European Investment Bank

Complaints Mechanism

MOZAL Project

Maputo, Mozambique

Complaint SG/E/2010/16

CONCLUSIONS REPORT

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Prepared by

Complaints Mechanism:

Esther de Kruijff
Roberto Rando

External Consultants:

LECES

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Felismino Alcarpe

Head of Division
Complaints Mechanism

External Distribution
Complainants: coalition of Mozambican NGOs (Justiça Ambiental, Livaningo, Liga Moçambicana dos Direitos Humanos, Centro Terra Viva, Kulima and Centro de Integridade Pública)
Project Promoter: Mozal
Mozambican authorities: MICOA
EU co-financiers: PROPARCO, DEG
Accountability Mechanisms: IFC-CAO, OECD UK NCP

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

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 whereby 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).

If complainants are unhappy with the reply they may on a pure voluntary basis, within 15 days of the receipts of the EIB-CM's reply, submit a confirmatory complaint. Furthermore the complainants who are not satisfied with the outcome of the procedure before the EIB-EIB-CM and who do not wish to make a confirmatory complaint may also 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 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.

The EIB Complaints Mechanism intends to not only address non-compliance by the EIB to 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-EIB-CM would like to thank all people and organisations with whom they have interacted during the investigation of this complaint, in particular it wishes to express gratitude to those that have made themselves available during our missions, such as the complainants and the project promoter. The EIB-EIB-CM expresses its appreciation to the EIB staff, in particular those that assisted in the field missions and thanks the experts from LECES, for providing valuable specialist information.

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

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EXECUTIVE SUMMARY

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

<u>The bypass</u>

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 seemsed 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.

<u>The EIB Statement of Environmental and Social Principles and Standards</u>

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.

CONCLUSIONS REPORT

PART I

Complainant: coalition of Mozambican NGOs (Justiça Ambiental, Livaningo, Liga Moçambicana dos Direitos Humanos, Centro Terra Viva, Kulima and Centro de Integridade Pública)

Subject of complaint: The complainants raised concerns regarding the environmental impacts caused by MOZAL operating it's Fume Treatment Centres (FTCs) in "bypass mode" during 6 months and alleged that Mozal was acting in such way putting the EIB financed project in breach of the EIB Statement of Environmental and Social Principles and Standards

1. COMPLAINT

1.1. 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) (hereinafter the "complainants" or the "coalition") lodged a complaint with the EIB by using the Complaints Form.

1.2. The complaint was filed with a series of independent accountability mechanisms of financial Institutions including the Office of the Compliance Advisor Ombudsman (CAO) for IFC & MIGA as well as with the OECD UK National Contact Point.

1.3. On 11 November 2010 the EIB Secretary General acknowledged receipt of the complaint, and informed the complainant of the fact that a review of his case had been launched as well as of the date by which they might have expected to receive an official reply from the EIB.

1.4. On 10 December 2010 the EIB Complaints Mechanism Division (EIB-CM) informed the complainants and the project promoter of its intention to conduct an on-site assessment from 13 to 17 December 2010 in co-operation with the CAO, which was also performing an initial assessment on its case. The objectives of the on-site visit of the EIB-CM were:

(i) to better understand the complainants' allegations, the project promoter and the environmental authorities' position, and the situation on the ground; and
(ii) to determine if further work would be necessary and/or possible from EIB side (investigation, compliance review or mediation between the parties).

1.5. Based on the outcome of the on-site assessment it was agreed that the CAO would pursue its mediation process, while the EIB-CM would conduct a compliance review.

1.6. 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.

2. ALLEGATIONS

2.1. The allegations brought by the complainants (for full complaint see Annex 1) concerned the alleged breach by Mozal of the EIB Statement of Environmental and Social Principles and Standards. In particular they argued that 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 that could have an adverse effect on the environment and the health of the people.

2.2. The complainants challenged the Ministry of Coordination of Environmental Action (MICOA) who issued a special authorisation conditional on the presentation of an Environmental Management Plan (EMP) and a Contingency Plan and required Mozal to review their Social Responsibility Policy.

2.3. The complainants alleged lack of information from Mozal despite various attempts to obtain documents and data related to the bypass. Moreover the complainants had requested access to annual reports regarding Mozal's environmental performance but alleged that such access had been refused. Furthermore, the complainants stated that communication by Mozal with civil society, and in particular with the complainants, had been strikingly unsatisfactory, slow, inconsistent and contradictory.

3. CLAIM

3.1 Actions requested by the complainants:

- The conduct of an independent environmental audit based on scientific verifiable data and methodology and transparent considerations taking the requirements of Chapter V of the OECD Guidelines for Multinational Enterprises into account;
- Access to all Mozal's annual reports regarding environmental performance and their initial environmental permit;
- A detailed and comprehensive list of all other prior short-term bypass procedures undertaken by Mozal to date;
- Argued evaluation of alternatives of a bypass operation during the rehabilitation process;
- Public presentation of the environmental audit and effective consultation of civil society and affected population

3.2 According to the complainants, the objective of bringing this claim was to bring the allegedly intolerable conduct of BHP Billiton's subsidiary to the attention of the EIB. The coalition was confident that the EIB will consider Mozal's action and inaction in fair and transparent manner and was optimistic that it would conclude Mozal to be in breach of its Statement of Environmental and Social Principles and Standards. The coalition hoped that the EIB by putting pressure on Mozal, would encourage the company to give consideration to the coalitions requests and engage in rational conciliation with civil society and the affected population.

4. SCOPE LIMITATION OF THE EIB COMPLAINTS MECHANISM

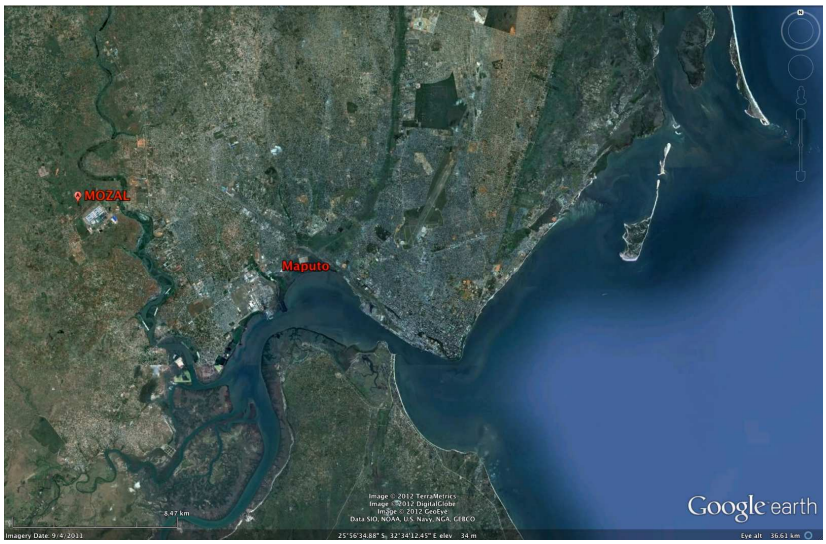
4.1 According to the EIB Complaints Mechanism, Principles, Terms of Reference and Rules of Procedure (CMPTR) IV, Art. 2.3, the EIB-CM is not competent to investigate complaints concerning International organisations, Community institutions and bodies, national, regional or local authorities (e.g. government departments, state agencies and local councils). Consequently the EIB-CM declares its incompetence to deal with the second allegation under paragraph 2.2 above regarding the role of MICOA.

5. THE PROJECT

5.1. 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.

5.2. The first EIB financing to the project (MOZAL ALUMINIUM SMELTER), was a EUR 38m loan to Mozal and a EUR 19m to the Republic of Mozambique for a minority equity participation (from risk capital resources). It was approved by the EIB Board on 30.09.1997 and concerned the construction and the operation of an aluminium smelter on a greenfield site. The plant is based on imported alumina and produces commodity aluminium ingots for export. The smelter is located is Beluluane, some 17 km from Maputo, on the 138 ha site of the existing smelter. Road access to the existing dedicated maritime terminal in Matola harbour (near Maputo) already existed.

5.3.



5.4. 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.

5.5. The project includes a necessary anode plant (carbon anodes are an important part of the electrolysis process) and a cast house (of a simplified type, for the smelting of commodity type ingots). The project also takes into account the necessary additional infrastructure: discharging and stockpiling facilities for alumina on a modified quay, routes and housing facilities. The draught of the harbour permits the reception of 35 000 DWT vessels, which is acceptable for alumina shipments.

5.6. A second operation (MOZAL II) was approved by the EIB Board on 05.11.2001. This operation consisted of EUR 20m for a Government minority equity participation (3.8%) in the project extension, with amongst others IFC, DEG and Proparco as co-financiers.

5.7. It concerned the construction and operation of an extension of capacity in the existing Mozal aluminium smelter. The capacity of the extension will be 250 Kt of aluminium commodity ingots per year. The investment project comprised the following elements:

- a new potline (288 cells and their gas treatment centres) and the doubling of capacity of the existing cast house,
- an expansion of the carbon plant (a new paste plant and bake furnace and expansion of anode handling facilities),
- at the harbour, a new unloader, an alumina silo and a liquid pitch storage facility,
- electrical facilities (a new power transformer and auxiliaries).

5.8. Enlargement of service facilities and utilities (water, compressed air and various storages) had not been necessary, as these were already designed for the extended capacity.

5.9. The design of the new potline was identical to the existing one and benefited from a Technology Transfer and Technical Assistance Agreement with an EU company, which also provided a guarantee on its know-how and therefore on the plant performance. New technologies in the aluminium industry - under development - may reduce capital and operating costs of future new plants, but should not be a threat to Mozal II as they are unlikely to be in operation for at least 6 years and Mozal's low cost base indicates that the plant will remain competitive in the long term. The plant design allowed for a slight production increase (over the nominal capacity).

5.10. The project required the installation of a third electricity line from the Maputo substation to the smelter (3 km) and an additional power transformer. The Matola port handles all shipments for imports of raw materials and exports of aluminium ingots for both lines. This requires 24-hour operation, improved general facilities and management to handle the additional cargo without risk for the entire operation. The existing road infrastructure can accommodate the doubling in traffic between the port and the smelter. Any improvements translate into additional investments, which benefit the community and business development.


Source: The Fume Treatment Centre (FTC) Rebuild from the Mozal Environmental Close-Out Report

6. THE LEGAL ARRANGEMENTS

6.1 The Mozal project benefited from three EIB loans totalling approximately 77 million euros. The project was financed through equity (share capital and shareholder loans), quasi-equity (subordinated secured loans) and through Loans (senior secured loans). The project was co-financed by, among others, the International Finance Corporation (IFC), Commonwealth Development Corporation (CDC), Development Bank of Southern Africa (DBSA), Deutsche Investitions und Entwicklungsgesellschaft mbH (DEG) and Société de Promotion et de Participation pour la Coopération Économique S.A. (Proparco).

6.2 A first Finance Contract between the EIB and the Republic of Mozambique was signed on 22 June 1998 for an amount of 19 million euros to be used exclusively to finance the subscription of a minority participation in the share capital of Mozal Limited which is to engage in a project to construct and operate an aluminium smelting plant at Maputo in the Republic of Mozambique.

6.3 A second loan was signed between the EIB and Mozal was signed on 13 July 1998 for an amount of approximately 38 million euros. Mozal proposed to undertake a project comprising the construction and the operation of an aluminium smelter, with a capacity of 250 kt of aluminium ingots per year.

6.4 A third loan was signed in December 2001. This loan by the EIB to the Republic of Mozambique for an amount of amount of up to 20 million euros to be used exclusively to finance equity participation in the second phase of the Mozal smelter, which will double the smelting capacity at the Mozal plant.

6.5 The three legal agreements set the framework for MOZAL obligations regarding project information to be provided to the EIB on a routine basis and on request by the later.

7. THE BYPASS

7.1. Due to severe structural damage as a result of unanticipated corrosion Mozal was 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 directly into the atmosphere via the existing stacks. Moreover atmospheric emissions from the entire smelter could result in potential increases in ambient concentrations of certain key pollutants compared to normal operations; specifically hydrogen fluoride, particulate matter and tars.

7.2. According to Mozal, an assessment was conducted prior to the bypass in order to anticipate changes in emissions together with predicted ambient concentrations of the three pollutants in question and concluded that at the time of the assessment that the bypass would not result in significant health risks for people that could be affected by the increased emissions.

7.3. As part of that assessment, Mozal developed a management plan to ensure that the actual ambient concentrations did not differ significantly from what had been predicted and that they would not approach or exceed the health based limits that had underpinned the assessment.

7.4. The management plan contained the following management and mitigation actions:

- Completing the rebuilding process quickly and effectively;
- High level performance of all remaining abatement equipment;
- Effective monitoring regime;
- Effective consultation and disclosure;
- Improved engagement with environmental NGOs;
- Emergency preparedness and response:
- Setting of objectives together with performance indicators and targets.

7.5. On 26.05.2010 the Ministry of Environment (MICOA) issued the Special Authorisation which allowed Mozal to go ahead with their planned bypass.

7.6. According to the Mozal FY2011 Environmental and Social Performance Annual Monitoring Report (AMR): “The major event in the reporting year was undoubtedly the rebuilding and upgrading of the FTC’s (Fume Treatment Centres). This event was prefaced by considerable resistance from environmental NGOs which was highly publicised and reported on extensively in the media. The FTC rebuilding was even debated in Parliament. As much as the FTC rebuilding resulted in initial negative publicity the rebuild project itself was highly successful. The project was concluded within the 137 days promised and more importantly an extensive ambient air quality monitoring campaign confirmed that atmospheric emissions during the bypass had not resulted in any increased risk to human health or the environment. The FTC rebuilding saw a strengthening of the relationship with government and the environmental ministry in particular.”

8. BANK'S DUE DILIGENCE REGARDING THE BYPASS

8.1. In accordance with the financial agreement condition Mozal provided the EIB with monthly, quarterly and annual reports. These documents were filed in the EIB electronic document management system.

8.2. On 16.11.2010, Mozal wrote to some of the co-financiers, DEG and PROPARCO, but excluding the EIB, referring to another letter of 21.09.2010 to confirm that the work to repair and upgrade the fume treatment centres (FTCs) commenced on 01.11.2010 as planned. The EIB never received the letter of 21.09.2010 and only received a copy of the letter of 16.11.2010 that same day and after already having received a copy of the complaint.

8.3. It is clear that the EIB had been informed about the bypass only after the fact, i.e. 2 weeks after the actual start of the bypass. In this context, it was decided between the 3 institutions (DEG, PROPARCO and EIB) to collaborate closely with the EIB-CM in its assessment and investigation of the complaint and to ensure a common and consistent position.

8.4. The EU co-financiers were informed and provided with all the documentation collected by the EIB-CM as well as the Initial Assessment Report. Discussions and debriefing conference calls were held between the EIB-CM, EIB operational services and the other EU co-financiers, throughout the EIB-CM work. The EIB operational services also participated in some of the EIB-CM field work in Mozambique.

8.5. The IFC had been informed by Mozal about the bypass in due time. Upon this information, IFC had visited the site and had met with MOZAL and exchanged communications, including the letter that MOZAL had sent to lenders with the list of measures to put in place. However, it appears that IFC did not inform the EU co-financiers, and has had difficulties to share all the relevant documentation. Later, an IFC team was in Mozambique at the time of the EIB-CM Initial Assessment site visit.

8.6. ***The cooperation of EIB operational services with the EIB-CM throughout all the phases of the complaints handling process has been outstanding. The positive outcome of EIB-CM involvement in the by-pass process and its follow-up would not have been possible without such support.***

9. THE EIB-CM INITIAL ASSESSMENT

9.1. The EIB-CM launched a review of the case. As part of this review, it visited Mozambique from 13 to 17 December 2010, for an on-site assessment. This visit coincided with the CAO, who were performing an initial assessment on its case. The objectives of the on-site visit of the EIB Complaints Mechanism were:

- to better understand the complainants' allegations, the project promoter and the environmental authorities' position, and the situation on the ground; and
- to determine if further work would be necessary and/or possible from the EIB side (investigation, compliance review or mediation between the parties).

9.2. **List of meetings and visits:**

- Meetings with representatives of the NGOs of the coalition complaining about the Project: i) An initial meeting for the NGOs to have the opportunity to thoroughly explain the substance of their allegations; ii) A second meeting to further clarify issues discussed during the previous meeting and to provide additional documentation which had not been attached to the original complaint; iii) A final wrap-up meeting to discuss the outcome of the visit and possible ways forward.

- Meetings with the EC Delegation to Mozambique - Informative meeting regarding the subject of the complaint as well as of the objectives of the mission; Wrap-up meeting with the EU Ambassador to present the outcome of the visit and possible ways forward.

- Meetings with stakeholders identified and proposed by Mozal - ECL and KEMPE (sub-contractors for maintenance), and several meetings with SE Solutions (responsible for the independent assessment of bypass environmental impacts).

- Meetings with Mozal i) An initial meeting with the CEO, Mr. Mike Fraser and Mozal management team. Mozal provided information about the chronology of measures taken by Mozal to establish an open and transparent dialogue with civil society; in addition Mozal elaborated on the rationale behind the decision to produce under by-pass, on the authorisation process relating to the operation of the aluminium smelter as well as on the monitoring of atmospheric emissions carried out to date; ii) A meeting with Mozal technical management to discuss in detail the substance of the complaint with regard to the environmental and performances of Mozal; iii) A partial visit of the smelter facility (in particular, the furnaces); iv) An informal wrap-up meeting with Mr. Mike Fraser on the results of the preliminary assessment and the further actions with regard to the complaint at stake.

- Meeting with Ministry of Environment (MICOA), the Deputy-Minister of Environment of the Republic of Mozambique and a delegation of experts (the Director of the EIA Department, Dr Cumbana, a University Expert which had carried out an analysis on behalf of MICOA and a lawyer). MICOA presented actions taken by them and in general by the Government of the Republic of Mozambique with regard to the environmental authorisations granted to the Project under complaint.

9.3. **Results of the EIB-CM Initial Assessment**

9.3.1. The urgency (the bypass was under way) and potential seriousness (due to air pollution levels) of the event were well understood and required quick action.

9.3.2. From the initial assessment, it stemmed that some further EIB-CM involvement would be helpful to achieve a better and common understanding and improve the degree of trust between the parties, regarding the bypass process. Such EIB-CM involvement aimed at ensuring:

(i) proper information flows and engagement with relevant stakeholders (including project affected people) and
(ii) proper monitoring of emissions to the environment and compliance with well defined and credible standards/limits.

Stakeholder's information and engagement

9.3.3. It could be argued that pressure exercised by the complainants was instrumental to the progress recorded during this on-site visit. Moreover, both Mozal and the Coalition saw the meeting held on 15 December 2010 as positive step towards better communication and in addressing the concerns expressed by the complainants.

9.3.4. In order to be able to express the respective opinions in an open and transparent dialogue between Mozal and civil society, it was of paramount importance that both parties conceive the meeting initially planned for January 2011 as a precious opportunity to shift from an emotional mode of voicing serious concerns to constructive criticism aimed at maximising the success of the stakeholders' engagement process for Mozal, the civil society concerned by the by-pass operation, and in general, the Republic of Mozambique. Under these circumstances, the EIB-CM considered of primary importance that all the complainants were provided with all information requested with a view to nurturing the feeling of ownership of the monitoring process among the members of the Coalition. Ideally, the 2nd stakeholders' engagement meeting that would take place early February 2011, at the latest, would aim at:

- Identifying communicational gaps to be filled in;
- Discussing the outcome of the monitoring activities performed by the parties;
- Identifying possible improvements as regards the control and management of atmospheric emissions during the operation of the bypass;
- Assessing the possibility of future opportunities of cooperation, beyond the bypass process.

9.3.5. Given the manifested willingness for further constructive engagement, the EIB-CM future involvement would in principle be limited to the participation in this second meeting as an observer. If parties confirmed willingness to continue on a CAO Ombudsman process, the EIB-CM could co-facilitate and support efforts made by the CAO Ombudsman.

Control and monitoring of emissions to the environment

9.3.6. Further investigation work in relation to the bypass was required to achieve an adequate level of comfort that optimal monitoring and control of emissions to environment is taking place, and that internationally recognised limits are respected. In that sense, the EIB-CM envisaged the following steps:

- Clarify the reasons why the option of reducing production (which could have been completed with some imports) with construction of a third FTC was not so much considered;
- Further inquire about the past maintenance of FTCs and of GTCs and the reasons behind the delay by which the defections were detected;
- Review the data on which basis the decision was taken: measurement campaigns at stack level, opacity in the bake furnace and other;
- Review of limits and standards used (emissions and concentration levels in the air and in the water);
- Review of data available from the internal monitoring stations and investigation of anomalies;
- Review of data from the external monitoring stations;
- Obtain and review data on personal exposure by operational categories (construction, maintenance, etc.);
- Obtain more technical details (where, how, frequency with which instruments, etc) on the future monitoring of the emissions.

10. THE EIB-CM FURTHER WORK

10.1. After consultation by the EIB operational services with their counterparts of the EU co-financiers, DEG and Proparco, it was decided to support the EIB-CM further assessment work and it was agreed that they would be informed at all steps of the investigation process as well as being consulted on the outcome, conclusions and recommendations.

10.2. From February to May 2011, the EIB-CM conducted a further assessment of a compliance review nature, in line with the conclusions of its Initial Assessment, which included a site visit between 06 and 11.02.2011. During this visit the EIB-CM met with the complainants and with Mozal before the IFC CAO mediation started. Moreover, the EIB-CM attended the first mediation meeting between the parties an observer.

10.3. Part of the mission was an on-site visit to the Mozal aluminium smelter during which the EIB-CM reviewed a substantial amount of documentation, information and monitoring data provided by Mozal. Company policies and plans related to the bypass event and to the environmental management systems that have been reviewed extensively. The EIB-CM work relied upon monitoring data provided by Mozal.

10.4. On 28.03.2011 Mozal informed the EIB-CM that the FTC1 had gone back into normal operation on 17.03.2011. FTC2 had gone back into normal operation on 29.03.2001. This means that the bypass period for both FTC's was within the intended time frame (133 out 137 planned days). Furthermore Mozal informed that although the FTC's was back in normal operation, other project work was being completed throughout April and finally the Engineering project was fully completed by mid May.

10.5. In addition Mozal continued monitoring with SGS until 16 April 2011, which would give them a 2 week period to re-establish the baseline. Mozal also conducted emissions testing by SGS at the end of April or beginning of May to verify the concentrations within the stack.

10.6. During the process the EIB-CM conducted multiple telephone conversations and email exchanges with both Mozal and the complainants, in particular regarding the mediation process. Both parties had been cooperative in providing information.

11. CONCURRENT PROCESSES

11.1. Compliance Advisor/Ombudsman (CAO) Mediation

11.1.1. The complainants lodged a similar complaint with the Compliance Advisor/Ombudsman (CAO) for IFC.

11.1.2. Whenever more than one accountability mechanism of a co-financed project receives a complaint, the mechanisms endeavour to cooperate and if possible conduct site visits together. In this particular case the EIB-CM being the last one to receive the complaint, joined the CAO conducting their own initial assessment in December 2010 (see section 7).

11.1.3. The first mediation meeting was held during the EIB-CM mission on 08.02.2011 and the EIB-CM attended this as observer. Several mediation meetings took place and the EIB-CM has maintained a dialog with both the complainants and Mozal, in particular regarding the complainants' demand for an independent environmental audit regarding all Mozal operations.

11.1.4. Mid-October 2011, the EIB-CM was informed by the CAO that the coalition indicated their desire to end the mediation process a week prior and that the case would be transferred to Compliance within the next couple of months. The CAO transferred the complaint to Compliance in early December 2011. The EIB-CM kept in close contact with the CAO regarding the mediation process and its conclusion, coordinated and shared information at all times and continued to do so in the context of the CAO compliance work. The CAO report can be found on its website: http://www.cao-ombudsman.org/cases/case_detail.aspx?id=159

11.2. UK National Contact Point (UK NCP) for the OECD

11.2.1. The complainants lodged a similar complaint with the UK NCP ON 18.10.2010. The UK NCP forwarded the complaint to BHP Billiton on 19.10.2011 who submitted their preliminary response to the allegation on 17.11.2010. A meeting took place between the UK NCP and BHP Billiton on 24.11.2010.

11.2.2. The UK NCP accepted the complaint for further consideration but suspended the process under their Guidelines to take into account the parties' decision to undergo conciliation/mediation outside the UK NCP process due to their acceptance of the CAO mediation process. The UK NCP asked both parties to provide them with updates on the progress on the CAO mediation procedure whilst reserving the possibility to determine whether the UK NCP's complaint process needed to be reopened.

11.2.3. On 17.10.2011 the UK NCP informed both the CAO and the EIB-CM of their decision to put this complaint to live status as soon as the CAO would formally closed the "facilitating settlement" stage of the mediation process in Mozambique. Furthermore. the UK NCP had already informed both BHP Billiton and the coalition of the their decision

11.2.4. The UK NCP reasons for this decision are:

- The UK NCP understood from the parties that, although the parties were still talking to each other, discussions in Mozambique appeared to have reached a stalemate. As a result of the CAO closing the mediation process without the parties having reached an agreement on all the issues under discussion there was therefore no reason for the UK NCP to keep the complaint process under the OECD Guidelines suspended.
- The main purpose of the UK NCP complaint mechanism is to facilitate an agreement between the parties. Paragraph 4.1.1 of the UK NCP's published complaint procedures states that: "The preferred outcome of any complaint is an agreement between the parties". Therefore, by returning the complaint to live status, the UK NCP will be in a position to offer professional conciliation/mediation to the parties.

11.2.5. As with the CAO the EIB-CM closely followed-up with the UK NCP. Since the closing of the CAO mediation the UK NCP offered further mediation to the parties, which was accepted by Mozal but declined by the complainants. As a result the UK NCP is currently reviewing the case.

11.3. **Court case before Administrative Court, Maputo**

11.3.1. The complainants had at the time of lodging the complaint submitted a legal case to the Administrative Court in Maputo to request the immediate cancellation of the Special Act, the Special Authorization. On 19 November 2010 the court rejected their request.

12. FINDINGS AND CONCLUSIONS

12.1. **General**

12.1.1. The Mozal Environmental and Social Performance Annual Monitoring Report (AMR) covering the period 1 July 2009 – 30 June 2010 was issued in November 2010 and mentioned the bypass in the sections "Negative media attention", "NGO interaction" and finally on page 28 under "Air pollution emissions". The Quarterly report for quarter July 2010 to September 2010 briefly mentioned the planned bypass for FY11 in relation to media coverage but did not provide further information. Furthermore, Mozal indicated that no instances occurred which had a material adverse effect on the company and its operations for the same period.

12.1.2. As a result it was difficult for the EIB operational services to have known about the bypass and its actual starting date before receiving the email on 16.11.2010 that informed about the complaint. The quick reaction by the Bank as soon as the complaint had been received should be noted. Therefore, the EIB-CM concludes that there has not been an instance of maladministration on the part of the EIB operational services

12.1.3. The bypass, as the technical solution to deal with the problem was decided by the project Promoter, with no room for manoeuvre, on the basis of the then current FTCs conditions and the consequent urgency of the repair.

12.1.4. The control of air emissions and the monitoring of air quality by Mozal, agreed with MICOA, were reinforced by the intervention of the EIB-CM, the CAO and the IFC. The measurements and reporting were carried out by an independent and reputable company, SGS.

12.1.5. Although air emissions during the bypass have sometimes exceeded the applicable limits, from all the information available and corroborated by the independent study commissioned by the EIB-CM it appears that air emissions generated by the bypass seem unlikely to generate serious public health impacts.

12.1.6. 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.

12.1.7. Regarding the alleged non-compliance with the EIB Statement of Environmental and Social Principles and Standards the EIB-CM takes note that the initial transparency regarding the process and related stakeholders engagement has revealed deficiencies and that the monitoring and management of air emissions has revealed to be sub-optimal. Although further assurance is still requested (see § 13 Recommendations, below), Mozal seems now to be compliant with the EIB Statement of Environmental and Social Principles and Standards.

12.1.8. Regarding the stakeholders engagement between Mozal and the Coalition, it must be noted that the involvement of the CAO and of the EIB-CM has contributed to clarify the dialogue and to a better engagement in a meaningful way.

12.2. **The decision to go on bypass**

12.2.1. From the discussions held with the Borrower and from observations made within the scope of the initial assessment and of the investigations carried out by the EIB-CM, it appears that the options listed below had been examined by Mozal:

- Stop operations - This option seemed highly unfeasible. Mozal represents 70% of Mozambique exports, it has contributed (and still does) to the economic and social development of Mozambique by attracting external investment in the country, employs 1.200 people and sets an appealing precedent for further economic development of the region. Moreover, the start-up period of the 2 potlines is around 6-9 months, during which the emissions of fluoride would exceed the emissions that prevail during normal operations.
- Import anodes – This option appeared unfeasible because of its expensive nature (additional USD 35 m, from USD 10 m to USD 45 m), huge supply constraints (Mozal would need to import 27.000 anodes per month), with the consistent impact that this would cause on the stocking and transporting of the anodes.
- Stock anodes – This option could not work, as Mozal is running at full capacity and is already obliged periodically to import anodes, when there are operational problems with the anode bake furnaces (e.g. 8.200 anodes over a 3 month period in 2009).
- Sequential bypass – The net emissions to the environment would be the same and there would be an important risk of FTCs collapsing. (However, it appears that the second FTC was commissioned 3 years after the first one and probably corrosion levels were not the same.)
- Bypass of both FTCs – The chosen option; now reduced to a maximum of 134 days (120 days for each FTC, works started on 17 November 2010 for the first and on 2 December 2010 for the second). Mozal estimates that works can be finished quicker than the official 134 days.

12.2.2. The options of reducing production to bring emission to an acceptable level (stopping a number of pots) and of building a 3rd FTC (then replace the 2nd and finally demolish the 1st) does not seem to have been seriously examined.

12.2.3. Nevertheless, the EIB-CM concludes that the rationale for the decision to operate with a bypass of both FTCs seems 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 of the FTCs to collapse, thus representing 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 started only 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 would be informed of the findings of such investigation.

12.2.4. The final choice (i.e. operation in full by-pass) was made under the assumption that air concentrations of pollutants would globally be 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 the baseline data for the study could be disputed and Mozal's emissions management presented some weaknesses, the monitoring data available for the bypass period reasonably sustained such an assumption.

12.2.5. 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 in order to ensure that emissions from the anodes production lines are kept to acceptable levels.

12.3. **The authorisation by the national authorities (MICOA)**

12.3.1. As regards the alleged lack of transparency of the national authorities vis-à-vis the complainants with regard to the disclosure of environmental information relating to the by-pass project, it appears that the concerned Ministry enabled the parties, after issuing the special permit, to read a preliminary version of the Environmental Management Programme without its Annex. The complainants were not provided with a (paper or electronic) copy of the requested documents. In the light of the public health concerns raised by the bypass, this has contributed to an increase in the level of frustration felt by the Coalition.

12.3.2. As regards the authorisation and monitoring of the bypass operation, from the meetings held during the visit as well as from the assessment of the information gathered, it appears that, the Ministry of Environment initially led and ultimately coordinated the actions of the Government of Mozambique with regard to the

compliance of the bypass operation with national standards with a view to protecting the environment and the health of workers as well as the neighbouring communities. For this purpose, MICOA proposed the creation of a special committee, with representatives from the different Ministries, to decide on the authorisation, and ultimately the decision was taken by the Council of Ministers. This precautionary approach was balanced with a pragmatic one, as regards the options available for restoring Mozal's optimal environmental performance with the minimum possible negative impacts.

12.3.3. Within the framework of the procedure for granting a special authorisation for the by-pass, the government of Mozambique put forward some strong conditions for the authorization, such as:

- strict compliance with the announced deadlines;
- continuous monitoring of air concentrations;
- implementation of proper Contingency and Maintenance Plans;
- full engagement with affected and interested parties;
- close involvement by government during the rehabilitation period;
- adjustment of the Corporate Social Responsibility policy of Mozal in the area affected by the by-pass.

12.4. **Stakeholder's information and engagement**

12.4.1. Lack of access to information on the environmental impacts and management in relation to the bypass process, a general 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.

12.4.2. The bypass achieved national and international coverage; with news published across the country (e.g. "Mozal bypass – license to kill"[1] in "O País" dated 24/09/2010), with repercussions at the Mozambican Government and Parliament level. It triggered the close involvement of the Ministry of Environment (MICOA) with a set a conditions for the authorisation and led the Coalition to launch a complaint with several organisations. Against this background, Mozal management clearly improved the way it managed the bypass process, in terms of communication and stakeholders' engagement. Indeed, Mozal has now decided to further reengage with the Coalition to discuss the bypass, the monitoring process, data available and the overall kind of access to information the Coalition would like to have in order to better understand Mozal's environmental performance.

12.4.3. In this context, a stakeholders meeting was held on 15 December and the Coalition was invited to participate in the monitoring process. During the meeting, as one of the way forward to improve the relationship with the complainants and establish room for constructive dialogue on the operation of the bypass, Mozal management invited the Coalition to participate to a 2nd meeting to be held by mid-January 2011. The participation of representatives of the accountability mechanisms (CAO and EIB-CM) triggered by the complainants, as facilitators or observers, was requested by the Coalition and welcomed by Mozal.

12.4.4. Transparency and openness in the private sector is not as advanced as in the public sector and criticism from NGOs is not commonly positively received. Notwithstanding, during both the EIB-CM and the CAO processes, Mozal provided the complainants with information and invited them to visit the plant. This visit did take place and there was a commitment of improved long-term focussed communication and transparency.

<u>The CAO mediation process</u>

12.4.5. Overall, and independently of its final outcome, the whole CAO mediation process has been key in developing trust and mutual understanding between Mozal and the Coalition opening the opportunity for future dialogue and relation development. Indeed, communities and civil society representatives on one side and Mozal on the other side, have learned to better engage in a meaningful way when discussing the potential impacts of Mozal activities.

1 http://www.opais.co.mz/index.php/opiniao/86-lazaro-mabunda/9759-bypass-da-mozal-uma-licenca-para-matar.html

12.4.6. This dialogue process: (i) led both Mozal and the Coalition to a better understanding of other concerns and to examine potential solutions together and to explore different ways of addressing conflicts; (ii) led Mozal to agree on extensive information disclosure (on the bypass and on environmental management) to the Coalition and to perform further studies on public health.

Local community engagement

12.4.7. Between October 2010 and January 2011, Mozal collaborated with the Health NGO "Wake Up" and put 50 officers in the field to engage with the surrounding community about the bypass project. The way of communicating was through a door-to-door process and the NGO was well known within the surrounding communities as for the past 7-8 years these same officers had been involved in educating communities about HIV, malaria and other health issues on behalf of the Mozal Community Development Trust (MCDT). The map bellow shows Mozal and the surrounding communities, with whom the field officers engaged. Mozal had formal feedback sessions with the field officers every 2 weeks and according to the information provided by Mozal, no significant issues were raised by them from the community and they stated that the community expected more smoke / dust than was currently the situation.

12.4.8. Mozal also met regularly with different community leaders and especially the Chefe do Posto of Matola Rio and used of the following communication channels during the project: an Electronic Mail (Enviro.mozal@bhpbilliton.com), an Electronic Recorder: (258 21 735 556), an Address Contact, a Suggestions' Box at the Matola River's Administrative Post and a Contact's Book with Mozal at the Matola River's Administrative Post.

12.5. **Impact of bypass on air quality**

12.5.1. In March 2011 the EIB-CM conducted an independent review of the impact on the ambient air of the Mozal aluminium smelter under FTCs bypass, on the basis of the monitoring data made available by Mozal. Some of the values reviewed must be seen in the light that technically the FTCs are not treating certain emissions such as SO_2 and NO_2 and thus those emission results are independent from the FTCs being operational or not.

Comparison between the values measured and the reference values

12.5.2. The reference concentration on a daily basis is that of the ATSDR (American Agency for Toxic Substance Disease Registry). For HF, the reference value is a MRL (Minimal Risk Level) of 0.02 ppm, equivalent to 17 µg/m^3 as a daily average. No daily concentration measured on a continuous basis exceeds the MRL.

12.5.3. On an hourly basis, the World Health Organization (WHO, air-quality guidelines for Europe) recommends a value of 0.6 mg/m^3 (or 600 µg/m^3) to prevent any respiratory irritation. No hourly concentration exceeds the WHO reference value.

12.5.4. On a monthly basis, the maximum concentrations measured at the Sasol, North Eastern Fence, residential village, and MCDT points are 28, 17, 15 et 12 µg/m^3 respectively. Unless there were analytical errors, these weekly concentration levels tend to indicate that the daily reference value of 17 µg/m^3 may have been reached and/or exceeded at these points.

12.5.5. In addition, WHO (WHO air-quality guidelines for Europe) indicates a protective value to prevent undesirable effects on plants and livestock and by extension on human health: "*It has been recognized that fluoride levels in ambient air should be less than 1 µg/m^3 to prevent effects on livestock and plants. These concentrations will also sufficiently protect human health*". The European air quality value of 1 µg/m^3 is exceeded at every monitoring point.

General Conclusions

12.5.6. The direct emission of production fumes without their passing through the fume treatment centre (in the process of being renovated) has led to certain changes in the substance levels measured in the site's near environment.

12.5.7. The concentrations of HF, NO_2 and SO_2 are generally higher during the by-pass phase than before. The maximum levels recorded were higher than the maximum values recorded before the by-pass.

12.5.8. The average PM10 concentrations were of the same order of magnitude before and during the by-pass, but the maximum daily concentrations were higher during the by-pass than before.

12.5.9. To plot the ambient levels against a reference, the values used are those of the WHO and the ATSDR.

12.5.10. For HF, no hourly concentration measured on a continuous basis exceeded the value recommended by WHO to prevent respiratory irritation. Similarly, no daily concentration measured on a continuous basis exceeded the MRL of the ATSDR. However, at four monitoring points, high weekly concentrations measured by passive diffusion tend to indicate that daily concentrations higher than the ATSDR reference level were possible. The value given by the WHO for the protection of plants and livestock was exceeded at each point in the monitoring zone.

12.5.11. As regards benzo(a)pyrene measured at 2 points, and in the light of the excessively high quantification limit (1 ng/m^3) it was not possible to evaluate whether the target value fixed by the European Union (1 ng/m^3) would be respected at the conclusion of the monitoring during the by-pass.

12.5.12. With respect to suspended PM10 dust, all the concentrations measured, before and after the by-pass, were below the N° 1 intermediate target value of 150 µg/m^3. The daily average guide value of 50 µg/m^3 was exceeded more often during the by-pass phase than before.

12.5.13. As regards suspended PM2.5 dust, no daily concentration exceeded the intermediate target value of 75 µg/m^3, but the daily average guide value of 25 µg/m^3 was seen to be exceeded at the two monitoring points.

12.5.14. The weekly concentrations of SO_2 before the by-pass were below the daily average air quality guide value of 20 µg/m^3. During the by-pass, the first daily target level was respected (125 µg/m^3). The daily average air

quality objective of 20 µg/m^3 might have been exceeded, and it is not possible to give a ruling on the second target value.

12.5.15. Regarding NO_2, and given the weekly concentrations measured, it is likely that the annual average level was below the air quality guide value of 40 µg/m^3 whatever the mode of operation.

12.6. **Public health risk**

12.6.1. The key impact of the type of bypass under discussion, because of the increase of emissions to the air, is the potential risk of people's health in the surrounding community. It is important to identify the risk events that might occur, consider the worst case scenario, its likely impact and the actions to be taken to mitigate the risk. In this context, it is worth noting that the 3 pollutants affected by the operations of the FTCs that could potentially cause harm to human health are HF (fluorides), dust and Tars. SO_2 and NO_2 also have potential health effects but their emissions are not affected by the FTCs and therefore not relevant to the bypass.

Community Health Monitoring

12.6.2. Mozal worked with the Health Ministry to monitor the health clinics in the surrounding area for any abnormal increase in potential respiratory or other related health cases and met with MICOA on a 2 weekly basis to discuss any concerns arising on the community health monitoring. No irregular reports or concerns were raised by the Department of Health.

12.6.3. Mozal has also engaged with Dr Eulalia da Costa, who is an Occupational Health specialist in Mozambique, and who was also doing work for the Department of Health and Labour assessing cases in occupational health. She understands the industry and the process of evaluating occupational illness cases and was involved in heath complaints received from community members.

Public Health Risk Assessment

12.6.4. On request of the IFC (International Finance Corporation), Mozal initiated a human health risk assessment (HHRA) study concerning this operation, in order to understand the potential health impacts on the surrounding communities, including Mahlampsene, Sikuama, Mussumbuluko, Djuba, Meluluane and Xinonankila.

12.6.5. MOZAL approached the Council for Scientific and Industrial Research (CSIR) to assist with this exercise to address the following specific objectives: a) evaluation of the different approaches to assessing risks of chemical mixtures in the environment, b) to suggest and apply the best approach to PAH risk assessment based on the evaluation of the mixtures approach, and c) to understand the choice/application of benzo(a)pyrene (BaP) as an index chemical to PAH mixtures risk assessment. In addition MOZAL requested identification of applicable atmospheric target limits/standards or guidelines for the metals found in particulate matter (PM) emitted at MOZAL. The field trip for the assessment was performed on 17-18 January 2011 and the report was published in February 2011.

12.6.6. The risk assessment suggests that chronic non-cancer health effects are unlikely to develop, even in sensitive individuals. However, according to the CSIR report, the results need to be interpreted with caution given a number of assumptions inherent in the risk assessment. Moreover, the contribution of MOZAL to the incremental cancer risk based on monitored data cannot be established, as all sources of PAHs, including motor vehicles, wood burning and burning of garbage contribute to concentrations in ambient air.

Contingency Planning

12.6.7. Mozal has an appropriate Crisis and Emergency Management Plan describing the actions to be taken by Mozal Management in the event of any emergency or crisis which could have a significant impact on operations. Moreover, Mozal has setup a specific Emergency and Response Plan for bypass Project describing the type of risk event that can occur, the likelihood of this taking place, the potential impacts and the control measures suggested. This plan covered the following events:

- Ambient concentration levels exceed the legal limit's consistently in a specific area. All three pollutants are higher than the predicted values;
- Protest action with high level of community complaints (Even if ambient concentrations is within limits);
- Major catastrophe on people and environment.

12.7. **Control and monitoring of emissions to the environment**

12.7.1. In the EIB-CM opinion, it appears that the major deficiency in terms of control and monitoring was 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 are respected in relation to emissions to the air and ensure affective management control of such emissions.

Environmental management

12.7.2. It appears that by the time of the first EIB-CM visit, resources allocated to environmental management were rather limited. The situation had drastically improved at the time of the second visit, with two staff and one trainee fully dedicated to environmental management.

Monitoring at stack level (FTCs)

12.7.3. Mozal launches monitoring campaigns twice a month to measure the emissions to the air at FTC stack level and relies on the continuous measurement of opacity in the anode bake furnaces to manage its dust emissions. In this context, the need for continuous monitoring of emissions to the air at the stack level has been extensively discussed.

12.7.4. Mozal is now committed to investigate the continuous monitoring of dust at stack. One possibility will be to use a similar system as the leak detection for the GTC's. Mozal already has a mobile boreal laser for continuous HF monitoring in the stack. On the Tars, one possibility is to develop a relationship between the Opacity and tars.

Roofvents

12.7.5. Monitoring data and on site observations suggest that the roofvents make a significant contribution to air emissions. In this context, Mozal committed to investigate the installation of continuous dust measurements and continuous monitoring of HF (2 Boreal lasers, one for Potline 1 and one for Potline) for the roofvents.

Air quality monitoring station (permanent)

12.7.6. There is a monitoring station operated by Mozal within the facilities, which continuously monitors air concentration of all generated pollutants. The location, very close to stacks and protected by some trees, is far from optimal and Mozal has already planned to move it to a better location (Community Development Trust – Nelson Mandela Secondary School). The EIB-CM has been provided with the data available for one full month, starting with the bypass (17 November 2010).

12.7.7. Analysis of records show that (i) no major deviations have been detected (ii) but errors and inconsistencies have been found that lead to believe that the station was not working properly. This has been confirmed by a subsequent audit by Mozal.

12.7.8. Mozal committed to move the air quality monitoring station from the current location to the MCDT or other adequate position and ensure that a planned maintenance plan is in place for the station.

Air quality measurement campaign (bypass)

12.7.9. The measurement of atmospheric concentration levels of pollutants (HFs, dust PM_{10} and TARs) outside the facilities and within a radius of 2 km started a few weeks before the bypass and was outsourced to an independent, experienced and reputable company, SGS. The air samples were collected each day and sent to

an independent laboratory and results were available within 2 weeks. This is the process to which Mozal invited the Coalition to participate and this was the monitoring data disclosed to external parties.

12.7.10. The use of the limits established in the Environmental Management Plan and in the SE Solutions' assessment have been challenged by the complainants. In this context, and to avoid unclearness and inconsistency, the limits and standards used (hourly, daily or annual) needed clarification.

Occupational Health

12.7.11. During the visit, the EIB-CM had the opportunity to discuss with Mozal about company's Occupational Health policy, as an important share of the continuous monitoring of the effect of the bypass on the population, in particular Mozal's workforce. Mozal has in place a comprehensive Occupational Health and Hygiene Management Plan, has monitored the concentrations inside its premises and exposure levels for workers and taken the adequate protection measures (mainly the use of a full time respirator).

13. RECOMMENDATIONS

13.1. 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 and in order to attain confidence that such situation does not happen again in the future and that emissions to the environment are adequately monitored and controlled, the EIB-CM recommends that an independent technical review and assessment of the existing environmental management and monitoring systems, and reporting mechanisms in place at Mozal will be undertaken.

13.1.1. This review should be seen in the context of the framework of the environmental covenants agreed with the co-financiers under the CTA (Amended and Restated Common Terms Agreement) and has obtained agreement from all parties involved, in particular Mozal. This review will be part of the EIB-CM follow-up process, which is to be performed in 2012, and will use a reputable independent consultant under EIB-CM supervision. The establishment of the detailed Terms of Reference, the selection process and the supervision will be done in close collaboration with EIB operational services.

13.1.2. Such 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"

13.2. 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 urges 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
- The establishment and further development of a broad forum/mechanism of dialogue with the civil society in the context of management of environmental impacts

13.3. The EIB-CM in collaboration with other relevant EIB services will ensure follow-up on the progress of the recommendations and remedial actions no later than 6 and 12 months after the date of this Conclusions Report.

F. Alcarpe
Head of Division
Complaints Mechanism
20.04.2012

E. de Kruijff
Senior Complaints Officer
20.04.2012

CONCLUSIONS REPORT

PART II – SUPPLEMENTARY INFORMATION

STUDY ON THE IMPACT ON THE AMBIENT AIR

14. INTRODUCTION

14.1. As part of a project to renovate the Fume Treatment Centres, a by-pass in the fume treatment installation leading to an emission of untreated process gases has been authorized from 17 November 2010. In order to assess the environmental impact of the by-pass, the operator of the industrial site began a monitoring programme in the ambient air two weeks before going into bypass mode. The monitoring has been in progress since the introduction of the by-pass during the renovation works on the fume treatment unit.

14.2. The measurements in the ambient air comprise:

- Continuous HF monitoring.
- Passive tube HF monitoring.
- PAH monitoring.
- Monitoring of suspended PM10 and PM2.5 dust.
- Passive tube monitoring of NO_2 and SO_2.

14.3. The environmental study is based on the following documents:

- Description of the installations, e-mail of 5 April 2011,
- Environmental measurements forwarded by mail of 5 April 2011 (HF_2011.03.18-JSP.ZIP, Monitoring data.zip including the SGS report Mozal bypass emission testing draft report.pdf)
- Dossier 02. Ambient monitoring information FTC bypass.zip
- Dossier 03. FTC Emission testing
- Dossier 05. Metal analysis
- FTC Stakeholder Engagement and monitoring feedback – 22 December 2010
- FTC Stakeholder Engagement and monitoring feedback – 12 January 2011
- Mozal air quality station calibration report – SGS December 2010

15. EVALUATION OF THE IMPACT ON THE AMBIENT AIR

15.1. **Nature of the emissions**

The Mozal smelter in Maputo has two production units and two fume treatment centres, referred to as FTC 1 and FTC 2. Because of serious deterioration due to corrosion the two FTCs had to be rebuilt. This reconstruction operation made it necessary to release the untreated fumes from the aluminium smelter ovens directly into the atmosphere during the period of the works. Emission goes via the existing chimneys and this phase is called a by-pass. The by-pass started on 17 November 2010.

The aluminium smelting process generates emissions of dust particles, fluoride, PAH, and oxides of nitrogen and sulphur.

The company SGS was commissioned by Mozal to carry out emission monitoring before and during the by-pass (Dossier 03. FTC Emission testing and Monitoring data.zip). The conclusions of the project report are set out in Table 1.

Table 1 : Evolution of the parameters of the by-pass phase as compared with the emissions with fume treatment in operation

Parameter	FTC1	FTC2	Observations
speed	Greater	Greater	Linked to the newly installed ventilators and to cleaner pipes. Better atmospheric dispersion of the emissions
Particulate concentration	Lower	Greater	Linked to the combustion conditions. Incomplete combustion → high quantity of particulate matter
PAH	Greater	Lower	
fluorides	Consistent	Consistent	The fluorides concentration depends entirely on the impurities present on the anodes.
SO_2	Lower	Lower	-
NO_x	Consistent	Greater	-
CO	Significantly lower	Significantly lower	Improved combustion conditions

The environmental monitoring programme considered the same substances to be measured as those measured on emission

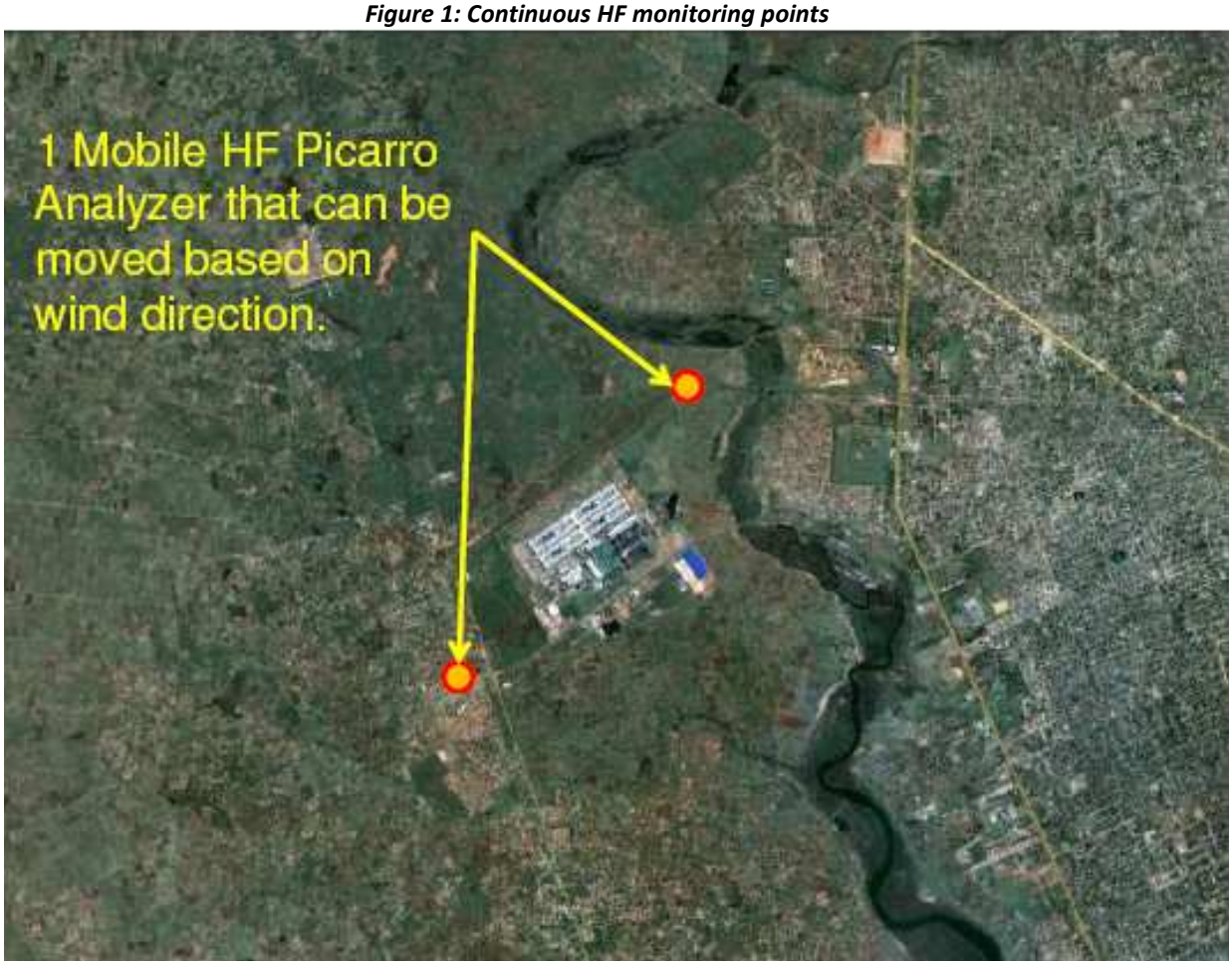
15.2. Measurements in the ambient air

The environmental measurements in the ambient air related to the following substances:

- Fluorides with continuous monitoring and passive monitoring,
- PAH,
- PM10 and PM2.5
- Passive SO_2 and NO_2 monitoring.

Fluorides Continuous HF monitoring

Figure 1: Continuous HF monitoring points



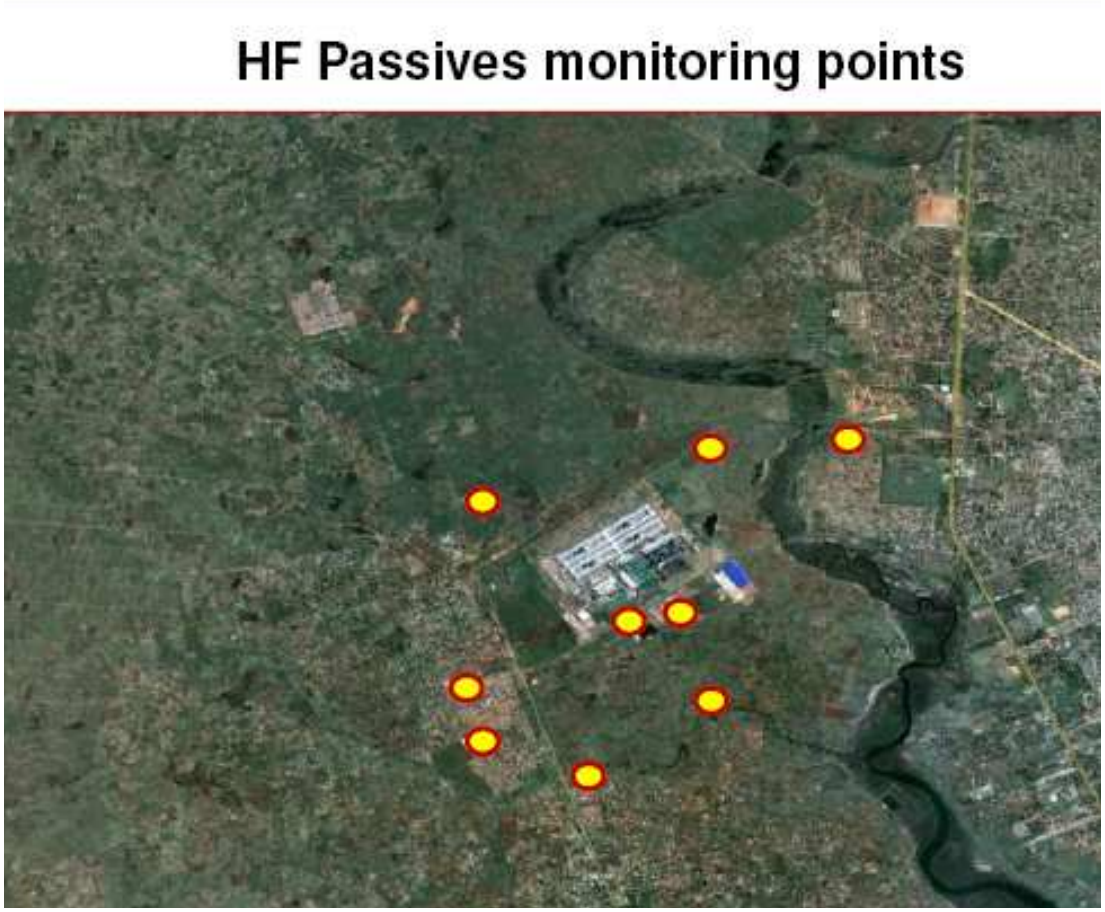
The continuous monitoring was carried out at two points and alternating between MCDT and North Eastern Fence. The points at which the monitoring is carried out are chosen on the basis of the wind direction. The monitoring results averaged on an hourly and a daily basis are set out in Annexes 1 and 2.

Before the by-pass, the maximum hourly concentration measured was 10 µg/m^3 and the maximum daily concentration measured was around 3 µg/m^3. With a period of one month, it can be assumed that the data are representative to describe the basic operation with the fume treatment centre in operation.

The by-pass phase, lasted approximately 3 months. The maximum hourly concentration measured was 36 µg/m^3 on 7 December 2010. Daily concentrations of over 6 µg/m^3 were measured during 2 days in December 2010 and on 1 day in January 2011. Since February 2011, the hourly and daily concentrations were below 2 µg/m^3. It has not been possible to attribute this drop in concentration to any particular event.

Programme of HF passive monitoring

Figure 2: HF monitoring points (passive tubes)



The passive HF monitoring was carried out on a weekly basis using passive diffusion tubes.

Before the by-pass, the maximum weekly concentration measured was 8 µg/m^3 at the Sasol point situated at the southern limit of the industrial site.

During the by-pass and until 2.03.2011, the maximum weekly concentration was 28 µg/m^3 at the Sasol point.

The maximum weekly concentrations measured at each measurement point are set out in Table 2.

Table 2: Maximum concentrations

Name of the point	Location	Maximum weekly concentration (µg/m^3)	Week during which the maximum was recorded
MCDT	25º 55' 37.7'' S 32º 23' 47.4'' E	12	Week 15 23/02 – 02/03/11
North Eastern Fence	25º 54' 11.8'' S 32º 24' 51.5'' E	17	Week 13 09/02 – 16/02/11
Dendustri	25º 55’ 12.0’’ S 32º 24’ 50.2’’ E	7.6	Week 4 08/12 – 15/12/10
Sasol	25º 55' 18.2'' S 32º 24' 25.8'' E	27.7	Week 4 08/12 – 15/12/10
Sewage Plant	25º 55' 41.1'' S 32º 24' 50.3'' E	6.1	Week 4 08/12 – 15/12/10
Bon Art	25º 54' 38.7'' S 32º 23' 36.6'' E	5.9	Week 5 15/12 – 22/12/10
Boane village	25º 55' 57.0 S 32º 23' 57.2'' E	4.3	Week 2 24/11 – 01/12/10
Nelson Mandela School	25º 56' 20.7'' S 32º 24' 22.4'' E	5.5	Week 2 24/11 – 01/12/10
Residential Village	25º 53' 27.9'' S 32º 25' 24.2'' E	14.9	Week 9 12/01 – 19/01

Comparison between the values measured and the reference values

The reference concentration on a daily basis is that of the ATSDR (American Agency for Toxic Substance Disease Registry). For HF, the reference value is a MRL (Minimal Risk Level) of 0.02 ppm, equivalent to 17 µg/ m^3 as a daily average. No daily concentration measured on a continuous basis exceeds the MRL.

On an hourly basis, the World Health Organization (WHO, air-quality guidelines for Europe) recommends a value of 0.6 mg/m^3 (or 600 µg/m³) to prevent any respiratory irritation. No hourly concentration exceeds the WHO reference value.

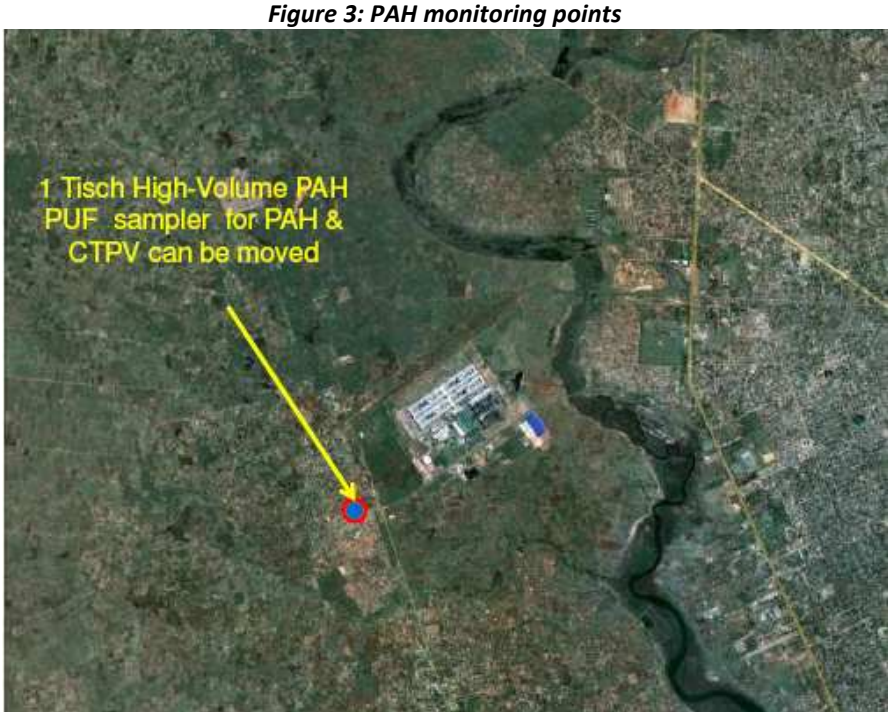
On a monthly basis, the maximum concentrations measured at the Sasol, North Eastern Fence, residential village, and MCDT points were 28, 17, 15 et 12 µg/m^3 respectively. Unless there were analytical errors, these weekly concentration levels tend to indicate that the daily reference value of 17 µg/m^3 might have been reached and/or exceeded at these points.

In addition, WHO (WHO air-quality guidelines for Europe) indicates a protective value to prevent undesirable effects on plants and livestock and by extension on human health: “*It has been recognized that fluoride levels in ambient air should be less than 1 µg/m^3 to prevent effects on livestock and plants. These concentrations will also sufficiently protect human health*”. The European air quality value of 1 µg/m^3 is exceeded at every monitoring point.

15.2.1. PAH

The PAH monitoring was carried out using a dynamic high-volume sampler at a point in the environment of the aluminium smelter.

Figure 3: PAH monitoring points



The samples were taken from 10 November 2010 to 5 January 2011, and resumed on 9 February 2011. The analyses were carried out on samples representing 24 hours of exposure.

Few benzo(a)pyrene concentrations in the daily samples were above the analytical quantification limits (15 days / 82 days of monitoring). The maximum daily concentration measured was 3.6 ng/m^3 on 2 January 2011. The quantification limit indicated in the results files seems high to us since it is set at 1 ng/m^3.

The target value fixed in the European Union is 1 ng/m^3 as an annual average, to be adhered to as of 31/12/2012. With a quantification limit of the order of the target value, it will not be possible at the end of the monitoring to estimate whether or not the average of the concentrations measured exceeds 1 ng/m^3.

On the basis of epidemiological data, WHO has established a unit excess risk factor for a whole life exposure to benzo(a)pyrene. The concentration of BaP leading to an increased risk of cancer of 1/100 000 is 0.12 ng/m^3; in other words, a person exposed during his whole life to a concentration of 0.12 ng/m^3 on average has an increased risk of 1/100 000 of developing a cancer due to this exposure.

15.2.2. Suspended PM10 and PM2.5 dust

<u>PM10 monitoring</u>

The monitoring of suspended PM10 dust was carried out using a Minivol sampler. The monitoring took place at two points in the environment of the industrial site, as shown on the following photograph. Monitoring took place from 12 October to 16 November before the by-pass, and then as from 17 November 2010 with the fumes being by-passed. As from 6 December 2010, a third point located in the rear zone was added.

Figure 4: Location of the suspended dust monitoring points

The PM10 concentrations measured on a daily basis are shown in Table 3.

Table 3: PM10 concentrations (µg/m^3)

Before the by-pass	Average concentration	Maximum concentration	Minimum concentration
Nfence	33	52	15
MCDT	27	57	4

By-pass in operation	Average concentration	Maximum concentration	Minimum concentration
Nfence	27	70	2
MCDT	28	68	<2
Background	38	85	<2

For the 24 hour measurements, the reference values for PM10 given by WHO are:

- 150 µg/m^3, N° 1 intermediate target value,
- 50 µg/m^3, guide value.

During the monitoring period of 21 days before the by-pass, the guide value of 50 µg/m^3 was exceeded once at the N. FENCE point and twice at the MCDT point.

During the by-pass as from 18 November 2010 and until 1 March 2011 (104 days), the guide value of 50 µg/m^3 was exceeded 5, 9 and 17 times at the N. FENCE, MCDT and rear zone points respectively.

Not having information on the location of the reference zone point, we cannot provide a clear conclusion, but it seems that this point may not have been carefully located away from all impacts. If this point has been located outside a potential impact zone of the Mozal site, it is likely that other dust sources contribute to the levels measured at this point.

No daily PM10 concentration exceeds the N° 1 intermediate target value of 150 µg/m^3.

Even if the average concentrations before and during the by-pass showed little change, it can be noted that the maximum hourly concentrations were higher during the by-pass. However, the longer monitoring period of by-pass operation than that of normal operation does not permit any firm conclusion as to an impact of the direct emissions into the environment.

PM2.5 monitoring

The suspended PM2.5 dust monitoring was carried out using a Minivol sampler. The monitoring was carried out at the same points as the PM10 monitoring. The PM2.5 monitoring was carried out from 7 January 2011 to 1 March 2011, with the fume treatment system being by-passed.

Table 4: Daily PM2.5 concentrations (µg/m^3)

	N Fence	MCDT
Average	14	9
Maximum	35	33
Minimum	< 2	< 2

For the 24 hour measurements the reference values for PM2.5 given by WHO are:

- 75 µg/m^3, N° 1 intermediate target value.
- 25 µg/m^3, guide value.

No daily PM2.5 value exceeded the N° 1 intermediate target value. However, the guide value of 25 µg/m^3 as an average over 24 hours was exceeded 6 times at the N. FENCE point and once at the MCDT point over the 8 week monitoring period. The average concentrations obtained over the monitoring period were around the WHO annual average target value of 10 µg/m^3.

Not having as a reference concentrations measured before the by-pass, it is not possible to evaluate any impact of the by-pass on the ambient air.

Monitoring of metals in the PM10

Two samples of PM10 were analysed for their metal and mineral content. One sample came from the MCDT point and the other from the N. FENCE point.

The metals levels at the N FENCE point were generally higher than those obtained at the MCDT point. The elements most present are aluminium, boron, calcium, magnesium, sodium, sulphur, potassium, iron and zinc.

15.2.3. Passive SO2 and NO2 monitoring

Passive SO_2 and NO_2 monitoring was carried out on a weekly basis using passive diffusion tubes. The monitoring points were identical to those used for HF monitoring.

SO_2:

Before the by-pass, the maximum weekly concentration measured was 7.6 µg/m^3 at the North Eastern Fence point. Weekly concentrations of the order of 7 µg/m^3 were measured at 4 points of the site environment: North Eastern Fence, Dendustri, Sasol and Boane village.

During the by-pass and until 2/03/2011, the maximum weekly concentration observed was 41 µg/m^3 at the Sasol point.

The maximum weekly concentrations measured at each monitoring site are set out in Table 5.

Table 5: Maximum SO_2 concentrations

Name of the point	Location	Maximum weekly concentration (µg/m^3)	Week during which the maximum was recorded
MCDT	25º 55' 37.7'' S 32º 23' 47.4'' E	2.4	Week 8 05/01/11 – 12/01/11
North Eastern Fence	25º 54' 11.8'' S 32º 24' 51.5'' E	34.9	Week 14 16/02/11 – 23/02/11
Dendustri	25º 55’ 12.0’’ S 32º 24’ 50.2’’ E	11.3	Week 8 05/01/11 – 12/01/11
Sasol	25º 55' 18.2'' S 32º 24' 25.8'' E	40.6	Week 8 05/01/11 – 12/01/11
Sewage Plant	25º 55' 41.1'' S 32º 24' 50.3'' E	37.3	Week 14 16/02/11 – 23/02/11
Bon Art	25º 54' 38.7'' S 32º 23' 36.6'' E	7.9	Week 13 09/02/11 – 16/02/11
Boane village	25º 55' 57.0 S 32º 23' 57.2'' E	5.0	Week 14 16/02/11 – 23/02/11
Nelson Mandela School	25º 56' 20.7'' S 32º 24' 22.4'' E	6.2	Week 14 16/02/11 – 23/02/11
Residential Village	25º 53' 27.9'' S 32º 25' 24.2'' E	14.4	Week 2 24/11/10 – 01/12/10

WHO has fixed SO_2 guide values on a daily basis. The first intermediate target value is 125 µg/m^3; this was the guide value in 2000. The second intermediate target value is 50 µg/m^3, an objective that is attainable by controlling transport and industrial emissions or energy production. The guide value for air quality is fixed by WHO at 20 µg/m^3, as a daily average.

Before the by-pass, no weekly average concentration exceeded 8 µg/m^3. It is possible under these conditions, that the daily average concentrations are below the daily average guide value for air quality of 20 µg/m^3 .

During the by-pass, no weekly average concentration exceeded 41 µg/m^3. On the basis of these results it is likely that the first daily target level of 125 µg/m^3 was respected.

The second target value of 50 µg/m^3 as a daily average was probably respected overall, but with weekly average concentrations in excess of 35 µg/m^3 it is not certain that the daily average values did not exceed 50 µg/m^3.
During the by-pass, the daily average air quality objective of 20 µg/m^3 might have been exceeded.

<u>NO_2:</u>

Before the by-pass, the maximum weekly concentration measured was 7.8 µg/m^3 at the Dendustri point. Weekly concentrations above 6 µg/m^3 were measured at 3 points of the site environment: North Eastern Fence, Dendustri and Bon Art.

During the by-pass and until 2/03/2011, the maximum weekly concentration recorded was 16,5 µg/m^3 at the MCDT point.

The maximum weekly concentrations measured at each monitoring point are set out in Table 6.

Table 6: Maximum NO_2 concentrations

Name of the point	Location	Maximum weekly concentration (µg/m^3)	Week during which the maximum was recorded
MCDT	25º 55' 37.7'' S 32º 23' 47.4'' E	16.5	Week 4 08/12/10 – 12/12/10
North Eastern Fence	25º 54' 11.8'' S 32º 24' 51.5'' E	15.1	Week 8 05/01/11 – 23/02/11
Dendustri	25º 55’ 12.0’’ S 32º 24’ 50.2’’ E	10.8	Week 3 04/12/10 – 08/12/10
Sasol	25º 55' 18.2'' S 32º 24' 25.8'' E	4.1	Week 14 16/02/11 – 23/02/11
Sewage Plant	25º 55' 41.1'' S 32º 24' 50.3'' E	5.6	Week 12 02/02/11 – 09/02/11
Bon Art	25º 54' 38.7'' S 32º 23' 36.6'' E	7.2	Week 14 16/02/11 – 23/02/11
Boane village	25º 55' 57.0 S 32º 23' 57.2'' E	4.2	Week 13 09/02/11 – 16/02/11
Nelson Mandela School	25º 56' 20.7'' S 32º 24' 22.4'' E	10.3	Week 5 15/12/10 – 22/12/10
Residential Village	25º 53' 27.9'' S 32º 25' 24.2'' E	9.5	Week 13 09/02/11 – 16/02/11

The WHO has established an annual average air quality guide value of 40 µg/m^3. On the basis of the levels measured in the site environment, this value should not be exceeded on average over a year.

It appears that the concentrations measured in the by-pass phase might have been higher than those measured before the by-pass but the levels recorded remained below the WHO limit value.

16. CONCLUSION

The direct emission of production fumes without their passing through the fume treatment centre (in the process of being renovated) has led to certain changes in the substance levels measured in the site’s near environment.

The concentrations of HF, NO_2 and SO_2 are generally higher during the by-pass phase than before. The maximum levels recorded were higher than the maximum values recorded before the by-pass.

The average PM10 concentrations were of the same order of magnitude before and during the by-pass, but the maximum daily concentrations were higher during the by-pass than before.

To plot the ambient levels against a reference, the values used are those of the WHO and the ATSDR.

For HF, no hourly concentration measured on a continuous basis exceeded the value recommended by WHO to prevent respiratory irritation. Similarly, no daily concentration measured on a continuous basis exceeded the MRL of the ATSDR. However, at four monitoring points, high weekly concentrations measured by passive diffusion tend to indicate that daily concentrations higher than the ATSDR reference level were possible. The value given by the WHO for the protection of plants and livestock was exceeded at each point in the monitoring zone.

As regards benzo(a)pyrene measured at 2 points, and in the light of the excessively high quantification limit (1 ng/m^3) it was not be possible to evaluate whether the target value fixed by the European Union (1 ng/m^3) would be respected at the conclusion of the monitoring during the by-pass.

With respect to suspended PM10 dust, all the concentrations measured, before and after the by-pass, were below the N° 1 intermediate target value of 150 $\mu g/m^3$. The daily average guide value of 50 $\mu g/m^3$ was exceeded more often during the by-pass phase than before.

As regards suspended PM2.5 dust, no daily concentration exceeded the intermediate target value of 75 $\mu g/m^3$, but the daily average guide value of 25 $\mu g/m^3$ was seen to be exceeded at the two monitoring points.

The weekly concentrations of SO_2 before the by-pass were below the daily average air quality guide value of 20 $\mu g/m^3$. During the by-pass, the first daily target level was respected (125 $\mu g/m^3$). The daily average air quality objective of 20 $\mu g/m^3$ might have been exceeded, and it is not possible to give a ruling on the second target value.

Regarding NO_2, and given the weekly concentrations measured, it is likely that the annual average level was below the air quality guide value of 40 $\mu g/m^3$ whatever the mode of operation.

17. LIST OF THE DOCUMENTS REVIEWED

(To be reviewed / completed)

- Ambient Monitoring information FTC Bypass: This is an update of the ambient monitoring data provided by SGS up to date.
- FTC Emissions testing data from Mozal: Data on the emissions testing performed by Mozal in December and January as well as an overview of Total emissions data for December and January for Mozal. We are due to receive the updated emissions campaign measurements in December from SGS next week.
- Operational Measures: The data for the GTC dust leak detection, ABF1+2 Opacity measurements and also a report on the peak in PAH.
- Metals Analysis performed by SGS on the PM10 samples
- Air Quality Monitoring Station – Mozal assessment report from SGS
- Interested Party Meeting invitation for 22 Feb 2011
- Personal Health and Hygiene Monitoring results done for the bypass project
- Stakeholder Engagement and Monitoring feedback documents
- HF, Ambient and emissions testing data from SGS up to date
- Public Health risk assessment performed by the CSIR in January/February
- PAH sampling results 23 April 2011
- Mozal passives (HF) Master Results 20 April 2011
- Passive Master Results sheet 20 April 2011
- Ambient PM10 16 April 2011
- Ambient PM2.5 1 March 2011
- HF date 20 April 2011
- Ambient PM10 Final
- Mozal SO2NO2 final results
- FTC rebuild project closing session 9 June 2011
- Final emissions testing report done through SGS that measure the performance of the FTC's after the rebuild and repair project
- Special Authorisation from MICOA
- FY2011 Environmental and Social Performance Annual Monitoring Report (AMR)
- The Fume Treatment Centre (FTC) Rebuild at Mozal Environmental Close-Out Report
- Environmental measurements forwarded by mail of 5 April 2011 (HF_2011.03.18-JSP.ZIP, Monitoring data.zip including the SGS report Mozal bypass emission testing draft report.pdf)
- Dossier 02. Ambient monitoring information FTC bypass.zip
- Dossier 03. FTC Emission testing
- Dossier 05. Metal analysis
- FTC Stakeholder Engagement and monitoring feedback – 22 December 2010
- FTC Stakeholder Engagement and monitoring feedback – 12 January 2011
- Mozal air quality station calibration report – SGS December 2010
- MP.MOZ.009 - Crisis and Emergency Management Plan
- MP.MOZ.019 - Occupational Health and Hygiene Management Plan

ANNEX 1 - INTEGRAL TEXT OF THE COMPLAINT

Justiça Ambiental (JA!) in partnership with Livaningo, Liga Moçambicana dos Direitos Humanos, Centro Terra Viva, Kulima and Centro de Integridade Pública have been working together in the issue regarding the proposed 6 months bypass of Mozal. The coalition found Mozal in breach of the EIB Statement of Environmental and Social Principles and Standards and therefore considers it appropriate to file the complaint.

BHP Billiton operates the Mozal aluminium smelter located 17 kilometres from Maputo, in the outskirts of Matola city, in a densely populated area. Mozal was officially opened on 29 September 2000. BHP Billiton has a 47.1 per cent interest in the joint venture. The other partners are: Mitsubishi Corporation (25 per cent), Industrial Development Corporation of South Africa Ltd (24 per cent), and the Government of Mozambique (3.9 per cent). The European Investment Bank granted a loan to the Mozal project of at least 32.9 million US Dollars (possible outdated amount; source BHP Billiton website).

In a public meeting of 5 April 2010 representatives of Mozal announced that they had identified the need to proceed with the rehabilitation of the smoke and gas treatment centres budgeted at 10 million US Dollars, an investment urgently needed to ensure that the environmental emissions from Mozal comply with standards required by law. The relevant standards it aims to comply with by way of this rehabilitation are the domestic Regulamento sobre Padrões de Qualidade Ambiental e de Emissão de Efluentes (Decreto 2 Junho 2004 n. 18/2004), the 2005 World Health Organization Air Quality Guidelines and the 2007 International Finance Corporation Environmental Health and Safety Guidelines.

During this rehabilitation Mozal would operate under bypass for 6 months starting in November 2010, which would mean that the exhaust fumes of the smelter would be released to the environment without passing through the filters. For this purpose Mozal required and obtained a special authorization issued by Ministry of Coordination of Environmental Action (MICOA), conditional on the presentation of an Environmental Management Plan (EMP), Contingency Plan and Mozal also was required to review their Social Responsibility Policy.

Given the seriousness of the issue and the passive way it was dealt with, JA! wrote a letter, dated 08 April 2010, REF: 184/JA/2010, to MICOA (annex available) with copies to several institutions, requesting clarifications about:

- the whole process of acquiring this special license,
- if this had already been issued,
- if an environmental impact assessment had been elaborated,
- if the communities had been consulted and were aware of potential hazards that they would be exposed to,
- if other alternatives had been considered,
- what would be the real implications to the environment and to the public health,
- and what mitigation measures would be planned, among other questions.

In response to this and after great insistence, JA! received a letter from MICOA, dated 14 June of this year Note N. 26/SP/GM/MICOA/10 (annex available), which informed the following:

- MICOA asked Mozal to develop an EMP for the mitigation of possible impacts of the proposed activities and that to date of submission of JA!'s letter, Mozal still did not have a permit from MICOA, this being dependent on the submission of the EMP;
- In the process, 3 alternatives were considered, namely stopping the furnace, increasing the temperature of the anodes and special authorization for continuous Bypass, being the last one considered as the most feasible;
- A study of dispersion and deposition of gases and smoke emitted by Mozal's Smoke Treatment Centers and Gas Treatment Centers was carried out using the TAPM model, to determine the areas potentially affected and assess their impacts during the 6 months mentioned. The results of this study indicated that, for being the most relevant from the standpoint of danger to public health and the environment, thus being regulated by Law, the following substances were found: Hydrogen fluoride (HF), Sulphur dioxide (SO2), Nitrogen dioxide (NO2) and Ozone (O3);

- The areas potentially most affected by the gases HF, SO2, NO2 are limited to a maximum radius of around 40km from Mozal), locations beyond a radius of 100km from Mozal's precinct, and regarding O3 and PM10 (airborne particles with diameters smaller than 10 's precinct may be affected, and these can be within or outside the national territory;
- The study and simulations have not been made public yet, however their conclusions were presented at the Council of Ministers;
- The concentrations and the deposition rates of the polluting substances predicted in the used model are not significant, thus there appears to be no significant risk of acute or chronic exposure by communities and the environment to these substances during the Bypass. However, it is necessary to maintain a permanent surveillance on the potentially affected sites, being Mozal's responsibility the preparation of a Contingency Plan to address eventual problems and also the company should review its policy of social responsibility.

Apart from the severity of the potential health risks of the released substances (annex available), the coalition insisted in its attempts to keep obtaining information from Mozal and MICOA and enhanced its worries about the situation for several reasons: -

- It seems incomprehensible that Mozal would consider an investment of 10 million US Dollars to comply with legal standards if there is no need for it. The international and domestic maximum acceptable parameters of emission are created precisely because of the risk for public health and environment, hence the need and requirement for companies to place suitable filters.
- At various occasions Mozal presented different contradictory reasons for the need for rehabilitation. The only common point between the versions is a structural problem that could cause the collapse of the treatment due to the corrosion of an 8mm thick steel sheet by 1mm.
- Mike Fraser, president of Mozal, made at a meeting reference to poor quality of steel used in treatment centers as causing contingencies. In another, the alleged cause was the expiration of the lifetime of the treatment centers. If the foreseeable lifetime was known to be about 10 years, the initial Environmental Impact Assessment in 2001 should have provided an adequate solution.
- Both situations reflect a gross negligence on the part of Mozal. Either they used inappropriate material or failed in their initial Environmental Impact Assessment. Without making clear what the exact reasons for rehabilitation are, MICOA is not competent to issue a special authorization, as the relevant legislation only delegates this competence for extraordinary emission due to unforeseeable circumstances (article 22 Decreto 18/2004).

In October 2004, in Richards Bay, South Africa, Hillside Aluminium another subsidiary of BHP Billiton, worked on bypass for 72 hours. Hillside released a health warning in the press, for "people with asthma and others with respiratory problems, or who have low tolerance for smoke and dust, to remain indoors" (source: http://www.groundwork.org.za/Press%20Releases/05Oct04Hillside.asp). This difference of criteria and behaviour of BHP Billiton in South Africa and Mozambique is highly questionable. In August 2010 the South African organization Ground Work has conducted air sampling during three weeks the area close to Mozal. The limited sampling showed already that, even during regular operational modus, the concentration of dust particles was extremely worrisome from health perspectives and above both national and international limits.

The consequential air quality during the bypass operation will be even more unforeseeable. Please contact us for the results of this sampling. MICOA has given the requested special authorization for the bypass operation, but to date both Mozal and MICOA have refused to provide a copy of this authorization. After insisting attempts of the coalition to get access to the two studies on which the alleged authorization is based on, we were allowed to view them in the MICOA library for reading purposes only. Mozal saw itself at no occasion required to present the documents when requested, annexes of request and response available.

The studies available at MICOA library are the EMP Version 1.0 dated 22 March produced by Mozal and an 'independent' study "Forecast of the Dispersion and deposition of pollutants to the environment expected during the rehabilitation of Smoke and Gases Treatment Centers" allegedly undertaken by researchers of the Eduardo Mondlane University in Maputo (annex available). In order to make an in-depth analysis of the presented data JA! saw itself forced to transcribe sections of the EMP and the University study by hand. Beside the obscurity of the documents, the studies itself are full of controversies and voids. The EMP does not contain the annex it refers to in its report and it does not sufficiently evaluate alternatives to a bypass operation. As mentioned above, in the letter from MICOA of 14

June 2010, JA! was informed that Mozal still did not have a permit from MICOA, this being dependent on the submission of the EMP, whereas the EMP in the MICOA library is already dated 22 March 2010. The University study does not give any information on authors, date and methodology (detailed comments available). Moreover, one of its authors has informed us publicly, (on a television debate) that the study was undertaken with data provided by Mozal itself. The proclaimed independency of the study is thereby nullified.

Requests for annual reports regarding Mozal's environmental performance and initial environmental permit have been conditioned on signing a confidentiality statement or have been unduly delayed; therefore JA! at no point in the past has succeeded in obtaining any data on Mozal's emissions of smoke and gas. Despite three public meetings (one for NGO's, another for the media and the third for all interested and affected parties), the public remains ill-informed about the exact risks of the bypass operation due to the lack of access to impartial information and transparency. During these meetings the only information given was in the form of a Power Point presentation, of which the coalition has unsuccessfully requested copies. In all of the public meetings there was no or barely any room for the answering of neither questions nor discussion. Furthermore, the meetings were held in English and translated extremely poorly, without sufficiently transferring the content of the presentation. These meetings only took place in July, after the Special Authorization had already been issued and the main purpose was to ensure civil society that no harm would come from the proposed bypass, but in fact there was no time or even good will to openly discuss all the questions and concerns presented to date by the civil society groups.

The communication with civil society, in particular with the coalition has been strikingly unsatisfactory, slow and inconsistent. An example of contradictory communication is the inferior impact (only 5-10 instead of 40-100 kilometres) of the substances given by Mozal in one of the public meetings that does not correspond with the data in the EMP.

The coalition has gathered 14809 signatures in a petition to offer to the Mozambican Parliament requesting the immediate cancellation of the Special Authorization until all options to the proposed bypass are fully analysed and discussed with civil society, this petition is still to be submitted. Furthermore the coalition has submitted a legal case to the Administrative Court in Maputo, to request the immediate cancellation of the Administrative Act, the Special Authorization considering the obscure and secret environment in which it was issued. Both processes are still ongoing.

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