

**PROJECT INFORMATION DOCUMENT (PID)
APPRAISAL STAGE**

Report No.: PIDA83869

Project Name	Zambia - Mining and Environmental Remediation and Improvement Project (P154683)
Region	AFRICA
Country	Zambia
Lending Instrument	Investment Project Financing
Project ID	P154683
Borrower(s)	Ministry of Finance, Republic of Zambia
Implementing Agency	Ministry of Mines, Energy and Water Development
Environmental Category	A-Full Assessment
Date PID Prepared/Updated	03-Aug-2016
Date PID Approved/Disclosed	16-Sep-2016
Estimated Date of Appraisal Completion	30-Sep-2016
Estimated Date of Board Approval	16-Dec-2016
Appraisal Review Decision (from Decision Note)	The CMU has given the clearance for project Appraisal and advised the team to plan two project processing scenarios, in light of the upcoming elections (taking into account a possibility of the second round of elections). The Board date is planned for December 2016, and Appraisal Mission could be held at the end of August or end of September depending on the outcomes of the elections.

I. Project Context
Country Context

Zambia is rich in minerals, but suffers from the classic paradox of plenty -- with its wealth of resources not translating into human development. Zambia is a vast landlocked country of 752,600 km² located in southern Sub-Saharan Africa, of which approximately 56 percent is arable land (42 million hectares). The current population of 14.5 million (World Bank, 2013) is predominantly rural (61%) and expected to double by 2030. Zambia's economy is heavily dependent on natural resources, and the mining sector has been a prime mover of economic development for over 70 years, with exports of mineral products contributing about 70 percent of total foreign exchange earnings. Despite the rapid economic growth over the past decade due to expansion of the copper mining industry and agriculture diversification, Zambia has 60 percent of the population living below the poverty line and 4 percent considered to be in extreme poverty. Widespread poverty, mainly caused by fast population growth and systemic youth unemployment, remains Zambia's main economic challenge and it ranks 139th out of 188 countries in the UN Human Development Index for 2014. Real GDP grew annually on average by 7.5% in the decade from 2004-14, whereas

employment is estimated by the ILO to have grown annually by only 3.1% on average.

While mining continues to be the driver of economic growth, copper production has been the backbone of the country's economy. Historically, the performance of the Zambian economy has closely followed the fortunes of copper mining. A combination of prudent macroeconomic management, market liberalization policies, and steep increase in copper prices helped drive investments in the copper industry and related infrastructure to achieve an average annual growth of about 6.4% during the last decade. Agriculture exports have grown at 27% per annum since 2000 and agro-based products were half of Zambia's non-mining exports from 2008-14. The manufacturing sector accounts for about 11 percent of the country's GDP, largely driven by the agro processing (food and beverages), textiles and leather and has been growing at an average annual growth rate of 3 percent in the last five years. Gross Domestic Product (GDP) has declined from 6.7% in 2013 to an estimated 3% in 2015 (compared to 4.9% in 2014) following a six-year low in copper prices, increasing power outages, and El Nino-related poor harvests. Growth is expected to remain around 3% in 2016, subject to the 2016 harvest, the mining industry's reaction to softer copper prices, and stabilization of the power situation. Rapid growth has been fast enough to create enough jobs, but poverty is rising, with employment growth rate at only 3.1 percent even during the period of rapid economic growth (2000-2010). Agriculture remains the main source of employment in all Provinces outside of Lusaka and Copperbelt, although young people in particular seem to be leaving agriculture, but are also more likely to be out of the labor force.

However a Resource-Paradox exists in Zambia. Although copper is the main driver of the economy, the agriculture sector remains a major employer (70% of the population) since, although copper mining produces economic (GDP) stimulus, export earnings and tax revenues, the sector is capital intensive and not job intensive. With many capital and operating inputs being imported, this limits the income distribution potential of the sector. Furthermore, Zambia faces an inter- and intra-generational trade-off between decades-old deflected costs arising from poor enforcement of environmental regulations and a skewed allocation of social costs and benefits of mining as manifested in the high cost of disease burden and its disproportionate impact on the poor. It faces a challenge in managing the trade-off between the positive externalities of mining sector development (including economic growth, employment and revenue generation) versus the unaddressed negative externalities which include but are not limited to environmental damage (land degradation, contamination of land and water and air pollution) and the subsequent environmental health and socioeconomic cost (health hazards, relocation, alcoholism, alteration of the social structure etc.).

Sectoral and institutional Context

The mining sector is a major contributor to Zambia's economic growth. Zambia has a long mining history spanning over 90 years and in the late 1960s, Zambia held the position of the world's third largest copper producer. The Government of Zambia (GRZ) gained control of the copper mines shortly after independence and created the state-owned enterprise Zambia Consolidated Copper Mines (ZCCM) in 1982. As a result of dropping copper prices and underinvestment to maintain levels of production the GRZ decided to implement a comprehensive economic restructuring program aimed at promoting private sector-led development in order to boost and make the mining sector viable. Privatization of the mines was completed in 2000 with ZCCM assets being sold to private investors and ZCCM was transformed into an investment holding company, ZCCM-IH. ZCCM's privatization was expected to mark a turning point in

Zambia's economic reform, providing the basis for reinvestment in the sector and sustained employment, improved environmental management, economic stability and growth. As part of the privatization process GRZ made the strategic choice to retain responsibility for a wide range of environmental liabilities that had accrued from over 70 years of mining activity, and ZCCM, and subsequently ZCCM-IH was burdened with the responsibility to house these enormous environmental liabilities. Following privatization in 2000 and partly due to the significant increases in commodity prices in the ten years leading up to 2011, and in line with the new Mine and Minerals Act, ZCCM-IH has been successful in passing ownership of unused tailings dumps onto new private investors, who saw potential commercial value.

A long history of mining has left a legacy of environmental liabilities in mining towns. Seventy years of mining operations, no formal mine closures, and a lack of concurrent rehabilitation of mining sites has resulted in a massive environmental mortgage. At the time of privatization, commodity prices were still low and private investors were unwilling to accept legal responsibility for such historical environmental liabilities, given both the extent, seriousness and, in some instances, unquantifiable nature of mining-related environmental and public health liabilities. Due in part to a lack of a detailed environmental and social baseline study for each mine site at the time of privatization, the old (pre-privatization) and new (post-privatization) environmental liabilities are now often inseparably mixed, particularly where liabilities extend beyond the boundaries of mineral licenses. With regards to the tailings dumps that contain low contents of metal, many of the new owners hoped for increased prices to make them economically feasible and so postponed final reclamation of the sites. Due to fluctuating copper prices and low metal content in the tailings, none of the new owners have started reprocessing tailings, resulting in ongoing environmental health liabilities and exposures to the local communities. Many of liabilities and risks have now increased due to natural deterioration (e.g. of tailing dams in Kitwe due to poor maintenance or residential encroachment), poor development decisions (e.g. permitting residential development on known contaminated land in Kabwe) or increased environmental standards. The public health risks fall disproportionately on the poor and the vulnerable population, in particular on the children, who are continually exposed to toxic pollution and live in poor, degraded and abandoned mining areas, with lack of access to proper diagnostics, care and treatment.

Private investors are not alone in failing to reclaim mining sites. Liabilities that were retained by ZCCM-IH as part of privatization have also continued to increase in size and affect public health and safety. However, ZCCM-IH has not been as profitable following privatization as it was hoped. The company receives few dividends from its mining investments. As a publicly listed private firm, ZCCM-IH also has a profit maximizing motive and those dividends that it does receive are either passed onto shareholders, 60% of which is the Government of Zambia, or reinvested in high yield opportunities. ZCCM-IH continues to maintain many of the legacy mining sites it was saddled with as part of the privatization, however, sites have yet to be formally closed.

Mining is likely to continue to be important for Zambia in the future and unless something changes, the past is likely to repeat itself. Zambia has a long history of mining, a large known resource base of copper and other deposits, and good potential for further discoveries. Although copper production in Zambia (its main mining product) is generally high cost compared to other countries, the overall economic environment is generally favorable and the overall political environment is satisfactory making Zambia an attractive mining location. This provides good reason for further positive contribution from the sector, however, unless the existing system of mining-environmental

governance changes, the environmental mortgage, social and human health impacts associated with mining will continue to increase.

The high potential for continued mining combined with policy and capacity weaknesses poses a serious risk. Many mining companies are not compliant with the requirements of the environmental protection fund (EPF), the current financial surety mechanism to ensure funding is in place to close mines if a company fails to be able to do so. Concurrent rehabilitation of mining sites is also generally not taking place partly because some investors are hopeful that the low concentrations of metal that remain in tailing dumps could be economically feasible one day with the right prices and right technology. License holders want to maximize the option value associated with the tailings dams in the future and since there is very little cost to an investor to hold a mining license, and since enforcement of environmental regulation is weak, license holders perpetually defer remediation of old tailings dumps and mining sites. Development of the tailings dams is seen as an opportunity to create much needed jobs, and so the preservation of the option value has political backing.

The risk of idle tailings dumps becoming eventual liability of the state has been increasing. Incentives exist for large mining companies to sell or assign the liabilities associated with the tailings dams to new and smaller speculative investors who are attracted to the option value, but yet have less ability to assess the true value or cost of the tailings dams than the large mining companies. As there is no requirement to ensure full compliance with the EPF prior to effecting the transfer of a mining license, large environmental liabilities find themselves being transferred from large mining companies, with financial capacity to remediate the sites properly, to small speculative investors who lack financial capacity to adequately remediate the sites. If prices or technology do not improve to a point where economic extraction of the tailings dumps is feasible, the responsibility to remediate the tailings dumps will eventually be transferred to the state. Without having the funds to address the liabilities provided for in the EPF, the environmental liability will remain unaddressed until financial resources are made available. Until that time, these sites will continue to have an increasing cumulative negative effect on the environment and pose human health and safety risks.

A number of serious environmental impacts are directly linked to copper and lead mining operations in the Copperbelt and Kabwe. Copper smelters have been responsible for substantial amounts of Sulfur Dioxide (SO₂) emissions into the atmosphere, which have caused acid rain, soil erosion, crop damage and air and water pollution. Most of the Copperbelt has 50 times higher concentrations of copper in surface soil than in subsurface samples, while SO₂ concentrations in the air range between 500 and 1000 µg/m³, well exceeding the Zambian guideline of 50 µg/m³. The Kafue River has shown highly elevated concentrations (<0.45 µm) of dissolved copper and cobalt within the mining areas. Leaves and roots of cassava and sweet potato grown in the contaminated areas of the Copperbelt contain elevated metal concentrations, while backyard vegetable gardens are affected by necrosis due to accumulation of heavy metals in the soil and SO₂ on plant leaves. The contamination from ongoing mining operations, is further aggravated by wind-borne dust particles (from dry tailing dams) resulting in accumulation of metals (copper and cobalt and other elements) in soil.

The old mining town of Kabwe has shown unacceptable high levels of lead in the soil due to past lead mining in the area. While the closure of several old lead smelters and mining operation in 1994

resulted in loss of employment and income generation opportunities, it also left an unattended legacy of unhealthy environment in certain parts of Kabwe. The content of lead in soil in certain areas is as high as 26,000 mg/kg in most polluted areas and generally land up to 14 km from Kabwe has been found to be unsuitable for agricultural purposes. Studies done in 2003-2006 found median concentrations of lead in catchment areas of Kabwe Kasanda (3008 mg/kg), Makandanyama (1613 mg/kg), Chowa (1233 mg/kg), Mutwe Wansofu (1148 mg/kg), Makululu (870 mg/kg) and Luangwa (507 mg/kg) all exceeding recommended levels for residential areas (< 400 ppm). The residual environmental health problems in Kabwe are serious due to such widespread lead contamination. It is estimated that tens of thousands of residents (including more than 3,000 children) may be affected by high lead levels in the soil, both from naturally occurring mineralization and the impact of the smelting and reprocessing of existing tailings. The figure below shows interpolated distribution of lead in soil in Kabwe based on a baseline survey done as part of the Bank financed CEP.

More recent data from 2015 shows that the situation in Kabwe has not changed in the last 5 years. The townships next to the mining areas still have lead levels in soil. Surface soil lead concentrations ranged from 139 mg/kg to 62,142 mg/kg, with a geometric mean concentration of 1470 mg/kg. Of the 339 soil tests, 86 readings (25.4%) showed concentration more than 400 ppm. Data show that in one affected residential area, Chowa, the lead contamination differs from compound to compound considerably (400-5000 mg/Kg), possibly due to different contamination levels, e.g. use of contaminated soils indoors/outdoors, and/or different past remediation. The dominant exposure pathway for lead has been found to be airborne and from direct ingestion of soil and dust, with extended pathways through groundwater or surface water and irrigated crops. A study done in 2013 indicated mean concentrations of lead and cadmium in tissues of free-range chickens exceeded maximum recommended levels for human consumption in contrast to lower levels in commercial broiler chickens. Atmospheric lead pollution has been found to be a major contaminator of food crops in Kabwe, particularly maize, which is the primary staple food crop grown in backyards.

High lead concentration in soil is reflected in high Blood Lead Levels (BLLs) of Kabwe residents. The pathways of lead exposure are mainly ingestion of lead contaminated soil or food, but also inhalation and penetration through the skin, causing acute and chronic intoxication. Lead is a silent killer, which results in non-specific clinical conditions such as abdominal pains, neurological symptoms, seizures, anemia, headaches etc. While there is lack of systematic data on health impacts, local health officials in four critically contaminated catchment areas in Kabwe reported high numbers of such clinical conditions, especially in children below 15 years. Many of liabilities and risks have now increased due to natural deterioration (e.g. of tailing dams in Kitwe due to poor maintenance or residential encroachment), poor development decisions (e.g. permitting residential development on known contaminated land in Kabwe) or increased environmental standards.

From a policy perspective, Government has been active, but with a primary focus on revenue generation. In 1998, the Mines and Minerals Regulation that gives effect to the Environmental Protection Fund (Special Instrument No.102) was enacted. Its objective has been to assure that mine developers execute their environmental impact statement and mine closure plans in accordance with the Mines and Minerals (Environmental) Regulations 1997, and to assure that funds for the rehabilitation of mining areas are available if the holder of a mining license fails to be able to rehabilitate the area. In an effort to rebalance the distribution of benefits from mining following privatization, the 1995 Mines and Minerals Act was replaced by the Mines and Minerals

Development Act No. 7 of 2008, whose main feature was the removal of the development agreements that underpinned the privatization, and an increase in mineral royalty tax from 0.3% to 3%. The rebalancing of financial benefits continued as commodity prices increased through several changes to the mining fiscal regime through to 2016. The Mines and Minerals Development Act No. 7 of 2008 was then ultimately replaced by the Mines and Minerals Development Act No. 15 of 2015, whose features among others include the introduction of honorary inspectors to strengthen the enforcement of the Act and its subsidiary regulations. As the above summary highlights, much of the focus on mining in Zambia has been on its revenue generating potential. This has been reinforced by donor support whose projects focus on tax collection both with respect to policy and administration with few large projects addressing the environment, health and public safety issues related to the mining sector.

The World Bank financed Copperbelt Environment Project (CEP) (2003-2011), attempted to address some of the environmental health risks. The project was designed to demonstrate an approach to address environmental liabilities which were seen to be an impediment to future investments in the sector. In Kabwe, which was the focus of much of the CEP's activity, the GRZ acquired experience in implementing activities aimed at treating children with elevated lead levels, regular blood lead level testing and preventing recontamination by reducing lead exposure through environmental and behavior modification. Exposure to harmful substances was significantly reduced through the removal and proper disposal of hazardous materials from mine sites, such as 150,000 cubic meters of radioactive uranium tailings, about 220 tons of PCBs, and 56,000 m³ of lead contaminated soils in Copperbelt and Kabwe, as well as extensive demolition, cleanup and re-vegetation efforts. In addition, four tailings dams and two overburden dumps were repaired and their potential health and environmental risks reduced. The integrated case management (ICM) program resulted in a reduction of blood lead levels in 2,822 children (out of 5,000 children tested) by between 20-25 percent in the case of treatment with nutritional supplements (for children with blood lead levels between 20-64 micrograms per deciliter) and by up to 74 percent for chelation treatment (for children with blood lead levels beyond 65 micrograms per deciliter). The CEP also supported some policy achievements including the promulgation of the Environmental Management Act of 2011 and the Establishment of an Environmental Protection Fund (EPF) which a) provides assurance to the Mines Safety Department (MSD) that a licensee or permit holder under the Mines and Minerals Act shall execute the Environmental Impact Statement (EIA; and b) provides protection to the GRZ against the risk of having the obligation to undertake the rehabilitation of a mining area where the holder of a mining license fails to do so. However, upon closure of CEP in 2011, the EPF was still not fully operationalized which led GRZ to face tremendous challenge in continuing the mitigation and remediation activities due to lack of resources and capacity of the local levels.

GRZ recognizes that several measures undertaken by the CEP are replicable and scalable. These measures include remediation of contaminated sites and rehabilitation of tailings dams which pose significant environmental health risks to downstream communities in 4 municipalities, disposal of hazardous materials and institutional strengthening. The absence of continued GRZ engagement has led to deterioration of environmental health situation in the old mining areas, resulting in increased cases of acute lead poisoning among children and loss of agricultural productivity. There is also noticeable increase in exposure to hazardous mining waste of the youth and women, due to high levels of unemployment and unfettered access to idle mining sites.

GRZ recognizes that the World Bank can bring in vast expertise and experience in strengthening

technical and institutional approaches, including improved public accountability and delineation of responsibility about risks and liabilities. There is an opportunity to strengthen and empower communities to demand better environmental quality while improving alternative livelihood opportunities. In addition to remediation of some of the known hotspots of toxic contamination in Kabwe and Copperbelt area, there is significant room to improve and further enhance the institutional capacity to monitor and enforce environmental and mining regulations and standards. There is an opportunity to undertake targeted interventions in Kabwe and Copperbelt province which would help reduce the exposure of local communities to toxic pollutants.

II. Proposed Development Objectives

To reduce environmental health risks including lead exposure to the local population in critically polluted mining areas in Kabwe, Kitwe, Mufulira and Chingola municipalities

III. Project Description

Component Name

Remediation of Contaminated Hotspots and Improvement of Environmental Infrastructure

Comments (optional)

Component Name

Enhancing Institutional capacity to strengthen environmental governance and compliance

Comments (optional)

Component Name

Reducing environmental health risks through localized interventions

Comments (optional)

Component Name

Project Management, Monitoring and Evaluation

Comments (optional)

IV. Financing (in USD Million)

Total Project Cost:	55.60	Total Bank Financing:	55.60
Financing Gap:	0.00		
For Loans/Credits/Others			Amount
International Development Association (IDA)			55.60
Total			55.60

V. Implementation

The project will be implemented by the Ministry of Mines (MoM) in collaboration with the Ministry of Lands, Natural Resources and Environmental Protection (MLNREP), Ministry of Health (MOH), Ministry of Local Government and Housing (MLGH) and ZCCM-IH. The MoM has established a Project Steering Committee (PSC) chaired by the Permanent Secretary of Mines. The PSC

comprises the Permanent Secretaries of Ministry of Finance, MLNREP, MOH, MLGH, Central Province, as well as Director General (DG) of ZEMA and ZCCM-IH. A Project Coordination Unit (PCU) has been established at the MoM with a designated Project Coordinator. For the purposes of implementation, three Project Implementation Units (PIUs) with Designated Project Accounts, would be set up at MSD, ZEMA and Kabwe Municipal Council (KMC), who would be responsible for planning, procurement, implementation and monitoring of various activities. The PSC will be mainly responsible for approval of Annual Plans submitted by the PIUs and consolidated by the PCU. The PCU will act as the technical Secretariat for the PSC. A Project Management Consultant (PMC) will provide implementation support to the PCU and PIUs. Specifically PIUs will be responsible for: (a) preparation of procurement plans and the management of the designated accounts; (b) accounting, financial management and reporting on the overall project sub-components; (c) ensuring the execution of the audit of the project; (d) preparation of quarterly financial and technical progress reports; (e) the management of the environmental and social safeguards aspects; and (f) undertaking all procurement and contract management activities for all components. The PCU will have no direct line authority over the PIUs – instead, its role is mainly to facilitate the aggregation of PIU activity for reporting to the World Bank and the PSC and provide services to the PIUs where certain skills may need to be centralized and shared across PIUs.

VI. Safeguard Policies (including public consultation)

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	x	
Natural Habitats OP/BP 4.04		x
Forests OP/BP 4.36		x
Pest Management OP 4.09		x
Physical Cultural Resources OP/BP 4.11	x	
Indigenous Peoples OP/BP 4.10		x
Involuntary Resettlement OP/BP 4.12	x	
Safety of Dams OP/BP 4.37		x
Projects on International Waterways OP/BP 7.50		x
Projects in Disputed Areas OP/BP 7.60		x

Comments (optional)

OP/BP 4.01 has been triggered and overall, the program has an environmental category A. However, most interventions under the project are not likely to result in significant environmental, health or social impacts as they will be designed to reduce environmental health impacts, and address the source of the impact. During the project preparation the following policies were confirmed to be applicable to the project: OP 4.01 Environmental Assessment, OP 4.12 Involuntary Resettlement and OP 4.11 Physical Cultural Resources.

The type of sub-project activities that might cause significant adverse impacts, proposed for funding in the second year of the project include: (a) the closure or rehabilitation of tailing dams and remediation of contaminated hotspots; (b) development of a solid and hazardous waste disposal facility in Kabwe; and (c) improving the drainage and flow of Kabwe canal to reduce the risks of flooding in the neighboring community. Based on the application of the procedures outlined in the ESMF and RPF, site specific ESIA/ESMP, and, if required, RAP will be prepared for all sub projects based on the screening, and publicly disclosed, prior to finalization of the design and commencement of construction. During subproject preparation, the project implementing teams will

use an opportunity to use the ESIA/ESMP findings to further improve project designs and minimize adverse impacts while maximizing positive impact on people and environment.

Safeguards approach: Since the exact locations and site specific details of the activities and scope of works are not yet identified, the relevant safeguards instrument at appraisal stage is an Environmental and Social Management Framework (ESMF). The ESMF provides detailed step-by-step processes for identification and screening of critical environment and social risks; procedures for evaluation of significance of environmental risks and impacts; development of site specific mitigation and monitoring plan when subproject details are identified; and institutional arrangement for safeguards implementation and capacity building measures. The ESMF provides guidelines for the development of ESIA's and ESMPs that will present mitigation measures to address the potential environmental and social impacts of the Project at the subproject level, once the activities location and scope have been identified.

Inclusion of vulnerable groups: The selected municipalities have already implemented a number of initiatives targeting groups such as women headed households, elderly, disabled and youth. The project will provide special attention to these groups with dedicated grant opportunities under Subcomponent 3.2 and targeted sensitization and education campaigns.

Avoiding land acquisition and Involuntary Resettlement through project design: The proposed project activities do not include building any major infrastructure that may require displacement or involuntary land taking. The nature, scope and design of the project interventions provide an opportunity to avoid involuntary resettlement and land acquisition. The project however triggers OP/BP 4.12 for a possibility that there may be temporary impacts on livelihoods due to restriction of access under Component 1 or Component 3, such as closing and rehabilitation of tailing dams, community driven income generation projects; or as part of voluntary in-situ remediation program for backyards of households in contaminated areas, based on voluntary participation by house owners. A Resettlement Policy Framework (RPF) has been prepared, consulted upon, and disclosed prior to project Appraisal. The RPF will guide the development of site specific Resettlement Action Plans, which will be developed as needed during project implementation. The RPF also provides detailed guidelines on processes for undertaking, documenting, and keeping records of voluntary land donations, if any.

VII. Contact point

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