms exist for information disclosure, we would recommend that Mozal should consider further appropriate mechanisms to disclose and obtain feedback on various types of information, such as the management plans (which are internal documents), results of performance assessments (including the MICOA annual audit), and data on key issues. The Mozambican government has indicated that there is a proposed national forum for NGOs focussing environmental

issues, and this might be explored as a vehicle for dissemination and engagement on more performance-related and scientific information.

Engagement tailored to the interests of stakeholder groups should continue to be based on stakeholder mapping and analysis, and those engagement mechanisms for the disclosure of performance data and outcomes should be prioritised by Mozal. We would encourage Mozal to continue a strategic and proactive approach to engaging with stakeholders, incorporating the elements of good practice such as early consultation and transparency.

Air quality

- The operation of the Fume Treatment Centre (FTC) at the Carbon Plant was the focus of the 2010 complaint. The Carbon Plant produces 'pre-baked' anodes for use in the smelter. Air emissions generated by this process are scrubbed in the FTC before discharge into the atmosphere. The FTC primarily removes fluoride from the resultant emissions. Following the 2010 incident, it was recognized that more frequent maintenance of the FTC was required. Hence, on a weekly basis, one of the two FTCs is taken off-line for between 4-6 hours for maintenance while the Carbon Plant is still operational. The resultant emissions are emitted directly into the atmosphere resulting in the so-called stack by-pass operating condition. Stakeholders have queried whether this is normal practice at other aluminium plants e.g. BHP Billiton's Hillside smelter in Richards Bay, South Africa. Mozal indicates that the FTC at the Hillside smelter has a different configuration to the installation at Mozal. The Hillside FTC has a four filter unit which allows them to work on one unit while the other three are operational. At Mozal the FTC has a three filter unit and all three filters have to be shut down for maintenance while the Carbon Plant is operational, resulting in the need for the by-pass to be implemented weekly.
- There was no evidence to suggest that significant impacts on ambient air quality had occurred as a result of short periods of exceedances of ambient air quality guidelines for PM_{10} and $PM_{2.5}$, SO_2 and HF during stack by-pass events when monitoring was conducted.
- During normal operating conditions ambient concentrations for $PM_{10,}$ $PM_{2.5}$, HF, SO_2, NO_2, BAP and dust deposition are generally below their respective ambient guideline limits listed in the Air Emissions Management Plan. However, some exceedances of SO_2, PM_{10}, $PM_{2.5}$ and BAP standards listed in the Air Emissions Management Plan were observed during the *ad-hoc* third party ambient air quality monitoring campaigns during the February to May 2013 extended stack by-pass event. For PM_{10}, $PM_{2.5}$ and SO_2 exceedances of the respective Mozal standards were observed on more than one occasion. While the number of exceedances recorded exceeded the permissible number of allowable annual exceedances this was abnormal due to the extended by-pass event. Furthermore, it is possible that the frequency of these exceedances could exceed the permissible allowable number of exceedances per year with the weekly FTC by-pass events becoming a part of normal operations. It should be noted that because ambient monitoring is currently conducted on an *ad-hoc* basis or during specific events, the frequency of exceedances on an annual basis cannot be determined. The planned continuous ambient monitoring for PM_{10}, $PM_{2.5}$ and SO_2 will allow Mozal to identify its contribution to the exceedances, both during non-by-pass and by-pass events, and the potential number of exceedances on an annual basis.
- The increasing trend in total fluoride emissions is a concern and Mozal has implemented several initiatives towards reversing this trend. These include the efforts made to reduce anode effects by removing the fines from the incoming alumina streams, improving anode covering, as well as a progressive replacement of the pot hoods to ensure that fugitive emissions into the potrooms are effectively controlled. Mozal has also indicated that instability in its power supply has also been a factor contributing to the increased total fluoride.

- Ambient SO_2 and PM concentrations exceeded the ambient 24-hour World Bank Group and World Health Organization guideline, respectively (as adopted in Mozal's Air Emissions Management Plan) during the extended stack by-pass event from 28 February to 1 May 2013 on a number of occasions.
- Mozal has the people, systems, protocols and budgets in place to comply with its commitments towards minimising, if not eliminating, negative impacts. However the lack of continuity in the various steps that are undertaken from sample collection to data interpretation may result a loss in data quality and effective use of the data and trends to identify possible problems. Further, staff involved in sample collection and data processing should interrogate the procedures/protocols being followed, and interpret the data to ensure that good quality and reliable data are produced to support management decisions.

Water and waste management

- Mozal's water and waste management performance is generally compliant with the EMP and License conditions, and the general requirements of the IFC Performance Standards. There is limited requirement to review the original EMP and License conditions to assess the practical impacts of Mozal discharges and waste management practices. There is also limited requirement to revise these where appropriate, rather than monitoring against the categorical limits established for the operation prior to its construction and on-going operation, without comprehensive interpretation of the monitoring data and practical quantification of impacts or risks.
- The practice of diluting the wastewater with river water to ensure compliance to the categorical limit is not considered to be best practice in the absence of scientific justification for the practice, even where authorised, rather than ensuring compliance by control of the wastewater load. Mozal has an established groundwater monitoring programme for the Mozal site and compares its on-going groundwater monitoring data to groundwater quality limits taken to be the groundwater compliance limits prescribed by the original EMP. These groundwater quality limits are not drinking water quality limits, but are limits reflecting a saline groundwater regime, commensurate with the site being located within the zone of influence of the marine/estuary environment. Regular groundwater analysis has been undertaken since 2002. The data indicate a general compliance to the limit values, and there is no statistical trend of deterioration. Mozal does not appear to be required to undertake action, other than on-going monitoring.
- Mozal monitors the quality of its wastewater discharges and the water quality of the receiving watercourse. Monitoring data confirms Mozal is generally compliant to the discharge quality limits, and there is no significant quality impact downstream of the wastewater discharge, which is noted to be within the estuarine impact of the watercourse, and consequently is naturally saline and tidally influenced.
- A set of water quality analyses that were provided to the EIB by the complainants, similarly reflects a saline environment commensurate with the location within the estuary/marine environment. Mozal's primary surface water quality monitoring and compliance parameter is Fluoride, and as there was no fluoride analysed in the data provided by the complainants, nor were the locations of the samples indicated, it is not possible to infer any notable issue from the data.
- The Matola and Mavoco landfills are understood by SRK to be owned and administered by the local Municipality and FUNAB respectively. Mozal commissioned an investigation into the integrity of the groundwater associated with an area adjacent to the Matola landfill that received some stabilised Mozal waste originally, prior to the construction of the Mavoco landfill. The

consultant's report indicates no significant change in groundwater quality upstream and downstream of the landfill.

- Mozal is considered to have adequate knowledge and resources within the HSEC team, and associated business units, to effectively implement the water and waste management requirements of the EMP and License. Documented Water Management and Waste Management Plans have been drafted, and approved by senior management. These guide and monitor compliance, and are intended to promote preventive measures consistent with GIIP, such as the WBG EHS Guidelines. These intend identifying risks and impacts and providing mitigation measures which favour the avoidance of risks and impacts over minimization. Mozal schedules audits of performance of the internal business units and external waste management service providers. The plans are generally appropriate, and comprehensive, but do appear to lack the practical interpretation of the impact of the water quality monitoring being undertaken rather than comparing results to limits that were established at the time of the construction, and assessing biological impacts as opposed to comparison only to numerical quality. While Mozal environmental personnel may make recommendations from their internal audits, these may be more timeously implemented, recognizing that none of the recommendations that SRK was made aware of were material to the on-going operation of the environmental protection measures, but tended instead to be housekeeping aspects and reporting. Where Mozal audits external waste service providers, and may make recommendations in respect of environmental performance, Mozal has little power to enforce implementation of recommendations, since the waste service providers are controlled by licenses issued by regulatory authorities, and not by Mozal.
- Mozal's wastewater and waste management infrastructure and services appear to have been designed and constructed in accordance with the principles of GIIP. Safety risks to third parties are considered, as identified at the time of the Mozal project development, and in the case of hazardous waste, general waste and sewage management to standards above that applied elsewhere in Mozambique. The operation of the sewage works is outsourced by Mozal, and it is understood that the ownership of the Mavoco and Matola landfills is held by the Mozambique authorities, which outsources the operation and monitoring of the sites. Audits by Mozal have apparently identified some issues with environmental performance, operation and management of the landfills and this has been communicated to the landfill operators. The ability of the Mozambique authorities to ensure no latent liabilities accrue to Mozal should be assured. SRK has recommended that unless Mozal is assured that no liabilities will arise, that Mozal investigate alternatives, including the construction of on-site facilities under Mozal full control.
- The Environmental Social and Impact Assessment was authorised and the licenses issued, and Mozal indicate that subsequent performance monitoring has not elicited complaints from the authorities or communities. Mozal had not been advised of the water quality concern that has been communicated to the European Investment Bank and has not been requested to respond to it.
- Mozal's existing water and waste management infrastructure provides a sound basis for the responsible management of wastewater discharge and waste disposal against license conditions.

Recommendations

For Mozal

While Mozal's EMS was observed to be well structured and resourced, as with any management system, areas for improvement were identified. Therefore both cross-cutting and issue-specific

recommendations have been made. Readers of this report should note, however, that the recommendations are intended for Mozal's consideration and should not necessarily be used as a basis for performance monitoring. Recommended cross-cutting areas of focus include the following items:

- More focus on environmental outcomes instead of procedural compliance
- Commitment to applying prevailing good practice represented by applicable international standards such as those used in this audit
- Independent assurance and verification of in-house generated data through the enhanced integration of monitoring processes
- Engagement tailored data having reasonable regard to the requirements of stakeholders and written disclosure of information and performance data.

While more detailed recommendations relevant to the audit framework are included in the document and are too numerous to include here, the following specific recommendations are applicable:

- The delayed installation and operation of the continuous ambient air monitoring station at the MCDT site should be prioritized. Mozal has indicated that this monitoring station will be operational during April 2014.
- A review of the current emission monitoring systems at the FTC should be undertaken to more accurately quantify emissions from the FTC and whether current practices are suitable to adequately manage the weekly FTC stack by-pass events.
- Continue to review, and update, the water and waste management practices in accordance with findings of internal audits and interpretation of the trends in waste generation, water use, wastewater quality and receiving water and ecological quality, and opportunities for improvement informed by regular review of local and international practices.
- Continue to review the operational practices and performance of wastewater and solid waste service providers, and the contractual conditions between Mozal and service providers
- Continue to review the groundwater and surface water impacts, and soil contamination, in respect of the practical risks that such impact may pose currently, or in future, to ensure that mitigation measures can be developed*.*

For European Investment Bank

SRK believes that the investigation of this complaint has been comprehensively undertaken by the European Investment Bank Complaints Mechanism. Consequently, SRK does not consider that additional studies are required to close-out the complaint; particularly as the European Investment Bank's direct financial interest in Mozal has been repaid.

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Acronyms and abbreviations

ALD	Asset Level Document
BOP	Best Operating Practice
BSC	Balanced Score Card
EHS	Environment, Health and Safety
EIA	Environmental impact assessment
EIB	European Investment Bank
EIB-CM	European Investment Bank Complaints Mechanism
EMS	Environmental Management System
ESIA	Environmental and Social Impact Assessment
FTC	Fume treatment centre
GIIP	Good International Industry Practice
GLD	Group Level Document
HF	Hydrogen fluoride
HSEC	Health, Safety, Environment and Community
IFC	International Finance Corporation
ISO	International Standards Organisation
MCDT	Mozal Community Development Trust
NGO	Non-government Organisation
NO_2	Nitrogen dioxide
PM	Particulate Matter
SEP	Stakeholder Engagement Plan
SO_2	Sulfur dioxide
WBG	World Bank Group

1 Introduction

1.1 Background and purpose

This report presents the findings of an audit of the Mozal Aluminium Smelter's environmental management systems (EMS). Situated close to Maputo in southern Mozambique, the smelter is operated by Mozal, which is a joint venture of BHP Billiton, the Industrial Development Corporation (South Africa), Mitsubishi Corporation and the Republic of Mozambique. Mozal was built in 1997 and commissioned in 2000 and is the second largest aluminium smelter in Southern Africa.

A coalition of non-governmental organisations (NGOs) laid a grievance with several independent accountability mechanisms relating to the extended 'by-pass' of the Fume Treatment Centres (FTCs) in 2010. While mediation and investigation of the grievance were conducted by the International Finance Corporation (IFC) CAO and the European Investment Bank (EIB) Complaints Mechanism, a recommendation for a third party technical audit was made.

SRK Consulting (South Africa) (Pty) Ltd (SRK) was therefore commissioned by the EIB to undertake a limited third party audit of Mozal's EMS, and in particular to focus on air quality in relation to the grievance, as well as the broader issues of water and waste. This report details the findings of the audit and provides recommendations on improving Mozal's EMS, and discusses whether further investigations should be conducted by the EIB.

1.2 Disclaimer and reliability

The opinions expressed in this report have been based in part on the information supplied to SRK Consulting (South Africa)(Pty) Ltd (SRK) by Mozal and the EIB. SRK has exercised all due care in reviewing the supplied information. Whilst SRK has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. SRK has no reason to believe that any material facts have been withheld by Mozal or the EIB. SRK does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from them. Opinions presented in this report apply to the site conditions and features as they existed at the time of SRK's investigations, and those reasonably foreseeable.

1.3 Independence

SRK Group Consulting Practices employ approximately 1600 staff operating from more than 43 established offices on 6 continents. The Group's independence is ensured by the fact that it is strictly a consultancy organisation, not holding equity in any project and with ownership primarily by staff. This permits its consultants to provide clients with conflict-free and objective support on crucial issues.

SRK has a demonstrated track record of undertaking independent assessments of resources and reserves, project evaluations and audits, listing reports and independent feasibility studies to bankable standards on behalf of companies and financial institutions worldwide. It therefore does not face any conflicts of interest with regards to any aspect of the assignment. The SRK Group has also worked on a large number of major international developments, and in particular provides third party input to audits, due diligences, and reviews using host country legal requirements and international standards such as the Equator Principles and International Finance Corporation's Performance

Standards on Environmental and Social Sustainability, and those of the International Standards Organisation, as the auditing framework.

1.4 Competency and qualifications of auditors

This audit was undertaken by Donald Gibson, Vis Reddy and Andrew Wood, all of whom are Partners and Principal Consultants at SRK in South Africa. All consultants are specialists in the management of environmental and social aspects of large-scale development projects in Africa and internationally. Neither SRK nor the auditors who conducted this audit and authored this report have had within the previous two years, any shareholding, or any other pecuniary, economic or beneficial interest in Mozal or the European Investment Bank. Consequently, SRK and the auditors consider themselves to be independent of Mozal and the European Investment Bank.

Donald Gibson holds a Master of Science degree from the University of the Witwatersrand. He is a Professionally Registered Environmental Scientist with the South African Council of Natural Scientific Professionals (Reg. No. 400098/06), and is a Member of the Institute of Directors Southern Africa. Donald has completed the Certified Sustainability Assurance Practitioner qualification through AccountAbility in the United Kingdom. He has been involved in sustainability management for the past 15 years in both the private and public sectors, a large component of which has been in conducting due diligence audits in the resources and infrastructure sectors in Africa. He is also a member of Faculty at the Gordon Institute of Business Science, University of Pretoria, where he teaches and researches in sustainability and corporate responsibility.

Vis Reddy holds Master of Science degree (Environmental Geochemistry) from the University of Cape Town and has been involved in various aspects of environmental geochemistry over the past 22 years. He is a Registered Professional Natural Scientist (Pr. Sci. Nat South Africa 400091/03). He has specialised in air quality management and has worked on projects that include emissions monitoring, ambient air quality monitoring, dispersion and receptor modelling, air quality impacts assessments, training, Due Diligence Audits for property transfers and listings on the Johannesburg, and London Stock Exchanges and compliance audits focusing on air quality issues. He has worked extensively in sub-Saharan Africa and has either been a primary or co-author on numerous technical air, water and waste geochemistry reports. He is a reviewer on internally generated reports at SRK Consulting and has acted as a peer reviewer on external reports.

Andrew Wood holds a Doctor of Philosophy in Pollution Control degree from the University of Manchester, UK. He is a Chartered Member of the Institute of Biology of the United Kingdom (Reg. No. P0102053) and is a Fellow of the Water Institute of Southern Africa. He has been involved in water and waste management for the past 28 years, primarily in the industrial and mining sectors, but also extending to consulting to local, provincial and national authorities. Andrew has specialised in provision of advice to Due Diligence Audits, Environmental Compliance Audits, Environmental Impact Assessments and Development Planning (DPs) investigations where natural resources may be affected by developments and infrastructure management scenarios. Andrew also provides specialist advice where waste, process waters and effluent management may affect human health, surface and groundwater resources, the ecological environment and land resources.

2 Overview of 2010 complaint and investigations

2.1 Complaint[1]

In 2010, due to severe structural damage resulting from unanticipated corrosion, Mozal rebuilt the FTCs that treat fumes from anode bake furnaces. This necessitated Mozal to enter into 'by-pass' mode, releasing emissions directly into the atmosphere via stacks instead of passing through filters in the FTCs. The risk existed that this may increase ambient concentrations of key pollutants, specifically hydrogen fluoride (HF), particulate matter and tars.

The Mozambique Ministry of Environment (MICOA) issued a Special Authorisation to allow Mozal to enter into by-pass mode. An independent assessment was conducted prior to the by-pass to predict changes in emissions and ambient air quality concentrations during a by-pass situation. The independent specialist concluded at the time that the by-pass would not have resulted in significant health risks for local people.

On 26 October 2010, a coalition of Mozambican NGOs[2] lodged a complaint against Mozal with several independent accountability mechanisms. These mechanisms included the EIB Complaints Mechanism (EIB-CM), the IFC's Office of the Compliance Advisor Ombudsman (IFC CAO) and the OECD UK National Contact Point.

The allegations concerned the following items:

- A breach by Mozal of the EIB Statement of Environmental and Social Principles and Standards. Mozal operated under by-pass for 6 months during the rehabilitation of the smoke and gas treatment centres. This would result in air emissions without passing through filters which could have an adverse impact on the environment and surrounding local people (including Maputo).
- A lack of transparency from Mozal where communication with the complainants was unsatisfactory, slow, inconsistent and contradictory. Attempts were made to obtain documents and data related to the by-pass by the NGOs.

2.2 Investigations to date

Investigations to date have included the following:

- EIB-CM Initial Assessment from 13 to 17 December 2010 in cooperation with IFC CAO.
- Mediation process by the IFC CAO, and a compliance review by the EIB in February 2011. Readers should refer to the EIB-CM's "Conclusions Report" (dated April 2012) for findings and recommendations.

[1] *Information taken from the EIB-CM's Conclusions Report dated April 2012*
[2] *Justica Ambiental, Livaningo, Liga Mocambicana dos Direotos Humanos, Cetro Terra Viva, Kulima and Centro de Integridade Publica*

3 Overview of Mozal

The Mozal smelter is located approximately 17 km from Maputo in the Republic of Mozambique and is operated by BHP Billiton. It produces standard aluminium ingots at a nominal production capacity of 561 ktpa. Mozal sources power generated primarily by Hydro Cahora Basa via Motraco, a transmission joint venture between the national electricity utilities of South Africa (Eskom), Mozambique and Swaziland.

3.1 Aluminium smelter

The smelter consists of operations including:

- Reduction
- Carbon Plant
- Casthouse
- Maintenance
- Treatment and Logistics
- Harbour and Engineering.

It also includes support functions: Resource Planning and Development, Finance, General Management, Human Resources and Health, Safety, Environment and Community (HSEC).

3.1.1 Fume treatment centres

The operation of the Fume Treatment Centre (FTC) at the Carbon Plant was the focus of the 2010 complaint. The Carbon Plant produces 'pre-baked' anodes for use in the smelter. Air emissions generated by this process are scrubbed in the FTC before discharge into the atmosphere. The FTC primarily removes fluoride from the resultant emissions. Following the re-building of the FTC in 2010 event, it was recognized that more frequent maintenance of the FTC was required. Hence, on a weekly basis, one of the two FTCs is taken off-line for between 4-6 hours for maintenance while the Carbon Plant is still operational. The resultant emissions are emitted directly into the atmosphere resulting in the so-called stack by-pass operating condition. Stakeholders have queried whether this is normal practice at other aluminium plants e.g. BHP Billiton's Hillside smelter in Richards Bay, South Africa. Mozal indicates that the FTC at the Hillside smelter has a different configuration to the installation at Mozal. The Hillside FTC has a four filter unit which allows them to work on one unit while the other three are operational. At Mozal the FTC has a three filter unit and all three filters have to be shut down for maintenance while the Carbon Plant is operational, resulting in the need for the by-pass to be implemented weekly.

3.2 Harbour

The harbour site is situated approximately 12km from the smelter site. The harbour site consists of the following areas:

- Berth (Operated by the Maputo Port Development Company (MPDC), a parastatal)
- Raw materials receipt, storage and dispatch site (owned and operated by Mozal)
- Export yard - Final product storage and dispatch site (owned by Mozal and operated by a contractor).

3.3 Waste management facilities

3.3.1 Mavoco hazardous waste facility

Mozal has implemented a programme of on-site waste segregation, with dedicated waste bins and skips for separated wastes located at waste generation locations throughout the facility. Waste segregation assists to maximize the ability to recover and recycle wastes for on-site, and mainly off-site re-use, and to minimize the hazardous waste volumes and types disposed to the Mavoco hazardous waste landfill, as the only competent hazardous waste facility able to receive such waste in Mozambique. Waste collection and off-site recycling of hazardous wastes is contracted out.

Due to the absence of hazardous waste facilities able to receive such waste in Mozambique, in or around 2005, Mozal developed the Mavoco hazardous waste landfill to receive its hazardous wastes. SRK understands that the Mavoco landfill also receives hazardous waste generated by other industries besides Mozal. The landfill was developed on behalf of FUNAB, a component of MICOA, which owns and administers the site and the facility is currently operated by EnviroServe. The facility is engineered to more stringent standards than corresponding Mozambique or World Bank requirements at the time. It is reported that the landfill was designed and constructed in accordance with the South African Department of Water Affairs and Forestry's Minimum Requirements Guidance Programme of 1994 and 1998, which are considered to be of the most onerous of international landfill site design and operation specifications.

It was not possible to visit the Mavoco waste landfill during the audit. SRK understands that the operator (EnviroServ) commissions external audits of the operational performance of the Mavoco landfill, understood most recently to have been undertaken by Jones & Wagener from South Africa. Mozal is not directly provided with the external audit reports, but does undertake its own audits of Matola and Mavoco as part of its own corporate responsibility program. Internal audits of Mavoco by Mozal have apparently identified some minor issues with the operation and management that Mozal have communicated to the operators of the landfill. SRK notes that as the landfill is owned by FUNAB and operated under independent contract between FUNAB and EnviroServ, Mozal has no authority to require the findings of its internal audits to be rectified.

3.3.2 Hazardous waste disposal in South Africa

Much of the Mozal hazardous waste is transported by independent contractor (also EnviroServ) to South Africa for recycling and reuse, where the contractor identifies such to be practical/commercially beneficial to the contractor, and waste residues are disposed of to a licensed hazardous waste landfill. The auditors were shown a text message from EnviroServ, the hazardous waste service provider, which indicated that EnviroServ has a Basel Convention Certification for 2013 for the disposal of a defined tonnage or Mozal hazardous waste in South Africa. Mozal indicated that as the waste recycling and disposal is contracted out, the company has had some difficulties in arranging audits and verifying the performance status of the recycling and disposal of its hazardous wastes at facilities in South Africa. It may be assumed that the waste service provider is operating within the laws of Mozambique and South Africa.

3.3.3 Matola non-hazardous land-fill site

The Matola Municipality owns and operates the local non-hazardous waste disposal landfill. Mozal's Waste Management Plan indicates that the landfill is poorly operated and maintained. Audits by Mozal have apparently identified some issues with the operation and management of the landfill that have been communicated to the Matola Municipality.

Due to a lack of capacity at local authority level, and the poverty situation in Mozambique, it is expected that it will not be possible to prevent public access to the landfill and that wastes disposed

to the landfill will continue to be informally salvaged, exposing people to health risks, as is common with municipal landfills throughout Africa.

In the initial phases of Mozal's operations, in the absence of hazardous waste disposal capacity in Mozambique and prior to the commissioning of the Mavoco facility referred to in section 3.3.1 above, a dedicated area beside the Matola landfill site was acquired by a third party waste management company Interwaste, for the purpose of receiving and containing stabilized Mozal waste. This service was undertaken with the knowledge and permission of the Matola Municipality and MICOA.

The historical stabilized hazardous waste remains in the ring-fenced area adjacent to the Matola landfill, but no additional waste has been disposed since the Mavoco hazardous waste landfill was commissioned in about 2005.

In 2011, Golder Associates undertook an assessment as to whether the historical waste should be removed to a more suitable location but determined that the environmental risks posed by the historical waste did not warrant removal, and that it could remain *in-situ* in the ring-fenced location. The groundwater quality was reported to be comparable upstream and downstream, and did not exceed World Health Organization (WHO) drinking water guidelines. SRK understands that the ground water boreholes at Matola have been destroyed and on-going monitoring of groundwater quality is not undertaken by Mozal.

The Matola general landfill operation and monitoring is considered to be the responsibility of the Matola Municipality. While Interwaste is understood to own the former stabilized waste disposal site, Mozal does make provision in its Closure Plan for the management of the historical stabilized waste at Matola.

EnviroServ is currently contracted by Mozal to dispose of Mozal general and hazardous waste.

3.3.4 Non-hazardous waste recycling in Mozambique

As noted in section 3.3.1 above, Mozal has implemented a programme of on-site waste segregation, with dedicated waste bins and skips for separated wastes located at waste generation locations throughout the facility. Waste segregation assists to maximise the ability to recover and recycle wastes for on-site, and mainly off-site re-use, and to minimise the waste volumes and risk waste types disposed to the Matola landfill. Waste collection and off-site recycling of wastes is contracted out to EnviroServ.

3.4 Water management facilities

3.4.1 Raw water supply and treatment

The primary Mozal water supply pump station is situated approximately 16km from the smelter site. The Mozal pump station supplies water to the Mozal site and is operated and maintained by Mozal within the EMP and License conditions.

The raw water received by Mozal is treated on-site to potable water quality for domestic consumption and process use where good quality water is required. The treatment technology of chemical flocculation, multi-media sand filtration and chlorine disinfection is reported to be adequate to meet the required water quantities and quality.

While Mozal is able to control its water demand within the EMP and License conditions, and the Water Management Plan does promote water conservation and demand management, access to water within the local community is limited, and access to assured potable water quality further limited, due to the lack of capacity with the local authorities.

3.4.2 Wastewater management

The plant area of Mozal is provided with a competent wastewater and dirty stormwater drainage system collecting the sites wastewater and affected stormwater into a detention pond system, preceeded by a sediment and oil trap.

The wastewater and stormwater system is operated and maintained by Mozal within the EMP and License conditions, which permits wastewater/stormwater within the detention pond system to be analysed, and dependent upon the quality determined, the excess water may be diluted with clean process blowdown water, or river water abstracted from upstream of the discharge point, to obtain a discharge quality within license conditions. Mozal targets a 17mg/l F limit for discharge to the receiving water course/estuary, to provide some contingency within the license limit of 20mg/l F.

The wastewater and stormwater drainage systems, and the detention pond system, appears to have been engineered and constructed to accepted capacity and conditions for such facilities, and as required by the EMP and Licence conditions, and were observed to be in a generally good operational condition. The detention ponds and sediment trap are desilted as required. Removed silt is disposed as waste.

3.4.3 Sewage treatment

The plant area of Mozal is provided with a competent sewerage system reticulating sewage generated by Mozal employees and visitors to a dedicated sewage treatment plant located approximately 1.5 km from the Mozal site.

Mozal developed the sewage treatment works to receive its sewage in the absence of sewage treatment facilities in the local area able to receive such sewage. The sewage works was engineered to more stringent standards than Mozambique or World Bank requirements at the time. It is reported that the sewage works was designed and constructed in accordance with the South African Department of Water Affairs and Forestry's Sewage Treatment Guidelines and to meet South African treated sewage discharge quality limits, which are considered to be of the most onerous of international sewage works design and operation specifications.

The sewage works is operated and maintained by external contractor appointed by Mozal within the EMP and License conditions and was observed to be in a good operational condition. The treated sewage effluent is discharged to a tributary of the stream that receives the Mozal wastewater entering the estuary. Mozal has recently established a pump and pipeline system to recover some treated sewage for reuse within the casthouse operations. Sludge drying beds are emptied as considered to be required, and removed sludge reportedly disposed to the Matola landfill.

Whilst Mozal is able to treat its sewage to an acceptable quality for discharge to the environment, access to competent sanitation facilities and sewage treatment within the local community is limited, due to the lack of capacity within the local authority.

4 Audit process and method

4.1 Scope of work

The scope of work involved the following items:

- High-level review of environmental management systems (focussed on air emissions, wastewater and water quality, and waste), including
  - Organisation and human resources;
  - Procedures;
  - Norms and standards;
  - Prevention, control and mitigation;
  - Sampling and analysis methods;
  - Monitoring and reporting;
  - Impacts on community health and safety; and
  - Emergency response mechanisms and procedures.
- Review of air emissions and ambient air quality management systems, including:
  - Air pollutants: PM, PAH, HF, VC, metals, dry gas;
  - Emissions monitoring: FTCs, GTCs and fugitive emissions (roof vents); and
  - Air quality monitoring (locations, frequency, sampling and analysis methods).
- Wastewater and ambient water quality management systems, including:
  - Process wastewater, wastewater from operations, runoff from process and material staging areas, storm water and other;
  - pH, temperature, suspended solids, heavy metals, cyanide, oily and volatile materials; and
  - Monitoring of ambient water quality (locations, frequency, sampling and analysis methods).
- Waste management systems, including:
  - On-site and off-site waste storage, treatment and disposal; and
  - Hazardous waste management.

4.2 Generic steps

The audit was undertaken in October and November 2013 and culminated in an audit report (this report) and recommendations. The steps undertaken in the audit process involved the following generic evidence gathering, verification and reporting tasks:

- Collecting and evaluating documents and reports in relation to the audit framework;
- Interviews and discussions with Mozal management, including senior management at executive and operational levels, staff responsible for the day-to-day management of environmental and social issues, about the effectiveness of systems and processes;
- Observing and inspecting management practices on site, including a high level review of systems and processes for collecting and managing information and data;
- Attending, as an observer, an Interested Parties meeting with key stakeholders; and
- Reporting, including the production of an audit report and recommendations.

4.3 Activities

4.3.1 Initiation meeting with EIB

An initiation meeting with the EIB (Felismino Alcarpe and Alfredo Abad) was held on 23 October 2013 at SRK offices in Johannesburg. The meeting functioned to provide SRK team members with

background on the complaint and its prior investigation, and the context and expectations of the audit.

4.3.2 Site visit

A site visit was undertaken by Donald Gibson, Vis Reddy and Andrew Wood from 28 to 30 October 2013. They were supported by members of the Mozal HSEC team. The main activities undertaken for each day are summarised in Table 4-1.

Table 4-1: Daily activities undertaken on the site visit

Day	Activities
Day 1, Monday 28 October	• Safety induction at the Mozal Reception • Opening meeting with the Mozal HSEC team, the Asset President Danie Murray, and the EIB team • Discussion with EIB on the outcomes of the meetings held with complainants and Mozal • Orientation drive through of the smelter facility • Document review
Day 2, Tuesday 29 October	• Attendance at the bi-annual Interested Parties Meeting • Discussion with Daniel Nhapulo, Legal Advisor on the enforceability of EIB's audit recommendations • Discussion with Leocadia Naiene, Environmental Improvement Superintendent was held regarding internal auditing procedures and document control. • Discussion with Marsilan Pillay regarding laboratory processes • Walk through the pot rooms to view the Boreal Lasers in operation and routine operation of the pot room with Marsilan Pillay • Discussion with Hermino Cloete about operation of the air emissions abatement systems at the reduction plan ((GTC) and the carbon plant (FTC)equipment • Discussion with Luis Duarte and review of some of the air monitoring protocols or Best Operating Practice (BOP) documents. • Document review
Day 3, Wednesday 30 October	• Inspection of the water reservoir and the sewage treatment works. • Discussion with Rubao Come, Community Specialist on social and stakeholder engagement issues • Discussion with Alex Sitoe on the overall environmental management system including policies, grievance mechanism, internal audit procedures, management system software and document control • Discussion with Domingos Tete (Mozal Fire Chief), on emergency preparedness and response • Closing meeting with the Mozal HSEC team to communicate key observations • Document review

During the course of the site visit Raymond Spires was available to clarify any queries that SRK may have had regarding observations. Additional correspondence with Alex Sitoe and Daniel Nhapulo was held subsequent to the site visit and relating to outstanding information requirements.

4.3.3 Document review

Certain documentation was provided to SRK by the EIB on 23 October 2013 before the site visit. Additional information was collected during the site visit from Mozal. A full list of documentation reviewed is included in Appendix A.

4.3.4 Meeting with Sean O'Beirne

A meeting was held with Mr Sean O'Beirne, Mozal's long-standing independent environmental consultant, on Friday 1 November 2013. Mr O'Beirne has been responsible for several years for compiling Mozal's Annual Monitoring Report for the IFC, was involved in the Environmental and Social Impact Assessment (ESIA) studies that were undertaken for the facility and understands the facility well. The purpose of the meeting was to discuss SRK's observations and obtain clarification and feedback on them.

4.3.5 Preliminary feedback to EIB

Preliminary feedback was provided to Alfredo Abad on Thursday 7 November 2013, and to both Alfredo and Felismino Alcarpe on 17 December 2013.

4.3.6 Reporting

This report, drafted in November 2013, revised in January 2014 and again in March 2014 incorporating Mozal comments, constitutes the audit findings.

4.3.7 Mozal comments

The draft report was provided to Mozal for review in January 2014. Mozal provided comments, electronically, on the draft report in the form of requests for clarification in March 2014. A meeting to discuss comments was held with Mozal in Maputo on 11 March 2014.

4.4 Audit framework

This section presents a high-level summary of the audit framework relevant to Mozal's management of environmental issues. Refer to Appendix A for a full list of reference documents. Comment on the current status of alignment with the key elements of the assessment framework is given in Section 7.

While Mozal uses previous versions of World Bank Group standards (that were in existence in 1998) as reference standards, the standards detailed below and used for this audit represent current Good International Industry Practice (GIIP). Previous versions of the World Bank Group standards have been superseded by more recent versions that reflect continuous improvement in management practice and progress in scientific understanding.

4.4.1 International Standards Organisation 14001:2004

This standard (Edition 2 and tech. corr. 1) specifies requirements for an environmental management system. The overall aim is to support environmental protection and pollution prevention in balance with socio-economic needs. It aims to enable an organisation to develop an environmental policy, establish objectives and processes to achieve the policy commitments, take action as needed to improve its performance and demonstrate conformity of its system the ISO requirements.

The standard is based on the Plan-Do-Check-Act (PDCA) methodology.

4.4.2 IFC Performance Standards 1, 3 and 4

The IFC Performance Standards on Environmental and Social Sustainability (IFC Performance Standards), which were published in January 2012, are recognised as being the most comprehensive standards available to international finance institutions working within the private sector. The principles provide a framework for an accepted international approach to the management of social and environmental issues.

The IFC Performance Standards applicable to this audit are entitled:

- **PS1**: Assessment and Management of Environmental and Social Risk Impacts
- **PS3**: Resource Efficiency and Pollution Prevention
- **PS4:** Community Health, Safety and Security

Performance Standards 2,5,6,7 and 8 are excluded from this audit.

IFC Performance Standard 1 establishes the importance of:

- integrated assessment to identify the social and environmental impacts, risks, and opportunities of projects;
- effective community engagement through disclosure of project-related information and consultation with local communities on matters that directly affect them; and
- the client's management of social and environmental performance throughout the life of the project.

IFC Performance Standards 2 through 8 present requirements to avoid, reduce, mitigate or compensate for impacts on people and the environment, and to improve conditions where appropriate. Where social or environmental impacts are anticipated, the client is required to manage them through its Social and Environmental Management System consistent with Performance Standard 1.

4.4.3 World Bank Group Environmental, Health and Safety Guidelines

The 2007 EHS Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP), as defined in IFC's Performance Standard 3 on Resource Efficiency and Pollution Prevention[3].

The EHS Guidelines contain the performance levels and measures that are normally acceptable to IFC and are generally considered to be achievable in new facilities at reasonable costs by existing technology. For IFC-financed projects, application of the EHS Guidelines to existing facilities may involve the establishment of site-specific targets with an appropriate timetable for achieving them. The environmental assessment process may recommend alternative (higher or lower) levels or measures, which, if acceptable to IFC, become project- or site-specific requirements.

When host country regulations differ from the levels and measures presented in the EHS Guidelines, projects are expected to achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, a full and detailed justification for any proposed alternatives is needed as part of the site-specific environmental assessment. This justification should demonstrate that the choice for any alternate performance levels is protective of human health and the environment.

New versions of the EHS Guidelines became effective from April 2007, and replaced those documents previously published in Part III of the Pollution Prevention and Abatement Handbook and on the IFC website[4]. Along with the General EHS Guidelines (2007), the following sector-specific guidelines are considered applicable to the project:

- EHS Guidelines, General EHS Guidelines (2007)
- EHS Guidelines for Base Metal Smelting and Refining (2007)
- EHS Guidelines for Ports, Harbours and Terminals (2007)
- EHS Guidelines for Electric Power Transmission and Distribution (2007)
- EHS Guidelines for Waste Management Facilities (2007)
- EHS Guidelines for Water and Sanitation Facilities (2007).

[3] *The information in this section has been taken and modified from http://www.ifc.org/ifcext/enviro.nsf/Content/EnvironmentalGuidelines.*
[4] *See http://www.ifc.org/ifcext/enviro.nsf/Content/EnvironmentalGuidelines.*

4.5 Limitations

4.5.1 General

- Having regard to the scope of the engagement, and unless otherwise stated or qualified in the text, nothing came to SRK's attention that leads it to believe that the findings and observations presented are not correct
- The Head of External Affairs, Samuel Gubo, who is accountable for stakeholder engagement, was not available for interview. Discussions with Rubao Come from the HSEC team were held instead.
- The audit was confined to the smelter facility and the landfill sites. It did not include the port facility.
- No photographs were permitted at the smelter premises.
- No discussion with regulatory authorities of stakeholders was undertaken at the time of the assessment in respect of environmental management activities and performance.
- No independent samples were collected or analysed for characterisation and verification purposes.
- No independent analytical programme quality assurance and quality control verification was undertaken.

4.5.2 Air quality

- The assessment was solely based on information provided by Mozal (originated *from* independent surveyors), the EIB and discussions with Mozal personnel who were available at the time of the audit, Sean O'Beirne from SE Solutions, the Mozal site walk-over and drive-around accompanied by Mozal personnel during the period.
- It was not possible to visit the import and export handling facility in the Port of Maputo at the time of the assessment. Any comment given on this facility is based on discussions with Raymond Spires, any information referring to the port facility in the 2011, 2012 and 2013 Annual Monitoring Report, a review of aerial photographs and a review of the process flow diagram at the facility.

4.5.3 Water and waste management

- The assessment was based on information provided by Mozal, discussions with Mozal personnel, and the Mozal site walk-over and drive-around accompanied by Mozal personnel.
- It was not possible to visit the Matola non-hazardous waste landfill, or the Mavoco hazardous waste landfill, to which Mozal wastes are disposed, at the time of the assessment.
- It was not possible to meet with waste service providers or to visit the sites in Mozambique or South Africa where non-hazardous waste and hazardous waste generated by Mozal, is re-used or disposed, at the time of the assessment.

5 Findings and observations

5.1 ISO 14001:2004 and IFC Performance Standard 1

The IFC PSs cover areas which are viewed as essential aspects of good international environmental and social performance.

Policy is adequately covered by the series of Group and Asset Level Documents (GLDs and ALDs), and is guided by the values listed in the BHP Billiton “Our Charter”. This charter lists six values: sustainability, integrity, respect, performance, simplicity and accountability, which form a solid framework to guide the environmental and social philosophy of Mozal. Mozal should however consider revising key documents to include more explicit reference to applying current or prevailing international standards and GIIP in particular.

Mozal’s EMS conforms to the requirements of the ISO14001 standard and the IFC’s Performance Standard 1 requirements for management systems. The EMS is ISO14001 certified and is documented in a series of GLDs and ALDs, notably, the EMS document (ALD10026 Version 1.0) dated 17 April 2013. This describes the components of the EMS, including roles and responsibilities, the structure of the EMS in the form of ‘performance requirements’, and in the form of the Plan-Do-Check-Act methodology. There may be a need to align the systems process requirements of the environmental and social management systems, and particularly the documentation of the social aspects of the management system.

5.1.1 Planning

Mozal undertakes adequate planning activities to guide management system implementation. An aspects and impacts register is maintained and updated periodically, although it is proposed that more emphasis is placed on analysis and interpretation of trends in monitoring data. These interpretations particularly for significant aspects should be incorporated into adaptive management approaches.

While supplier assessment occurs according to a Contractor Management Plan, few environmental issues are included in the assessment, as it focuses mainly on health and safety issues. There are however induction and training processes for contractors that include environmental issues.

Legal compliance monitoring is adequately conducted by the legal counsel in collaboration with the HSEC team.

The EMS contains sufficient coverage of objectives, targets and programmes as well as performance indicators. Performance requirements are set at various levels including Group, Asset and Department. Mozal has a Balanced Scorecard approach that incorporates numerous sustainability related indicators. This exists at asset level and for each department.

Six environmental management plans exist covering overall Environmental Management, Water, Air Emissions, Energy and Greenhouse gases, Waste and Land. Two social management plans exist covering Stakeholder Engagement and Community Development.

5.1.2 Implementation and operation

Mozal has defined roles and responsibilities for maintaining and implementing the EMS. The HSEC department is responsible for the governance requirements of environmental and social management. The Head of HSEC is a member of the Asset Leadership Team reporting to the Asset President, and weekly meetings are held with the participation of the Asset President, superintendents and supervisors, and so senior support is evident.

The capacity and resources of the HSEC team appears to have improved since 2010, which then had a single superintendent responsible for SHE issues. Additional capacity exists and represents execution, improvement and reporting functions within the HSEC team. From the interviews conducted and discussions held, and without having reviewed qualifications and experience, staff members appear adequately skilled and competent to undertake their designated responsibilities. Staff members have a 'training profile' which links training requirements to individual key performance indicators. Regarding financial resources the Head of HSEC believes that the department and company have sufficient budget to maintain and implement the EMS. The HSEC budget for FY14 is US$7.8 million, including $1.5 million for corporate social investment, $500,000 for surveys and administration; and there is reportedly sufficient budget for sampling, and the on-site clinic.

Adequate induction and training of employees and contractors on environmental, health and safety, and waste minimisation issues is conducted to ensure awareness. Additional awareness raising and capacity building on GIIP may be required for HSEC team members and operations managers.

5.1.3 Operational controls

Mozal has implemented GIIP in terms emergency preparedness and response. A Crisis and Emergency Management Plan exists, although the document is now due for review. Mozal has sufficient capacity to handle routine incidents for on-site workers. For bigger incidents it also has backup from external service providers and if required, evacuation of injured staff to Nelspruit in South Africa is available. Mozal also has some capacity to assist affected communities in the event of a minor emergency. Discussions with the Mozal Fire Chief suggested that the local government has limited capacity to effectively respond to a major emergency situation; hence Mozal has taken steps to ensure that it has as a minimum the capacity to respond to an emergency at its facility. It is recommended that Mozal engage with local government to determine what capacity it has to manage emergencies and disasters, and identify opportunities for co-operation.

5.1.4 Checking

Numerous mechanisms exist for assessing EMS processes and performance including monitoring, compliance evaluation, non-conformance, certification and internal audits. This HSEC team may be suffering from "audit fatigue" due to the number of audits undertaken. A detailed ALD exists (ALD.MOZ.197) outlining the methodology for conducting a Management Review of the Health, Safety, Environment and Community Management System and the principles and responsibilities for performing internal audits on the HSEC Management System. This links to Group Level Documents: STA.023 HSEC Assurance and Self-Assessment Procedure. BHP Billiton also undertakes an internal audit every 2 years.

Regarding external audits, in 2012 MICOA instituted requirements to undertake annual legal compliance audits done by accredited Mozambican consultants. The IFC on behalf of Lenders also required 'Annual Monitoring Reports' to be compiled, and while these were compiled by an external specialist, there was likely limited assurance or verification of data to the extent necessary for external assurance purposes. Until 2007 SRK Consulting was appointed to 'assure' the annual monitoring reports. The opportunity exists for Mozal to extend the use of external specialists to assure its data and assist with analysis and interpretation of trends. This would serve to ensure that potential risks such as future exceedance of ambient or emission limits are proactively managed.

Records including documentation and data are managed according to defined procedures.

5.1.5 Acting

A detailed ALD exists (ALD.MOZ.197) outlining the methodology for conducting a Management Review of the Health, Safety, Environment and Community Management System. Reviews of the EMS are conducted annually in March (most recent one was done in February 2013) in review meetings chaired by the Asset President. The meetings also include department managers, HSEC superintendents and other parties. The outputs of the review are used to improve the EMS and resourcing needs. No information indicates that the same processes are undertaken for the 'community' aspects of HSEC. Mozal should confirm this or ensure that the community aspects of the HSEC management system review are conducted and appropriate management system standards and others (such as the IFC Performance Standards and ISO26000 on Social Responsibility) are applied.

5.2 Stakeholder engagement

Commendably, there appears to have been an escalation in the importance of stakeholder engagement and relationships since the 2010 complaint. Previously, HSEC was responsible for stakeholder engagement, hosting two separate documents for the environmental and community aspects of stakeholder engagement. An internal audit and governance review indicated that a central 'home' was required, and so the Head of External Affairs, Samuel Gubo, is now the 'owner' of stakeholder engagement, working in collaboration with the HSEC team.

A Stakeholder Engagement Plan (SEP) exists (ALD100015) that covers the generic requirements of GIIP. There are numerous mechanisms for engagement, notably a 6-monthly "Interested Parties" meeting, quarterly consultative meetings to align community investment projects with government priorities, and regular meetings with local community leaders.

In terms of the status of relationships, SRK's opinion is that Mozal proactively engages with communities and the Mozambican government, and in this connection notes the positive influence exerted by the community development involvement of the Mozal Community Development Trust. It was noted that not all the NGOs were present at the Interested Parties Meeting on 29 October 2013. Acknowledging that Mozal has invited participation of non-governmental organizations, the relationship with certain members of the Coalition of Non-Government Organizations (NGOs) that laid the grievance in 2010 would benefit from additional relationship-building efforts by both parties. We note that the complainants have expressed a wish to receive written information on performance more regularly than relying only on the 'Interested Parties' meetings at which verbal disclosure is given. Mozal has attempted to repair the relationship with the NGOs using various means, but a more proactive engagement strategy is recommended to avoid as far as possible confrontation with potential antagonistic stakeholders.

The grievance procedure appears to operate efficiently, although it is unclear if there is a separate document on grievances in addition to the section on 'issues management' in the SEP. SRK recommends that a more detailed grievance procedure for external stakeholders be documented, in line with international guidelines such as the IFC's guideline on grievance procedures.

The key area for improvement is public disclosure of information and data. Management Plans and audit reports are mostly internal Mozal documents and are not publicly disclosed. Complaints from the coalition of NGOs referred to the lack of transparency, openness, timeliness and ease of engagement with Mozal in relation to the 2010 by-pass, and specifically related to the availability of monitoring and modelling data. In discussion with Mozal, it was evident that there is some concern regarding public disclosure of written information and in particular fear of misinterpretation.

While mechanisms exist for information disclosure, Mozal should consider appropriate mechanisms for dissemination, and where appropriate, provision of disclose and obtain feedback on various types

of information, such as the management plans (which are internal documents), results of performance assessments (including the MICOA annual audit), and data on key issues. The Mozambican government has indicated that there is a proposed national forum for NGOs focussing environmental issues, and this might be explored as a vehicle for dissemination and engagement on more performance-related and scientific information.

Engagement tailored to the interests of stakeholder groups should continue to be based on stakeholder mapping and analysis, and those engagement mechanisms for the disclosure of performance data and outcomes should be prioritised by Mozal.

5.3 IFC Performance Standards 3 and 4

5.3.1 Air quality management

Mozal has developed and adopted an Air Emissions Management Plan (ALD10017) (AEMP). The objective of the plan is to ensure the all Mozal atmospheric emissions are monitored and controlled and do not result in a significant impact on human health and the environment. The plan has adopted BHP Billiton environmental management principles, GIIP, where applicable, and compliance is measured against various international standards where local standards are not available. It should be noted that while the plan refers to air emissions management, guidance is provided on ambient air quality monitoring including ambient air quality limits. These limits were informed by the findings of the original air quality impact assessment studies that were conducted prior to the commissioning of the original smelter in 2000. While some of the international emissions and ambient air quality standards that were adopted at the time may have changed since then, they are currently still in use as per agreements with the Mozambican authorities (MICOA).

The AEMP appears to be prepared by HSEC personnel and reviewed/signed-off at various levels of management and operational personnel who appear have taken responsibility for the plan. This is taken to imply that the plan is accepted as:

1. Being technically correct and complete for the management of the environmental aspect
2. Being compliant to national legislation and corporate responsibilities
3. Having appropriate resources (financial and human) to be implemented
4. Providing the basis for internal and external auditing
5. Being subject to regular review and updating, as necessary.

The AEMP provides some contextual description, generally describing conditions in 2010. While the accuracy of the description of the existing environment was not verified during this audit, general observations of the area surrounding the facility and a review of aerial photographs indicate that there has been substantial growth of both residential and industrial developments in the vicinity of the facility since it was commissioned in 2000.

Stack emissions and ambient air quality management

The potential risks and impacts due to air emissions on ambient air quality were assessed prior to the establishment of the Mozal facility when the original ESIA was conducted. In response to this, various health and safety protocols have been prepared in-line with GIIP, WBG EHS Guidelines and BHP Billiton's performance requirements with respect to air quality management. Hence in order to monitor the ongoing risks and impacts associated with air emissions, stack emission and ambient air quality monitoring systems were established to inform management and mitigation measures. With respect to avoidance of risks and impacts from all of the main sources of air emissions, air emission abatement control equipment, which is in line with GIIP, and that, which will enable Mozal to comply with its licence conditions including source emission guidelines, as well maintain ambient air quality concentrations at levels below the ambient air quality guidelines that have been set for this project.

Extraction hoods that collect fumes from the pots are directed to the gas treatment centres (GTC) where fluoride (dust and gas) and total dust is removed from the gas stream before discharge to atmosphere. The inlet and outlet to each GTC stack is monitored twice a month over 24-periods for HF gas, particulate fluoride and total dust.

Pot fumes are released and ventilated through roof vents when pot hoods are removed for operational and maintenance purposes. Roof vent emissions are not controlled and rely partly on the existing extraction hood system to collect pot fumes that are emitted when the pot hoods are removed. Roof vent emissions are monitored continuously at two of the pot lines (B and C) over a

span of 36 pots for HF gas and it is assumed to be representative of emissions at all of the pot lines given the similarity and consistency of the process. The total roof vent emissions are calculated on the measurements at pot lines B and C. This is further supplemented by twice monthly roof vent sampling for fluoride and dust analysis.

Emissions from the carbon plant are treated at the fume treatment centre (FTC) prior to discharge to atmosphere. Opacity measurements are conducted continuously as an indicator of combustion efficiency in the bake furnaces and indirectly measure dust and tar emissions. Each FTC stack is monitored twice a month over a 24-hour period for Tars (BAP – benzo(a)pyrene). HF gas, particulate fluoride and total dust are monitored once a month. Total dust (PM) SO_2 and NO_2 are monitored on a discontinuous basis by an external specialist and especially during specific events e.g. long period of stack by-pass e.g. February to May 2013.

Ambient air quality monitoring is conducted on an *ad hoc* basis by an independent company. During the FTC by-pass event the frequency of ambient monitoring events is increased e.g. long periods of stack by-pass February to May 2013 where $PM_{10,}$ $PM_{2.5}$, HF, SO_2, NO_2, BAP and dust deposition were targeted. $PM_{10,}$ HF, SO_2, NO_2, and dust deposition were targeted during a monitoring campaign from 27 March to 24 April 2012.

Emissions

The annual monitoring report (AMR, September 2013) prepared for the IFC made the observation that there has been a progressive increase in fluoride emissions over the past 8 to 9 years primarily due to increased roof vent emissions. The increase in roof vent emissions can be explained largely by changes in the stability of power supply after 2006. From early 2008 onwards, there was repeated load-shedding which saw increased anode effects (often requiring the removal of the pot hoods) and an associated increase in emissions into the pot rooms. Despite the increase in fluoride emissions the fluoride emission levels are still below the agreed fluoride emissions target of 1kgF/tonne aluminium[5]. According to the AMR there are several initiatives geared towards reversing this trend in emissions to ensure that they remain within the WBG EHS emission limits. These include the efforts made to reduce anode effects by removing the fines from the incoming alumina streams, improving anode covering, as well as a progressive replacement of the pot hoods to ensure that fugitive emissions into the potrooms are effectively controlled. Mozal recognises that further interventions will be required to stop the emissions from exceeding an internal target of 0.8kgF/tonne aluminium which has occasionally been breached in 2009 to 2012.

The AMR does not make mention of any long term emission monitoring data and trends for dust, Tars (BAP – benzo(a)pyrene), sulphur dioxide (SO_2) and nitrogen dioxide (NO_2,) which are identified as parameters of concern in the AEMP.

Ambient air quality

Exceedances of the ambient air quality standards listed in the AEMP have been identified as indicators of impacts. Ambient standards have been adopted for hydrogen fluoride (HF – US Agency for Toxic Substances Disease Registry (ATSDR) daily average limit, 2003), fallout dust (PM_{10} and $PM_{2.5}$, WHO air quality guidelines, 2005 Global Update), Tars (BAP – benzo(a)pyrene, EU limit value for BAP, January 2012), sulphur dioxide (SO_2, IFC guidelines) and nitrogen dioxide (NO_2, IFC

[5] *The IFC has agreed to a total fluoride emission target of 1 kg F/tonne aluminium)*

guidelines)[6]. The limited ambient data suggest that except for dust (PM_{10} and $PM_{2.5}$) there are no significant exceedances of the respective standards that have been adopted in the AEMP during normal operating conditions. However during upset conditions e.g. stack by-pass conditions the potential for exceedances of the applicable ambient air quality guidelines for the various parameters increases.

Ambient air quality monitoring during the FTC rebuild period (October 2010 to April 2011) reported measured ambient air quality concentrations that were slightly higher than predicted by the dispersion model (but still below human health thresholds). It is thought that the higher measured concentrations relative to the model were a function of the dispersion model generally under-predicting the ambient concentrations and, in the case of dust, background sources were a contributing factor to concentrations being above the predicted values. However notwithstanding the above, it was noted that the actual measured concentrations were well within expectations for fluorides, dust and BAP when compared against the respective ambient air quality guideline limits.

Ambient air quality monitoring during the stack by-pass period of 28 February to 1 May 2013 indicated that average 24-hour PM_{10} and $PM_{2.5}$ concentrations were lower during the by-pass event relative to pre-by-pass levels but similar to levels post the by-pass period (SGS, March 2013). Exceedances of the ambient 24-hour SO_2 WHO guideline was observed on seven occasions during the by-pass period, no exceedances of the 24-hour WHO guideline was recorded observed for NO_2, none for HF during the by-pass period but three exceedances of the ATSDR guideline were observed during the baseline monitoring period (pre-stack by-pass period) and one exceedance each was observed for BAP during the by-pass period and after the by-pass period. In the case of HF it was concluded that Mozal may have been the main source of this exceedance whereas the other exceedances may be due to a combination of background sources and Mozal.

Notwithstanding the observations made during the by-pass events, ambient PM_{10} and $PM_{2.5}$ levels do exceed their respective 24-hour ambient concentrations occasionally during normal operational conditions. The 2013 AMR attributes these exceedances to other background sources that contribute to the elevated PM_{10} and $PM_{2.5}$ dust levels.

SGS concluded that during stack by-pass conditions, ambient 24-hour SO_2 concentrations increased exceeding the WBG EHS guideline of 20 µg/m^3 and indicated that this was likely to be due to the by-pass event. However it should be noted that the Mozal maximum limit of 125 µg/m^3 was not exceeded during this period.

Ambient NO_2 concentrations are below the respective guidelines.

A continuous monitoring station has been installed at the MCDT site located to the southwest of the Mozal plant. The monitoring station was not operational at the time of SRK's site visit. The previous location was not ideal due to its proximity to the smelter and the data generated was unreliable. When operational, the station will monitor PM_{10}, $PM_{2.5}$, SO_2, NO_2, poly-aromatic hydrocarbons (PAHs) and hydrogen fluoride. The move of the air quality monitoring station means that there are no data available from the station as yet. This station needs to be brought back into operation as soon as possible. Mozal has indicated that the ambient monitoring station will be operational in April 2014.

5.3.2 Water and waste management

The following section summarises salient points in respect to the auditors' observations of Mozal's water and waste management practices and impact monitoring.

[6] Mozal has emission guidelines for perfluorocarbons (PFCs) but this is not discussed here as PFCs are greenhouse gases and this has been excluded from the scope of this review.

Environmental performance in respect to water and waste management is considered to be generally compliant with the EMP and License conditions, and the principles of the IFC Performance Standards.

Mozal is considered to have adequate knowledge and resources within the HSEC team, and associated business units, to effectively implement the water and waste management requirements of the EMP and License. Separate Water Management and Waste Management Plans have been drafted to guide and monitor compliance and Mozal programmes audits performance of the internal business units and external waste management service providers.

Mozal should review the existing water and waste management plans to assess opportunities to change a procedural based management and monitoring plan to a more proactive interpretive and initiative based programme. This will enable trends in water quality and waste management to be more readily identified and opportunities to timeously react to deteriorating trends, or beneficial trends, to be identified and actioned.

Performance Standard 3: Resource Efficiency and Pollution Prevention

The Water Management and Waste Management Plans have been prepared, and regularly updated, by HSEC personnel and reviewed/ signed-off by a comprehensive list of all levels of management who appear to be adopting responsibility for the plans by providing signatory to the plans. Signatory by all levels of management is taken to imply that the plans are accepted as being i) technically correct and complete for the management of the environmental aspect, ii) compliant with national legislation and BHP Billiton Group requirements, iii) that the Plans have appropriate resources (financial and human) to be implemented, iv) that the Plans provide the basis for internal and external auditing, and v) are subject to regular review and updating, as necessary.

It is not evident, in documentation currently available to the auditors that the project life-cycle (construction, operation, decommissioning and closure), is comprehensively considered in the current water management and waste management plans. The following recommendations for improvement are provided for Mozal's consideration:

- **Consider ambient conditions**. Baseline environmental conditions and impact assessments described in the Water Management and Waste Management Plans generally reflect the conditions identified for the original EIA and License application, rather than an effective description and assessment of current ambient conditions and impacts.
- **Apply technically and financially feasible resource efficiency and pollution prevention principles**. The wastewater and sewage management technologies are appropriate to current operations and treated sewage is recovered into process operations. However, it is not generally considered good practice to abstract river water from upstream of a wastewater discharge point to dilute wastewater quality prior to discharge, unless the environmental impact/risk of such elevated wastewater load is determined to be acceptable. The wastewater discharge quality, though compliant with the Licence conditions, infers that there may be opportunity to further develop the pollution prevention measures at the sources of waste and wastewater pollutant load.

  Despite the observations above, there is general compliance with the principles of the environmental license, and general effort to control and manage pollution potential including specific efforts in respect to general housekeeping and making each business unit responsible for the waste it generates.

  Due to the general lack of waste management facilities and services, and waste recycling opportunities in Mozambique, and lack of waste service competition, a substantial financial burden is placed on Mozal to dispose of hazardous waste in South Africa. Mozal is, and should

be, investigating opportunities to recycle hazardous waste within Mozambique, and to reduce the loads requiring export into South Africa.

- **Apply techniques best suited to avoid or, where not possible, minimize adverse impacts on human health and the environment.** The wastewater and sewage management technologies are appropriate to current operations and License conditions and waste management services are contracted out. The techniques are appropriate to ensure that the wastewaters and wastes that Mozal generates will minimize any adverse impacts on human health and the environment.
- **Tailor principles and techniques to hazards and risks associated with project's nature and consistent with GIIP including WBG EHS Guidelines**. Mozal has a comprehensive programme to assess business and environmental hazards and risk, and the Water Management and Waste Management Plans are regularly reviewed which should enable on-going programmes to continue to tailor operational and management protocols, procedures and practices to effectively identify developing hazards and risks associated with Mozal's activities as they affect water and waste management, and consistent with GIIP including WBG EHS Guidelines.

IFC Performance Standard 4: Community Health and Safety

The EIA undertaken for the authorisation of the Mozal plant remains the guidance for on-going water and waste management, and provides the basis of the monitoring programmes to evaluate the impact of water use, wastewater discharge and waste disposal that have been adopted as the basis of the Water Management and Waste Management Plans.

Discharge of wastewater and treated sewage to the aquatic environment is controlled according to the licensed discharge quality limits, and disposal of wastes according to prescribed methods by waste service providers to authorised disposal facilities. No indication of detrimental impacts on the health and safety of affected communities during project life cycle have been reported to date.

The disposal of non-hazardous waste to the Matola Municipal landfill is identified as a concern as the landfill is reportedly poorly operated and subject to human scavenging, but is the authorised municipal landfill. The disposal of hazardous waste to the Mavoco hazardous waste landfill is specifically intended to reduce the risk to human health as the landfill is designed, and should be operated to appropriate standards for hazardous waste disposal by an external waste service provider.

The Water Management and Waste Management Plans promote preventive measures consistent with GIIP, such as the WBG EHS Guidelines, promote the identification of risks and impacts and provide mitigation measures which favour the avoidance of risks and impacts over minimization.

Mozal segregates and organizes the recycling of suitable sections of its waste, and disposes of its non-hazardous waste and hazardous waste that cannot be recycled in accordance with the EMP and License conditions. Whilst the hazardous waste disposal is controlled and secure, due to a lack of capacity at local authority level, and the poverty situation in Mozambique, it is expected that it will not be possible to prevent public access to the non-hazardous Matola Municipal landfill and that wastes disposed will continue to be informally salvaged, as is common with municipal landfills throughout Africa.

Wastewater discharge to the estuarine section of the receiving watercourse is not likely to be directly reused by downstream communities, other than potential harvesting of fish and molluscs from the watercourse.

Mozal has initiated a programme to recover treated sewage effluent back into the casthouse to reduce fresh water demand. Excess treated sewage effluent is discharged to a watercourse that is

used for informal crop watering. Compliance with discharge quality limits, particularly disinfection, should ensure the reuse of treated sewage effluent is acceptable, and is beneficial to communities.

Mozal has an established on-site groundwater quality monitoring programme. In respect of the groundwater monitoring data provided by Mozal, the limit water quality column against which the on-going analyses are compared, is taken to be the groundwater compliance limits prescribed by the original EMP. It is accepted that these limits are not drinking water quality limits, but are limits reflecting a saline groundwater regime, commensurate with the site being located within the zone of influence of the marine/estuary environment. Regular groundwater analysis has been taken back to 2002. The data indicate a general compliance with the limit values, and there is no statistical trend of deterioration.

5.4 EHS Guidelines

5.4.1 Air quality

The 2007 World Bank/IFC EHS Guidelines were reviewed and compared against the emission and ambient guidelines that have been adopted in the AEMP. The ambient guideline limits for PM_{10}, $PM_{2.5}$, SO_2 and NO_2 that have adopted in the AEMP are consistent with the 2007 World Bank/IFC EHS Guidelines for these parameters. With respect to the emission guidelines, the 2007 World Bank/IFC EHS Guidelines for Smelting & Refining provides guidance on managing air emissions from aluminium plants. The EHS Guidelines for Smelting and Refining are not prescriptive in terms of emission concentrations. Instead, different types of air emission abatement technologies are prescribed and the efficiencies of the various technologies are given as a guideline for the different parameters for the aluminium production process based on GIIP. The emissions guidelines that were adopted in the AEMP are compared against the 2007 WBG EHS Guidelines in Table 5-1. Based on the comparison presented in Table 5-1, Mozal should consider reviewing its emission guidelines and updating them as necessary. Since the WBG limit is a guideline, Mozal will have to consider site-specific risks to the environment in determining whether the lower emission guidelines will need to be adopted where applicable. In the case of SO_2, Mozal will need to consider adopting an emission limit as it does not have one at the moment. The SO_2 emission limit is especially relevant given the exceedances of ambient 24-hour guideline concentrations when ambient monitoring has been conducted in the past.

Table 5-1: Comparison between the 2007 WBG EHS Guidelines (for Base Metal Smelting and Refining) and the AEMP guideline limits

Parameter	2007 WBG EHS Guidelines	AEMP Guideline Limit
SO_2	<50 – 200 mg/Nm^3	None adopted
NO_2	100 – 300 mg/Nm^3	None adopted
Dust	1-5 mg/Nm^3	30 mg/ mg/Nm^3
HF	0.5 mg/Nm^3	1 mg/Nm^3
Total Fluoride	0.8 mg/Nm^3	2 mg/Nm^3
Volatile Organic Compounds	5-50[7] mg/Nm^3	20 mg/Nm^3

[7] *Refers to an emission guideline for Total Organic Carbon as there is no standard for Volatile Organic Carbon*

5.4.2 Water and waste

The following section summarises salient points in respect to the auditors' observations of Mozal's water and waste management practices and impact monitoring.

Environmental performance in respect to water and waste management is considered to be generally compliant with the Mozal EMP and License conditions, the principles of measures included in the IFC EHS Guidelines, and the Water Management and Waste Management Plans that Mozal has drafted, and regularly reviews and updates, to guide its activities.

Clean and dirty water is segregated on-site and affected wastewater is contained in a detention/attenuation dam system prior to blending with clean blow-down water or river water for controlled discharge in accordance with monitored quality specifications. The use of river water to dilute the wastewater to enable discharge quality to be within specification is authorised.

The Mozal sewage works was engineered to more stringent standards than Mozambique or World Bank requirements at the time, and current analysis data demonstrates that is performing to the general principles of discharge of treated effluent to the receiving environment. Mozal is also implementing measures to recover the treated effluent into the plant operations to reduce fresh water demand.

Mozal has implemented a programme of on-site waste segregation, with dedicated waste bins and skips for separated wastes located at waste generation locations throughout the facility. Waste segregation assists to maximise the ability to recover and recycle wastes for on-site, and mainly off-site re-use, and to minimise the non-hazardous waste disposal to the Matola landfill and for hazardous waste volumes and types disposed to the Mavoco hazardous waste landfill. The Mavoco landfill, designed and constructed for Mozal, is the only competent hazardous waste facility able to receive such waste in Mozambique.

Waste collection and off-site recycling of non-hazardous and off-site disposal and recycling of hazardous wastes are contracted out.

The Matola landfill is recognised to have operational and maintenance challenges as a Municipal operated landfill. The Mavoco hazardous waste landfill was designed and constructed to South African design norms for a hazardous waste disposal facility. This has always been operated and maintained by an authorized external service provider on behalf of the Mozambique Environmental Authorities. Hazardous waste that cannot be received by the local landfill, or has opportunity for reuse, is exported to South Africa, under a certification of the Basel Convention, by the external waste service provider. It is assumed that the waste service provider is operating within the environmental and waste management laws of Mozambique and South Africa, and the service contracts can be appropriately worded by Mozal to ensure such, supported by external audits of waste handling, recycling and disposal operations and documentation.

The wastewater and waste management infrastructure and services, as authorised by the EIA and License conditions, were designed and constructed in accordance with the principles of GIIP, taking into consideration safety risks to third parties or affected communities, at the time. Mozal has raised concerns with the authority in respect to observed concerns over the operation and management of the Matola landfill, but there appears to be inadequate capacity within the local authority to address the operational challenges of the landfill, and to prevent informal scavenging of waste from the landfill. However, as the Mozal contribution of non-hazardous waste is limited, and Mozal disposes its waste in accordance with landfill authorisation conditions, the risk to Mozal should be limited.

Mozal has established internal targets for improved water conservation and waste management which are reported and considered in monthly internal management reporting. Mozal also compiles

an annual report on its environmental performance, including its water monitoring and waste generation records, and provides bi-annual presentation of findings to the invited stakeholder group.

Mozal considers that its water and waste management practices are in accordance with accepted practices of the BHP Billiton Group, and international practices for aluminium smelters. The reported data supports the contention, and that Mozal indicates that there has been no specific pressure from the Mozambican authorities or NGOs to change the current water and waste management techniques and practices. Mozal had apparently not been advised of an NGO water quality complaint around 2010, or provided data for comment and consideration/response.

6 Recommended focus areas

This section outlines the recommended focus areas for Mozal to consider for improving its EMS.

6.1 Environmental management system

6.1.1 A focus on environmental outcomes and not procedures

Considerable effort is expended by Mozal in complying with internal BHP Billiton Group requirements and procedures, which is commendable. However, this is perceived to result in insufficient effort given to the analysis and interpretation of trends in performance data which should influence the improvement and adaptation of management practices more directly.

6.1.2 Commitment to application of prevailing good practice

The overall management system documentation, notably policy documentation and the EMS ALD does not refer to prevailing or current international standards and the application of GIIP. These documents should be reviewed to specifically reference and mention a commitment to applying current GIIP to align them with performance requirements in management plans.

Water use, wastewater management and solid waste management at Mozal appear to be undertaken in accordance with the intent of the EIA and licence conditions. The management plans have been drafted in response to the environmental impacts, water impacts and waste impacts identified at the time of the EIA, and in cognisance of the lenders' requirements at the time, specifically the WBG EHS Guidelines.

Mozal has also established internal performance standards, or scorecards, by which individual business unit practices and performance can be targeted, ranked and reported, and the HSEC department assists with internal auditing of business unit performance.

Monitoring is primarily based on comparison with quality limits as prescribed by the licence conditions, rather than assessment of the practical impact of the water and waste management practices on the receiving environment and human health, which could be provided for.

As there is limited evidence of detrimental impact from Mozal's water and waste management, it may be possible to review the EIA that informed the EMP before Mozal was designed and developed, and review the Environmental Risks, with a view the relaxing or amending the Licence conditions based on practical scientific evidence and experience, rather than limited scientific information and assumptions at the time of the original EIA.

6.1.3 Roles and responsibilities

Management resources, responsibilities and procedures are well documented. Mozal has developed comprehensive task directives through the 1SAP system, identifying the task components and responsible person for each task component. There are opportunities to improve the specifics of the task instructions and guidance to ensure that the tasks and reporting requirements are effectively understood when other personnel may take over the present roles and responsibilities. Standard Operation Procedures (SOPs)[8] should be SMART (Specific, Measurable, Agreed, Relevant and Timebound) to enable consistent interpretation and implementation of rectification actions, and effective subsequent auditing and reporting.

[8] *Referred to as Best Operating Practices (BOPs) at Mozal*

Environmental management has been transferred from a dedicated HSEC responsibility to a business unit responsibility. Although roles and responsibilities are described in Management Plans, these could be more clearly defined, and SMART, so that there is no ambiguity or misunderstanding when other personnel may take over the present roles and responsibilities. Mozal has indicated that its personnel structure is guided by the BHP Billiton Operating model, and that integration is an important part of the function.

6.1.4 Independent assurance and data checking

Air quality

Mozal provides for regular internal and external (BHP Group and ISO audits) auditing of internal air quality management practices. Performance is measured against its Best Operational Practices documents. In all cases stack emission sampling and ambient air quality monitoring follow internationally acceptable good practice for both internal and independent third party monitoring. However this will have to be further verified for each of the monitoring activities.

Mozal should review within the HSEC team who is responsible for the integration of the data collection process from emissions monitoring at source to ambient air quality monitoring. This recommendation also applies to water monitoring procedures. Furthermore, the review should include the responsibility for the assessment of the data i.e. trends and relating them to events that are occurring at the plant in order to determine whether emissions from the Mozal facility are having or are likely to have an impact on ambient air quality and identify corrective measures if problems are identified.

Water and waste management

Mozal provides for the internal (HSEC unit) auditing of individual business unit water use and waste management practices, and undertakes auditing of external waste service providers and waste disposal facilities. The HSEC audits provide feedback to internal business units and waste service providers on the findings to encourage compliance to internal targets as well as the EMP and License conditions, and for improvements, where appropriate. It is noted that the Matola municipal non-hazardous landfill is poorly operated, and Mozal has indicated that its findings have been communicated to the Municipality.

Ownership/responsibility for the Mavoco hazardous waste landfill and the Matola non-hazardous waste disposal landfill is the Mozambique Authorities. Mozal indicates that as the landfills are operated under independent contract and that although it may audit and communicate findings, it is not at liberty to require the findings to be rectified. Similarly, Mozal indicates that as the waste recycling and disposal is contracted out, Mozal has had some difficulties in arranging audits and verifying the performance status of the recycling and disposal of its hazardous wastes at facilities in South Africa.

As noted previously, regular groundwater analysis has been undertaken for the Mozal site monitoring boreholes dating back to 2002. The data indicate a general compliance with the limit values, and there is no statistical trend of on-going deterioration.

There are limited on-site analytical capacities, other than for basic analysis parameters and F in water samples, and detailed analysis has historically been undertaken by external laboratories, with sampling undertaken by Mozal personnel, according the established Standard Operating Procedures (SOP's). Mozal indicates that external sampling and analytical services have recently been identified within Mozambique (Swiss Lab) to whom a service contract is to be awarded.

Since Mozal has implemented the water monitoring programmes required under the EMP and License conditions for more than 10 years, it should be possible to review the extent and applicability

of the current monitoring programme against the trends and impacts that have been identified, and subsequently to rationalise the monitoring programmes to be more appropriate and practical to current, and future environmental impact monitoring.

6.1.5 Stakeholder engagement and disclosure

While there has been an elevation of the importance of stakeholder engagement within Mozal since 2010, and while there are numerous mechanisms for engagement and solid community development work, there appears to be some concern around written disclosure of management plans, results of performance assessments and audits, and performance data. It is understood that monitoring data are not distributed in writing to avoid data being taken out of context. While bi-annual Interested Parties meetings do serve as a useful feedback mechanism, further effort to identify tailored methods of engagement should be explored. Additionally, an external grievance procedure should be considered using international guidance, and engagement activities tailored to the interests and salience of stakeholder groups based on a structured stakeholder mapping and analysis exercise.

6.2 Air quality management

The discussion with Mr Sean O' Beirne supports the assertion that Mozal has the systems and guidelines in place to manage its environmental impacts. However, SRK noted that the process of collecting, processing, interpreting data and closing out findings appear to be lacking in continuity as there is no single team or person who is involved throughout this process from data collection to interpretation. As an example, one team is responsible for collecting stack emission information, another captures the data and another reviews the data. This results in the different teams following the protocol but there is no pause for individual teams to interrogate the data collection process and the protocol in order to ensure the data are representative of site conditions at the time of measurement. In further support of this observation, the increasing trend in total fluoride emissions does not seem to have been given the necessary attention.

Another example would be the slow pace of installing air monitoring station at the MCDT site. Installation and commissioning of the monitoring station at the MCDT site can be undertaken within a week at best and less than a month at worst. However the delays as a result of the move means that there is currently no continuous ambient air quality monitoring being undertaken in the vicinity the Mozal facility. The need to have an operational ambient air quality monitoring station must be treated as an urgent matter especially given that by-pass conditions occur on a weekly basis at the FTC. Since SRK's site visit, Mozal has indicated that the monitoring station will be operational from April 2014. There was also no evidence to suggest that the data obtained from the external monitoring conducted by SGS are being integrated back into the operations to ensure that contributions from the Mozal facility are minimised, especially for PM and SO_2.

With respect to stack emission monitoring Mozal should review and consider stack emission monitoring at the FTC stacks on a continuous basis and if that is not possible then monitoring during the weekly by-pass events should be conducted, especially for PM and $SO_{2,}$ due to the increase in ambient concentrations that were observed during the 2013 stack pass monitoring campaign. While Mozal has indicated stack emissions are currently determined through chemical mass balance methods and supplemented by *ad hoc* monitoring, e.g. the extended stack by-pass period from February to May 2013, continuous monitoring will improve the accuracy of the data and assessment of any impacts that may be due emissions from the FTC stack emissions.

6.3 Water and waste management

The existing Water Management and Waste Management Plans of Mozal provide a sound basis for the monitoring of water use, wastewater discharge and waste generation and disposal against EMP and Licence conditions.

Mozal should continue to review, and update, the water and waste management practices in accordance with findings of internal audits and interpretation of the trends in waste generation, water use, wastewater quality and receiving water and ecological quality, and opportunities for improvement informed by regular review of local and international practices.

As much of the hazardous waste is currently transported to South Africa for recycling and disposal, and the South African waste characterization and reporting regulations were changed in 2013, it is recommended that Mozal review its waste streams classification and characterizations.

As some concerns have been identified within the Mozal HSEC audits of the Mavoco and Matola landfills, and disposal of hazardous wastes for recycling or disposal in South Africa is an expensive and challenging programme, it is recommended that Mozal review the opportunity to establish on-site waste disposal facilities, as an alternative.

Mozal should continue to review the operational practices and performance of its wastewater and solid waste service providers, and the contractual conditions between Mozal and service providers, to ensure they do not put Mozal at reputational or litigation risk.

Mozal should continue to review the groundwater impacts, and soil contamination, in respect of the practical risks that such impact may pose currently, or in future, to ensure that mitigation measures can be developed, if required, and that Mozal is not put at reputational or litigation risk.

Mozal should continue to review the surface water impact in respect of the practical risks that such impact may pose currently, or in future, to ensure that mitigation measures can be developed, if required, and that Mozal is not put at reputational or litigation risk.

7 Conclusions

The following conclusions are based on the findings of this audit.

7.1 Environmental management system

Mozal's EMS is generally well structured and documented, and there is a strong emphasis on procedural rigour. Stakeholder engagement has been reviewed at a high-level, and it appears that its importance within Mozal has been elevated since 2010.

As with any management system areas for improvement do exist and so both cross-cutting and issue-specific recommendations have been made for improving the EMS, including the stakeholder engagement approach and activities.

7.2 Air quality

- There was no evidence to suggest that significant impacts on ambient air quality had occurred as a result of short periods of exceedances of ambient air quality guidelines for PM_{10} and $PM_{2.5}$, SO_2 and HF during stack by-pass events.
- During normal operating conditions ambient concentrations for $PM_{10,}$ $PM_{2.5}$, HF, SO_2, NO_2, BAP and dust deposition are generally below their respective ambient guideline limits listed in the Air Emissions Management Plan. However, some exceedances of SO_2, PM_{10}, $PM_{2.5}$ and BAP standards listed in the Air Emissions Management Plan were observed during the *ad-hoc* third party ambient air quality monitoring campaigns during the February to May 2013 extended stack by-pass event. For PM_{10}, $PM_{2.5}$ and SO_2 exceedances of the respective Mozal standards were observed on more than one occasion. While the number of exceedances recorded exceeded the permissible number of allowable annual exceedances this was abnormal due to the extended by-pass event. Furthermore, it is possible that the frequency of these exceedances could exceed the permissible allowable number of exceedances per year with the weekly FTC by-pass events becoming a part of normal operations. It should be noted that because ambient monitoring is currently conducted on an *ad-hoc* basis or during specific events, the frequency of exceedances on an annual basis cannot be determined. The planned continuous ambient monitoring for PM_{10}, $PM_{2.5}$ and SO_2 will allow Mozal to identify its contribution to the exceedances, both during non-by-pass and by-pass events, and the potential number of exceedances on an annual basis.
- The increasing trend in total fluoride emissions is a concern and Mozal has implemented several initiatives towards reversing this trend. These include the efforts made to reduce anode effects by removing the fines from the incoming alumina streams, improving anode covering, as well as a progressive replacement of the pot hoods to ensure that fugitive emissions into the pot rooms are effectively controlled. Mozal has indicated that instability in its power supply has also been a factor contributing to the increase experienced in total fluoride.
- Ambient SO_2 and PM concentrations exceeded the WHO guideline adopted in AEMP during the extended stack by-pass event from 28 February to 1 May 2013 on a number of occasions.
- With respect to air quality, Mozal generally has the people, systems, protocols and budgets in place to comply with its commitments towards managing air quality impacts. However the lack of continuity in the various steps that are undertaken from sample collection to data interpretation may result a loss in data quality and effective use of the data to identify possible problems and reaction to problematic data trends. Furthermore, staff members at the sample collection and data processing stages need to interrogate the procedures/protocols being followed and interpret the data that they are working with to ensure that good quality and reliable data are produced to support management decisions.

7.3 Water and waste management

- The Mozal Water Management Plan and Waste Management Plan promote preventive measures consistent with GIIP, such as the WBG EHS Guidelines, identify risks and impacts and provide mitigation measures which favour the avoidance of risks and impacts over minimization.
- The wastewater and waste management infrastructure and services have been designed and constructed in accordance with the principles of GIIP, taking into consideration safety risks to third parties or Affected Communities.
- The existing water and waste management infrastructure has been established to meet the requirements of the ESIA and licence conditions.
- The ESIA was authorised and the licences issued, and Mozal indicates that subsequent performance monitoring has not elicited complaints from authorities or communities. Mozal had not been advised of the water quality concern that has been communicated to the EIB, has not been provided with the data on which the concern was apparently based, and has not been requested to respond to the concern.
- Wastewater and treated sewage discharges do affect receiving watercourses, but as the discharge qualities are generally compliant to the categorical limits within the Licence for discharge, Mozal does not currently appear to be required to quantify the practical impact of its discharges on the receiving water courses and downstream users, or to undertake remedial action, other than dilution to meet the wastewater discharge quality limits, and on-going water quality monitoring.
- The existing water and waste management infrastructure provide a sound basis for the management of Mozal's wastewater and treated sewage discharge and waste handling and disposal against license conditions.

7.4 Recommendations on the way forward for EIB

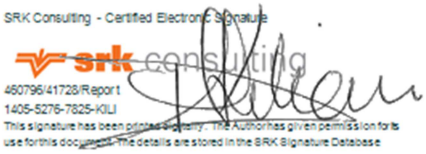
SRK believes that the investigation of this complaint has been comprehensively undertaken by the EIB-CM. Consequently, it is not evident that additional studies are required to close-out the complaint; particularly as the EIB's direct financial interest in Mozal has been repaid.

Prepared by

DJD GIBSON *MSc PrSciNat MInstD*

Partner

Reviewed by



pp JA COWAN *BScHons GDE PrSciNat*

Project Reviewer

All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

Appendices

Appendix A: List of Documentation Reviewed

GENERAL ENVIRONMENTAL

- Environmental Management Plan for Operations of Smelter Harbour Facilities ALD100027
- Mozal Phase 2 EA Executive Summary for IFC
- HSEC Risk Register FRM000366
- BHP Billiton Environment GLD 009
- BHP Billiton Health, Safety, Environment and Community Reporting GLD 012
- Environmental License Certificate April 2011
- Contractor Management Plan ALD100041

AUDIT DOCUMENTATION

- Mozal Annual Monitoring Report (AMR) 2011-12
- Mozal Annual Monitoring Report (AMR) 2012-13
- Mozal Interim Issues Log 21st June 2013
- Quality and Environmental Internal Audit T&L Department (as example of internal audit reporting)
- Mozal HSEC Management System Review and Internal Audit Procedure ALD.MOZ 197

AIR QUALITY

- Mozal Emissions Management Plan ALD 100017
- The fume treatment centre (FTC) rebuild at Mozal Environmental Close-out report, SE Solutions (Pty) Ltd, October 2011
- Ambient air monitoring during FTC maintenance – February to May 2013 Testing Report, July 2013

WATER AND WASTE

- Waste Management at Mozal (Mozal Waste Management Plan) ALD000104
- Water Management Plan ALD100018

COMMUNITY AND STAKEHOLDER ENGAGEMENT

- Interested Parties Meeting presentations HSEC 29th October 2013
- Mozal Community Development Plan ALD 100031
- Mozal Stakeholder Engagement ALD 100015
- Mozal Health, Safety, Environment and Community Reporting Plan ALD 100022

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