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Report No: PAD 1513

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

ON A

PROPOSED CREDIT

IN THE AMOUNT OF SDR 47.8 MILLION
(US$65.6 MILLION EQUIVALENT)

TO THE

REPUBLIC OF ZAMBIA

FOR A

MINING AND ENVIRONMENTAL REMEDIATION AND IMPROVEMENT PROJECT

November 23, 2016

Environment and Natural Resources Global Practice
Africa Region

CURRENCY EQUIVALENTS
(Exchange Rate Effective October 31, 2016)

Currency Unit	=	SDR
US$1	=	SDR 0.72788150
SDR 1	=	US$1.37

FISCAL YEAR
January 1 – December 31

ABBREVIATIONS AND ACRONYMS

BLL	Blood Lead Levels
CBE	Community Based Enterprises
CDC	Center for Disease Control
CEP	Copperbelt Environment Project
CEMS	Central Environmental Management System
CPS	Country Partnership Strategy
CSO	Civil Society Organization
CQS	Consultant's Qualifications based Selection
DPSC	District Planning Sub Committee
DMO	District Medical Office
EITI	Extractive Industries Transparency Initiative
EMA	Environmental Management Act
EPF	Environmental Protection Fund
ERR	Economic Rate of Return
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
FDI	Foreign Direct Investments
FM	Financial Management
GDP	Gross Domestic Product
GRM	Grievance Redress Mechanism
GRS	Grievance Redress Service
GRZ	Government of Republic of Zambia
ICB	International Competitive Bidding
ICM	Integrated Case Management
ICR	Implementation Completion Report
IDA	International Development Association
IEC	Information, Education and Communication
IEG	Independent Evaluation Group
IFMIS	Integrated Financial Management Information System
IFRs	Interim Financial Reports
IQ	Intelligence Quotient
IPSAS	International Public Sector Accounting Standards
LCS	Least-Cost Selection
M&E	Monitoring and Evaluation

MMMD	Ministry of Mines and Mineral Development
MMDA	Mines and Minerals Development Act
MLNREP	Ministry of Lands, Natural Resources and Environmental Protection
MLGH	Ministry of Local Government and Housing
MOH	Ministry of Health
MSD	Mines Safety Department
NCB	National Competitive Bidding
NPV	Net Present Value
OAG	Office of the Auditor General
KMC	Kabwe Municipal Council
PAD	Project Appraisal Document
PCU	Project Coordination Unit
PDO	Project Development Objectives
PIU	Project Implementation Unit
PIM	Project Implementation Manual
PMC	Project Management Consultants
PMO	Provincial Medical Office
PSC	Project Steering Committee
QBS	Quality-Based Selection
RAP	Resettlement Action Plan
RPA	Radiation Protection Authority
RPF	Resettlement Policy Framework
SOE	Statement of Expenditure
SO_2	Sulfur Dioxide
SDR	Special Drawing Rights
TD	Tailings Dam
USEPA	United States Environmental Protection Agency
WB	World Bank
WBG	World Bank Group
WHO	World Health Organization
ZAMRA	Zambia Medicines Regulatory Authority
ZCCM-IH	Zambia Consolidated Copper Mines – Investment Holdings
ZEMA	Zambia Environmental Management Authority
ZMERIP	Zambia Mining and Environment Remediation and Improvement Project
ZMK	Zambian Kwacha
ZPPA	Zambia Public Procurement Agency

Regional Vice President:	Makhtar Diop
Country Director/Manager:	Ina Ruthenberg
Senior Global Practice Director:	Julia Bucknall
Practice Manager:	Magda Lovei
Task Team Leader (s):	Sanjay Srivastava/Martin Lokanc

COUNTRY

Zambia - Mining and Environmental Remediation and Improvement Project (P154683)

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PAD DATA SHEET

Zambia

Mining and Environmental Remediation and Improvement Project (P154683)

PROJECT APPRAISAL DOCUMENT

AFRICA

0000009270

Report No.: PAD1513

Basic Information			
Project ID P154683	EA Category A - Full Assessment		Team Leader(s) Sanjay Srivastava/Martin Lokanc
Lending Instrument Investment Project Financing	Fragile and/or Capacity Constraints [ ] Financial Intermediaries [ ] Series of Projects [ ]		
Project Implementation Start Date December 16, 2016	Project Implementation End Date June 30, 2022		
Expected Effectiveness Date May 31, 2017	Expected Closing Date June 30, 2022		
Joint IFC No			
Practice Manager/Manager Magda Lovei	Senior Global Practice Director Julia Bucknall	Country Director Ina Ruthenberg	Regional Vice President Makhtar Diop

Borrower: REPUBLIC OF ZAMBIA			
Responsible Agency: Ministry of Mines and Mineral Development			
Contact:	Mr. Paul Chanda	Title:	Permanent Secretary
Telephone No.:	260-211-235-329	Email:	mbotwapm@yahoo.com

Project Financing Data(in USD Million)					
[ ]	Loan	[ ]	IDA Grant	[ ]	Guarantee
[X]	Credit	[ ]	Grant	[ ]	Other

Total Project Cost:	65.60	Total Bank Financing:	65.60
Financing Gap:	0.00		

Financing Source	Amount
International Development Association (IDA)	65.60
Total	65.60

Expected Disbursements (in US$, million)

Fiscal Year	2017	2018	2019	2020	2021	2022				
Annual	5.00	10.00	10.00	15.60	15.00	10.00				
Cumulative	5.00	15.00	25.00	40.60	55.60	65.60				

Institutional Data

Practice Area (Lead)

Environment & Natural Resources

Contributing Practice Areas

Energy & Extractives, Trade & Competitiveness, Social, Urban, Rural and Resilience Global Practice

Proposed Development Objective(s)

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

Components

Component Name	Cost (US$, millions)
Remediation of Contaminated Hotspots and Improvement of Environmental Infrastructure	29.60
Enhancing Institutional Capacity for Environmental Governance and Compliance	13.50
Reducing environmental health risks through localized interventions	18.50
Project Management, Monitoring and Evaluation	4.00

Systematic Operations Risk- Rating Tool (SORT)

Risk Category	Rating
1. Political and Governance	Moderate
2. Macroeconomic	High
3. Sector Strategies and Policies	Substantial
4. Technical Design of Project or Program	Moderate
5. Institutional Capacity for Implementation and Sustainability	Substantial
6. Fiduciary	Moderate

7. Environment and Social	Substantial
8. Stakeholders	Substantial
OVERALL	**Substantial**

Compliance

Policy

Does the project depart from the CAS in content or in other significant respects?	Yes [ ] No [X]
Does the project require any waivers of Bank policies?	Yes [ ] No [X]
Have these been approved by Bank management?	Yes [ ] No [ ]
Is approval for any policy waiver sought from the Board?	Yes [ ] No [X]
Does the project meet the Regional criteria for readiness for implementation?	Yes [X] No [ ]

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**

Legal Covenants

Name	Recurrent	Due Date	Frequency
Project Implementation Agreement with each of the municipalities		May 31, 2017	

Description of Covenant

Schedule 2, Section I. D1. For the purposes of implementing Part 3.2 of the Project by Chingola, Kitwe and Mufulira Municipalities, the Recipient shall provide financing to the Chingola, Kitwe and Mufulira Municipalities, and enter into a Project Implementation Agreement each of the municipalities For purposes of implementing Part 2.1 of the Project by Radiation Protection Authority (RPA), the Recipient shall enter into a Project Implementation Agreement with RPA.

Legal Covenants

Name	Recurrent	Due Date	Frequency
Annual Audit	X		Yearly

Description of Covenant
Section II B (3). The recipient shall ensure and cause each project implementation entity to have its financial statement audited in accordance with the provision of section 4.09 (b) of the general conditions.

Legal Covenants

Name	Recurrent	Due Date	Frequency
Selection of Beneficiaries and Sub-projects	X		Yearly

Description of Covenant
Section I. E 1. For purposes of carrying out the Sub-projects under Part 3.2(a) of the Project, the Recipient shall select Beneficiaries and Sub-projects in accordance with the criteria, conditions and procedures set out in the Project Implementation Manual and enter into a Sub-project Grant Agreement with the Beneficiary.

Conditions

Source Of Fund	Name	Type
IDA	Signing of Subsidiary Agreements	Effectiveness

Description of Condition

- Financing Agreement 5.01(a) and 5.02 – The Subsidiary Agreement has been executed on the behalf of the Recipient and KMC, and a legal opinion has been issued; and
- Financing Agreement 5.01 (b) and 5.02 - The Subsidiary Agreement has been executed on the behalf of the Recipient and ZEMA, and a legal opinion has been issued.

Source Of Fund	Name	Type
IDA	Retroactive Financing	Disbursement

- Financing Agreement 4 A 1 –Recipient may withdraw the proceeds of the Credit in accordance with the provisions of Article II of the General Conditions. Project activities costing a total amount of up to US$500,000 are eligible for retroactive financing

Team Composition

Bank Staff

Name	Role	Title	Specialization	Unit
Sanjay Srivastava	Team Leader (ADM Responsible)	Lead Environmental Specialist	Environmental Remediation	GEN01
Wedex Ilunga	Procurement Specialist (ADM Responsible)	Senior Procurement Specialist	Procurement	GGO01
Lingson Chikoti	FM Specialist	Consultant	Financial Management	GGOPS
Iretomiwa Olatunji	Team Member	Environmental Specialist	Operations	GEN01
John Bosco Makumba	Team Member	Senior Operations Officer	Health	GHN01

Kaori Oshima	Team Member	Social Development Specialist	Livelihood	GSUGL
Knut Opsal	Safeguards Specialist	Lead Social Development Specialist	Social Safeguards	GSU07
Martin Lokanc	Co Team Leader	Senior Mining Spec.	Mining Policy	GEEX2
Ruma Tavorath	Team Member	Environmental Specialist	Environmental Health	GEN07
Mwansa Lukwesa	Safeguards Specialist	Environmental Specialist	Environmental safeguards	GEN01
Margaret Png	Lawyer	Lead Counsel	Legal	LEGAM
Svetlana Khvostova	Safeguards Specialist	Natural Resources Mgmt. Spec.	Environmental Safeguards and M&E	GEN01
Wisdom E. Mulenga	Team Member	Team Assistant	Program Assistant	AFMZM
Chrissie Kamwendo	Team Member	Senior Operations Officer	Operations	AFMZM
Carlyn Hambuba	Team Member	Communications associate	Communications	AFREC
Maiada Mahmoud Abdel Fattah Kassem	Disbursements	Finance Officer	Loan Operations	WFALA

Extended Team

Name	Title	Office Phone	Location
Stephan Bose O'Reilly	Consultant – Pediatrician	+49-89-440057687	Munich, Germany
Elena Strukova	Consultant – Economist	703-560-2614	USA

Locations

Country	First Admin. Division	Location	Planned	Actual	Comments
Zambia	Central	Kabwe	X		
Zambia	Copperbelt	Kitwe, Mufulira and Chingola	X		

Consultants (Will be disclosed in the Monthly Operational Summary)

Consultants Required?	Consultants will be required

I. STRATEGIC CONTEXT

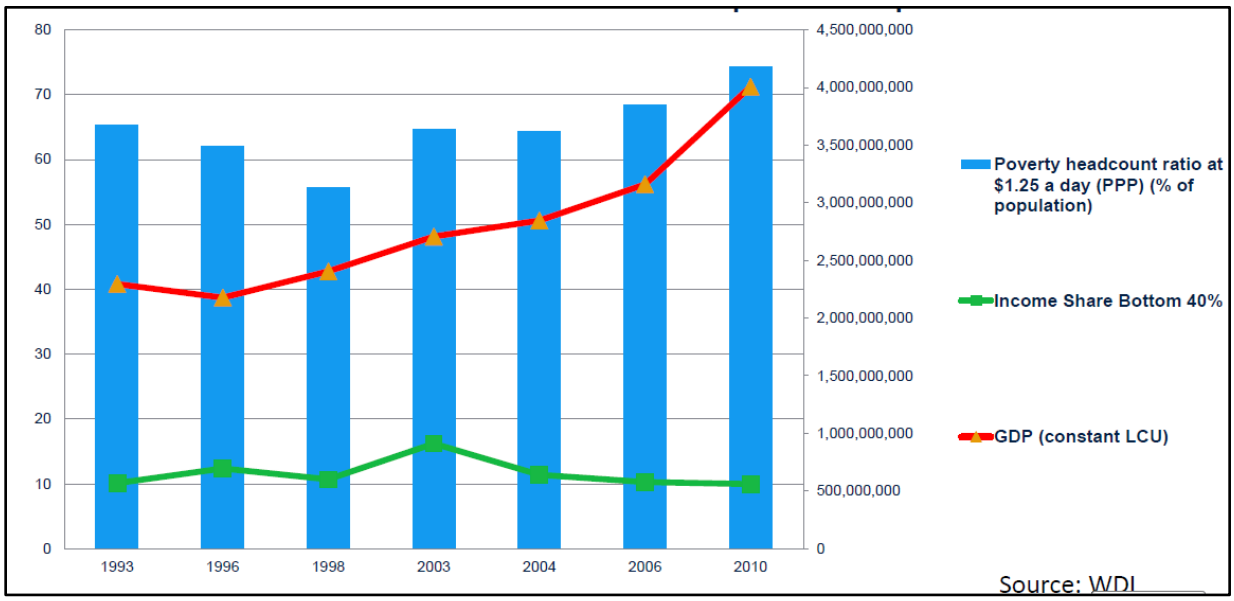
A. Country Context

1. **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 km^2 located in southern Sub-Saharan Africa, of which approximately 56 percent is arable land (42 million hectares). The current population of 15.5 million (World Bank, 2015) is predominantly rural (61 percent) and is expected to double by 2041, at its estimated growth rate of 2.8 percent. 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 between 2004 and 2014, due to the expansion of the copper mining industry and the service sector, 60 percent of the population is living below the poverty line with 42 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 2015. Real Gross Domestic Product (GDP) grew annually on average by 7.4 percent in the decade from 2004-14[1], whereas employment is estimated by the International Labor Organization to have grown annually by only 3.1 percent on average.

2. **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 6.5 percent during the last decade. Agriculture exports have grown at 27 percent per annum since 2000[2] 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.[3] GDP has declined from 6.7 percent in 2013 to an estimated 3 percent in 2015 (compared to 4.9 percent in 2014) following a six-year low in copper prices, increasing power outages, and El Niño-related poor harvests. Growth is expected to remain around 3 percent in 2016, subject to the 2016 harvest, the mining industry's reaction to softer copper prices, and stabilization of the power situation.[4] Rapid growth has been fast enough to create jobs, but poverty is rising, even during the period of rapid economic growth (2000-2010). Agriculture remains the main source of employment in all provinces except Lusaka and Copperbelt, although young people in particular seem to be leaving agriculture, and are also more likely to be out of the labor force.[5]

[1] World Bank (2016) 'Beating the Slowdown: Making Every Kwacha Count, 7th Economic Brief, June 2016, Lusaka.
[2] Promoting Trade and Competiveness: What Can Zambia Do?: World Bank, June 2014.
[3] Zambia Development Agency, 2014.
[4] World Bank Zambia Outlook.
[5] World Bank Zambia Jobs Diagnostic, 2016.

Figure 1: Rapid but Unequal Growth Showing Rising Poverty Headcount Ratio



Source: World Bank Zambia Jobs Diagnostic, 2016

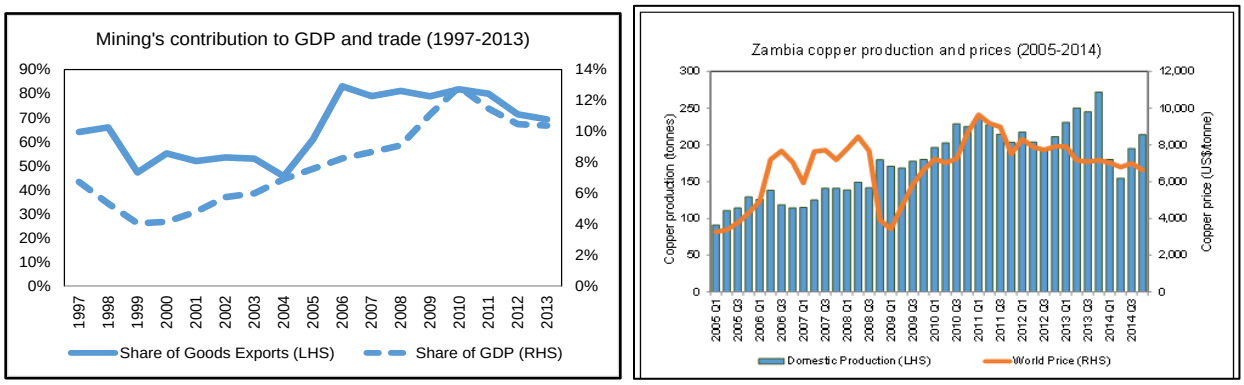
3. **A 'Resource-Paradox' exists in Zambia.** Although copper is the main driver of the economy, the agriculture sector remains a major employer (70 percent of the population) since, despite the fact that copper mining produces economic (GDP) stimulus, export earnings and tax revenues, the sector is 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. The country 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 costs (health hazards, relocation, alcoholism, alteration of the social structure etc.).

B. Sectoral and Institutional Context

4. **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, 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, Zambia Consolidated Copper Mines – Investment Holding (ZCCM-IH). ZCCM's privatization was expected to mark a turning point in Zambia's economic reform process, 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[6] was burdened with the responsibility to house these large environmental liabilities. Following privatization and partly due to the significant increases in commodity prices in the ten years leading up to 2011, and in line with the Mine and Minerals Development Act (MMDA) of 2008, ZCCM-IH has been successful in passing ownership of unused tailings dams[7] (TDs) onto new private investors, who saw potential commercial value in them.

Figure 2: Contributions of the Mining Industry to the Zambian Economy



Source: World Bank Economic Brief: Making Mining Work for Zambia

5. **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 inseparable, particularly where liabilities extend beyond the boundaries of mineral licenses.[8] With regards to the TDs that contain low contents of metal, many of the new owners are waiting 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 the liabilities and risks have now increased due to natural deterioration (e.g. of TDs in Kitwe, Mufulira and Chingola municipalities due to poor maintenance or residential encroachment), poor development decisions

[6] Since the CEP, ZCCM-IH has sold 40% of its equity to private investors. ZCCM-IH is now a publicly traded company that is listed on the Lusaka Stock Exchange, Paris Euronext and London Stock Exchanges under ISIN number ZM0000000034.

[7] TDs are the materials left over after the process of separating the desired/valuable product from the run of the mine ore. TDs are often the most significant environmental liability for a mining project.

[8] Environmental liabilities within license areas are the responsibility of the license holder. Liabilities, like assets, can however, be transferred to another party by agreement. From the GRZ perspective, it would look to the license holder as the responsible party to address environmental liabilities. Where a liability has been transferred through private contract, it is the World Bank's understanding that the license holder is responsible to comply with the environmental provisions of its contract.

(e.g. permitting residential development on known contaminated land in Kabwe[9]) or poor enforcement of 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 limited access to proper diagnostics, care and treatment.

6. **Private investors are not alone in failing to reclaim mining sites.** Liabilities that were retained by ZCCM-IH during the privatization process have also continued to increase in size and affect public health and safety. 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.This is at least partly due to the fact that 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 percent of which is the Government of Zambia, or reinvested in high yield opportunities.

7. **Mining is expected 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 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 a good basis for further positive contribution from the sector, however, unless the existing system of mining-environmental governance changes, the environmental, social and human health impacts associated with mining will continue to increase.

8. **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), which is the current financial surety mechanism to ensure funding is in place to close mines if a company fails to be able to do so[10]. 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 TDs could be economically feasible one day with the right prices and right technology. License holders want to maximize the "option value" associated with the TDs in the future and since there is little cost to an investor to hold a mining license, and since enforcement of environmental regulation is weak, license holders indefinitely defer remediation of old TDs and mining sites. Development of the TDs is seen as an opportunity to create much needed jobs[11], and so the preservation of the "option value" has political backing.

9. **The risk of idle TDs becoming eventual liability of the state has been increasing.** Incentives exist for large mining companies to sell or assign the liabilities associated with the TDs

[9] Kabwe is the second biggest town of Zambia, and Kabwe mine was operating for more than 90 years till completion of extraction in 1994 producing large quantities of lead and zinc.

[10] Reasons for non-compliance vary. In some instances, the cash component is too onerous for marginal and small companies. In others, the requirement to obtain a local Zambian bank guarantee for assessed liability value is not possible due to the large nature of the liabilities and modest size of local banks. The project will seek to address policy barriers to compliance.

[11] Even if the mining and processing of tailings dams is not jobs intensive.

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 TDs 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 TDs is feasible, the responsibility to remediate the TDs 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 surrounding environment and pose human health and safety risks.

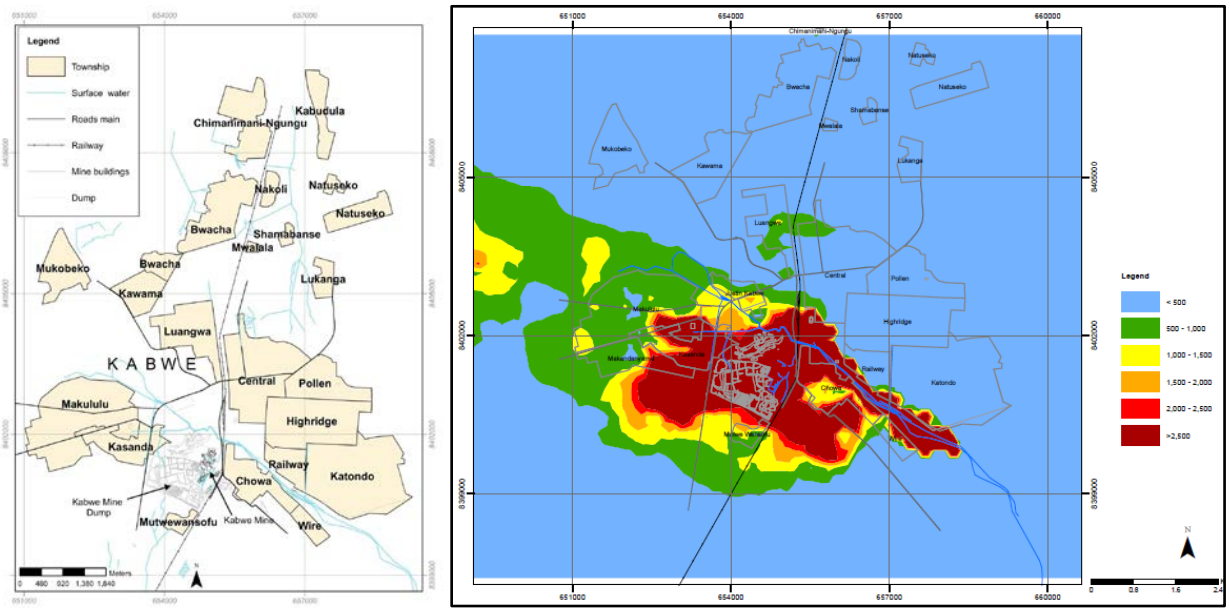
10. **A number of serious environmental impacts are directly linked to past copper mining operations in the Mufulira, Chingola and Kitwe municipalities in Copperbelt Province.** Copper smelters have been responsible for substantial amounts of SO_2 emissions into the atmosphere, which have caused acid 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[12], while SO_2 concentrations in the air range between 500 and 1000 μg/m, well exceeding the Zambian guideline of 50 $\mu g/m^3$.[13] The Kafue River[14] has shown highly elevated concentrations (<0.45 $\mu g/m^3$) 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 are known to contain elevated metal concentrations[15], while backyard vegetable gardens are affected by necrosis[16] due to accumulation of heavy metals in the soil and SO_2 on plant leaves. The contamination from ongoing mining operations, is further aggravated by wind-borne dust particles (from dry TDs) resulting in accumulation of metals (copper and cobalt and other elements) in soil.

11. **The old mining town of Kabwe has shown unacceptably high levels of lead in the soil resulting from 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 town. Due to both naturally occurring mineralization and the impact of the smelting/reprocessing of lead tailings, the lead content[17] in soil in certain areas is as high as 26,000 mg/kg in the most polluted

[12] Air Pollution on the Copperbelt Province of Zambia: Effects of SO_2 on Vegetation and Humans: Ncube et al; School of Mines and Mineral Science, Copperbelt University, 2012.
[13] Towards better environmental management and sustainable exploitation of mineral resources: Joanna Lindahl; Geological Survey of Sweden, July 2014.
[14] The Kafue River is the longest river lying wholly within Zambia at about 1,600 kilometers (990 mi) long. It is Zambia's principal river and is the most central and the most urban. More than 50 percent of Zambia's population live in the Kafue River Basin and of these around 65 percent are urban. In the Copperbelt, water is taken from the river to irrigate small farms and market gardens. At Kitwe it changes course to the south-west and flows through forests and areas of flat rock over which it floods in the wet season, keeping to a channel about 50m wide in the dry season.
[15] Lindahl: Czech Geological Survey 2007.
[16] Necrosis is caused by factors external to the cell or tissue, such as infection, toxins, or trauma which result in the unregulated digestion of cell components. The affected plant tissue usually turns brown to black in color. Necrotic symptoms could appear in any part of the plant such as in storage organs, in green tissues, or in woody tissues.
[17] Lead is a toxic substance and chronic exposure causes serious negative health effects. Main sources of lead exposure are in general: lead from an active industry, such as mining and smelting via contaminated soil; lead contamination as a legacy of

areas (as against USEPA's standard for lead of 400 ppm[18] in play areas and 1200 ppm for non-play areas) and generally land up to 14 km from Kabwe has been found to be unsuitable for agricultural purposes.[19] 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).[20] The residual environmental health problems in Kabwe are serious due to such widespread lead contamination. It is estimated that more than 3,000 children may be affected by high lead levels in the soil. The figure below shows interpolated distribution of lead in soil in Kabwe based on a baseline survey done as part of the earlier World Bank financed Copperbelt Environment Project (CEP).

Figure 3: Distribution of lead contamination in soil in Kabwe Town



12. **More recent data from 2015 shows that the situation in Kabwe has not changed in the last five years**. The catchment areas next to the old mining areas still have high lead levels in the soil. Surface soil lead concentrations ranged from 139 mg/kg to 62,142 mg/kg, with a geometric mean concentration of 1470 mg/kg.[21] Of the 339 soil tests, 86 readings (25.4 percent) showed concentration more than 400 ppm.[22] Data show that in one affected residential area, Chowa, the lead contamination differs considerably from compound to compound (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

historical contamination from former industrial sites via lead contaminated soils; drinking-water systems with lead solder and lead pipes; lead-based paints and pigments; and lead in electronic waste (e-waste).

[18] 1 mg/kg is the same as 1 ppm because 1 milligram is equal to 0.001 grams while 1 kilogram is equal to 1,000 grams.

[19] Lindahl: Czech Geological Survey 2007.

[20] Studies undertaken under the previous Bank funded Copperbelt Environment Project (CEP).

[21] Data compiled from studies undertaken by Japan International Cooperation Agency (JICA) and Blacksmith Institute (2015) in collaboration with University of Lusaka (2014) and Blacksmith Institute (2015).

[22] Lead poisoning in children from townships in the vicinity of a lead–zinc mine in Kabwe, Zambia, Yabe et al, 2014.

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.[23] 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.[24]

13. **High lead concentration in soil is reflected in high Blood Lead Levels (BLLs) of Kabwe residents.** The pathways of lead exposure are mainly through ingestion of lead contaminated soil or food, but also through 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.[25] The BLLs have been found to range on an average from 15 micrograms per deciliter of blood (µg/dL) to 85 µg/dL (as against a World Health Organization (WHO) benchmark of 10 µg/dL and USEPA standard of 5 µg/dL). As per WHO, each 10-20 µg/dl of BLL in children represents about 2 points reduction in IQ levels, thereby posing a significant risk for children in Kabwe.

14. **From a policy perspective, government has been active, but with a primary focus on revenue generation.** An Environmental Protection Fund (EPF) (Special Instrument No.102) was incorporated in the Mines and Minerals (Environmental) Regulations 1998. The EPF, which was operationalized under CEP, was intended to assure that mine developers execute their environmental impact statement and mine closure plans, 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, a new feature was introduced through the Mines and Minerals Development Act (MMDA) No. 7 of 2008: the removal of the Development Agreements[26] that underpinned the privatization, and an increase in mineral royalty tax from 0.3 percent to 3 percent. The rebalancing of financial benefits continued as commodity prices increased through several changes to the mining fiscal regime through to 2016.[27] The MMDA No. 7 of 2008 was replaced by the MMDA 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 focusing 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.

[23] Metal distribution in tissues of free-range chickens near a lead-zinc mine in Kabwe, Zambia. Yabe et al, Jan 2013.
[24] Concentration of some metallic pollutants in the Zambian Environment: Determination of concentration of Cadmium, Copper, Zinc and Lead in soils and vegetation around Kabwe: Backsion Tembo; 1993.
[25] Lead poisoning in children from townships in the vicinity of a lead-zinc mine in Kabwe, Zambia. Data from questionnaires of children from Chowa, Kasanda and Makululu townships: Yabe et al, 2014.
[26] A Development Agreement is a large scale mining license between GRZ and mining companies for financing of mining operations. It includes provisions of the licenses, revenue arrangements, accountability of parties, dispute resolutions arising out of the agreements as well as international arbitration.
[27] Six changes to the mining fiscal regime were introduced since the enactment of the 2008 Mines and Minerals Development Act.

15. **The World Bank financed Copperbelt Environment Project (CEP) (2003-2011), attempted to address some of the environmental health risks.** In Kabwe, which was the focus of much of the CEP's activity, the GRZ acquired experience in implementing interventions 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 PolyChlorinated Biphenyls (PCBs), and 56,000 cubic meters of lead contaminated soils in Copperbelt and Kabwe, as well as extensive demolition, cleanup and re-vegetation efforts. In addition, four TDs and two overburden dumps were repaired and their potential health and environmental risks reduced. The Integrated Case Management (ICM) program[28] 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 actions including the promulgation of the Environmental Management Act of 2011 and the operationalization of the EPF[29] which a) provides assurance to the Mines Safety Department (MSD) that a licensee or permit holder under the MMDA shall execute the Environmental Impact Statement (EIA); and b) provides protection to the government 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.

16. **However, the government recognizes that experience acquired under the CEP needs to be replicated and customized for desired environmental health outcomes.** Upon closure of CEP in 2011, the EPF was still not fully effective which led the government to face significant challenges in continuing the mitigation and remediation activities due to lack of resources and capacity of the local levels. Additionally, lack of continuity of interventions has resulted in continued exposure to toxic pollution and cases of acute lead poisoning among children and loss of agricultural productivity. There is also noticeable risk of exposure to hazardous mining waste of the youth and women, due to high levels of unemployment and unfettered access to idle mining sites.

C. Higher Level Objectives to which the Project Contributes

17. The Zambia Mining and Environmental Remediation and Improvement Project (ZMERIP) is consistent with the long-term development objectives articulated in the National Vision 2030. With the goal "to become a prosperous middle income country by the year 2030", the Vision identifies a number of development goals, which include: (a) reaching middle income status; (b) significantly reducing hunger and poverty; and (c) fostering a competitive and outward-oriented economy. The project also supports GRZ's Sixth National Development Plan (2013-2016) whose

[28] Integrated case management is a method to identify individual lead intoxicated subjects. ICM includes: a) Analysis of blood for lead before and during ICM to identify and follow up exposed subjects; b) Education of individuals and community to reduce personal exposure and prevent re-intoxication; c) Reduce exposure in personal surrounding (remediation of housing areas) and d) Treatment with appropriate medication (anti-chelating agent) and necessary supplements.

[29] The EPF is managed and administered by an Environmental Protection Fund Committee, which consist of four government officials responsible for environmental matters and seven representatives of mining companies. The Director of the Mines Safety Department (MSD) chairs the EPF Committee.

objectives include (a) promoting environmentally friendly technologies for income generation; (b) promoting sustainable land management and facilitate rehabilitation of degraded lands in open areas; (c) improving management of waste, chemicals and effluent; and (d) expanding access to Environmental Health and Food Safety services. Through its implementation structure, the project also builds on the government's new National Decentralization Policy which aims to empower provinces and districts to manage their own affairs for effective socio-economic development. The GRZ's Seventh National Development Plan is expected to provide opportunities to integrate and mainstream sustainable development goals in the national development framework.

18. The project is consistent with the World Bank Group's Country Partnership Strategy (CPS - FY13-16) that aims to help the government address the development challenges in its priority areas identified in the Sixth National Development Plan. Through its environmental health interventions, the project will directly contribute to CPS Outcome 1.2 "Improved access to resources for strengthening household resilience and health in targeted areas". CPS outcomes that have been outlined in this project on 'Strengthened Systems and Processes for Public Sector Performance', 'Improving Key Aspects of the Regulatory Environment for Business', and 'Improving Citizen Access to Information' specifically mention mining as one of the priority areas of intervention, and highlight ongoing projects in the sector that reinforce these outcomes.

II. PROJECT DEVELOPMENT OBJECTIVES

A. PDO

19. The project development objective is to reduce environmental health risks to the local population in critically polluted mining areas in Chingola, Kabwe, Kitwe and Mufulira municipalities, including lead exposure in Kabwe municipality.

B. Project Beneficiaries

20. The project will benefit communities, especially the poor and vulnerable, living in contaminated areas affected by mining activities. The interventions will target about 500 women and unemployed youth in these communities through direct support for income generating activities and enhancements of livelihoods using a community based approach in order to reduce their current exposure to hazardous employment activities. Project beneficiaries will also include more than 3,000 children who have been impacted by lead pollution in Kabwe, through direct health interventions including blood lead level testing, treatment and nutritional supplements. In Kabwe, remediation activities and management of contaminated hotspots will benefit around 70,000 people living in hotspots and an estimated 30,000 children will be beneficiaries of education and awareness building campaigns. The project will also collaborate with the proposed IFC investment to Metalco industry in Kabwe, to explore opportunities in the areas of BLL testing, waste management and waste recycling. Project interventions to reduce the impact of SO_2 on soil quality and agricultural productivity will indirectly benefit more than 1000 farmers in Mufulira. Through enhancement of skills, testing and environmental monitoring facilities, the project will strengthen capacity of regulatory authorities in monitoring of environmental and mining regulations compliance, which will have longer-term benefits for the country.

C. PDO Level Results Indicators

21. Indicators to measure achievement of the objective:

(a) Share of population living within 500m from lead contamination hotspots in project area (Percentage);

(b) People in Kabwe reported to have more than 50 percent reduction in Blood Lead Level (BLL) (disaggregated by age ≤15) (Number);

(c) Share of population in the project areas that are aware of project investments and benefits – (disaggregated by vulnerable people and sex) (Percentage);

(d) Direct project beneficiaries (number), of which female (percent).

III. PROJECT DESCRIPTION

22. All project components will contribute to reducing environmental health risks related to mining activities in Kabwe and Copperbelt provinces, which will be done broadly through: (a) optimizing existing financial mechanisms to identify, finance, mitigate and monitor prioritized contaminated areas; (b) strengthen environmental management capacity of regulatory agencies and the local governments; and (c) Targeted health interventions and improved job opportunities for affected people, particularly women and youth. The project includes the following four components:

Component 1: Remediation of contaminated hotspots and improvement of environmental infrastructure (US$29.6 million)

23. The component will finance specific remediation activities and associated environmental infrastructure in Kabwe and Copperbelt areas. These interventions would be prioritized based on a standard set of social, environment and economic criteria including assessment of immediate and medium term environmental health risks to the community. As the target sites will be identified, comprehensive environmental management plans will be prepared/updated, detailing appropriate remediation plans for all contaminated sites in Kabwe and Copperbelt province. Some of the key investments include:

Subcomponent 1.1: Remediation of contaminated hotspots and improvement of environmental infrastructure (US$11.0 million)

24. This will include identification, characterization and remediation of known hotspots of contamination in Kabwe and other locations, primarily sites that are in the proximity of the communities. It will include a voluntary in-situ remediation program for households and hotspots that are highly exposed. An appropriate technique using a combination of preventive and curative approach would be used, such as confinement, containment and treatment. A consultative and voluntary approach would be used to prevent any displacement of people or land acquisition. The subcomponent will also support associated environmental infrastructure designed to improve the surrounding environment. There is a demand for improved infrastructure for better management of hazardous and solid waste that contributes to exposure to contaminated material that was

determined through a process of consultations with affected communities. The priority areas identified for immediate engineering interventions include: i) The Kabwe Canal, which is a conduit for storm water containing hazardous material and wastes from the closed mining areas, passing through densely populated residential areas. The canal is prone to overgrowth and flooding on an annual basis, which results in overflow of hazardous material into residential backyards; and ii) The Kabwe solid waste dump site, which needs to be upgraded into an integrated scientific hazardous and solid waste management facility to provide a location for safe disposal of contaminated material from the residential areas. The subcomponent will also explore the applicability of results-based financing approaches for Kabwe waste management investment.

Subcomponent 1.2: **Rehabilitation of TDs and mine closure in Copperbelt Province (US$18.6 million)**

25. This component will assist the government to address some of its accrued environmental liabilities, by piloting closure of a few old TDs. This would be the first time such closure will be undertaken in Zambia and will allow the demonstration of technical, economic, and institutional feasibility. The choice of the TDs would be determined by the counterpart during Year 1 of project implementation using an agreed criteria of ownership[30]; immediate environmental health impacts and costs to communities; economics of closure; and potential benefits and future use. A simple and straightforward methodology will be developed and utilized under the project for evaluating and comparing sites during site identification, for assessing environmental health risks and for prioritizing cost effective interventions. Opportunities to collaborate with the private mining companies in legacy clean-up operations will be explored.

Component 2: Enhancing Institutional Capacity for Environmental Governance and Compliance (**US$13.5 million**)

26. This component will strengthen the environmental governance of the mining sector and environmental agency through a variety of interventions, including policy support and capacity building. These agencies include, MSD, Radiation Protection Agency (RPA), and Zambia Environmental Management Agency (ZEMA).

Subcomponent 2.1: Improving environmental governance in the mining sector (US$6.5 million)

27. This subcomponent will enhance mining-environmental governance and operationalize environmental surety mechanism for mine closure. The interventions will include policy support; strengthening mining and environmental regulations; capacity building and support to assist the mining sector agencies, including MSD and RPA. The capacity of MSD will be strengthened to implement the MMDA that has shifted new responsibilities to MSD, including assessment of environment health risks, and inspection of mine safety risks to communities; providing guidance to mining companies on mine closure and progressive maintenance of TDs so as to minimize risks to the neighboring communities. The RPA would be assisted to improve identification and mapping of health risks in critically polluted areas where risks related to exposure to radioactive waste material may be high.

[30] Project funds will not be used to subsidize or remediate private sector environmental or social liabilities.

28. This subcomponent will also involve review of the EPF related aspects under the MMDA, with a view of identifying gaps and weaknesses in terms of contributions to the fund, securing of bonds and investment of funds; and assessment of accuracy of the EPF closure costs. The subcomponent will also improve operational effectiveness of the EPF through developing mechanisms to identify, finance, mitigate and monitor environmental impacts related to past, present and future mining. This will include enhancing monitoring and inspection capacity; tools and guidance for identification/evaluation/mitigation of health and safety risks; and clarify the distinction between government-owned liabilities versus private sector responsibilities.

29. The policy support would involve review of the Mines and Minerals Act regulations (i.e. EPF regulations) with a view of identifying gaps and weaknesses in the legislation; identifying any omissions, inconsistencies or errors; assessment of the performance and effectiveness of the EPF from its inception in terms of contributions to the fund, securing of bonds and investment of funds; assessment of accuracy of the EPF closure cost calculation guidelines applicable to Zambian conditions; assess the criteria of allocating EPF performance categories. This support would help set up a mechanism on how to conduct and compile an Environmental Protection Fund audit report for mining operations in Zambia; engagement of key stakeholders on improvements to be made on administering of the EPF regulations; and suggest measures to strengthen the Mines and Minerals (EPF) Regulations or changes to the regulations.

30. The capacity of MSD will be strengthened to enable it to implement its new responsibilities under the 2015 Mines and Minerals Development Act, including assessment of environment health risks; providing guidance to mining companies on mine closure and progressive maintenance of tailing dams so as to minimize risks to the neighboring communities. Capacity building in MSD will consist of a range of training activities and a review of upgrading equipment and facilities. The activity would assist the MMMD to draft mining regulations supporting the MMDA and would assist the Ministry of Environment and ZEMA to develop regulations to support the Environment Management Act (EMA), 2011. The activity will review international good practices with respect to benefit distribution from extractive industries and propose regulation to support the MMDA. The RPA would be assisted to improve identification and mapping of health risks in critical residential areas where exposure to radioactive waste material may be high. Building a broad support base for improved environmental performance by mining companies requires increased awareness and engagement in sector issues by the general public and policy-makers. The activity will also provide support to Zambia Extractive Industries Transparency Initiative (EITI) regarding mining-environmental health and mining-environmental governance issues.

Subcomponent 2.2: Improving environmental compliance, enforcement and public disclosure (US$7 million)

31. This sub-component will assist in the development of regulations to support the EMA, 2011 that was enacted under the CEP. The support will also strengthen the quality and effectiveness of environmental monitoring and disclosure of environmental information, through development of a comprehensive environmental monitoring program. It will include strengthening ZEMA's capacity to review Environment and Social Impact Assessment (ESIAs), negotiate mitigation requirements with investors, improving enforcement of non-compliant facilities, developing standards and legislation to enhance environmental management monitor compliance,

and collect fees and fines.[31] The capacity building will include use of modern information tools and GIS-based techniques for effective inspection and compliance management. Particular attention would be paid to enhancing the scope and coverage of environmental inspection of polluting industries and polluted areas through designation, appointment and training of honorary inspectors.

Component 3: Reducing environmental health risks through localized interventions (US$18.5 million)

32. The support under this component to the Municipal Councils of Kabwe, Kitwe, Mufilira and Chingola relate to environmental services, such as waste management, clean drinking water, medical interventions for children and women exposed to lead contamination, and agricultural soil productivity due to acidic exposure from SO_2 emission from the past copper smelting operations. Specific support to Kabwe would focus on three key areas: i) Health interventions in partnership with the Ministry of Health (MOH); ii) Livelihood generation; and iii) Communication and education activities. The other three municipalities will be supported with income generation opportunities in contaminated areas that would enhance community involvement in addressing environmental health risks. Specific attention will be given to women and vulnerable community groups in the target areas. All activities will be relatively small, technically simple, and cost effective. Collaboration with the private sector on outreach, consultations and community stakeholder engagement will also be explored.

Subcomponent 3.1: Strengthening decentralized health interventions to reduce environmental health risks in Kabwe (US$6.0 million)

33. This subcomponent will be implemented by the Kabwe Municipal Council (KMC) in technical partnership with the MOH. It will i) assist local, district, provincial government hospitals and clinics to test potentially exposed population group based on existing data on health related to lead exposure in Kabwe; ii) evaluate data to strengthen the intervention strategy on health and education to prevent, diagnose and treat lead related problems in Kabwe; and iii) identify risk groups such as pregnant women, older children, scavengers in the targeted areas. This subcomponent will address the populations that are at risk from lead exposure by conducting integrated case management (analysis of blood lead levels, health education, exposure reduction, medical treatment). Treatment and nutritional supplements will be provided according to test results while health promotion would also be conducted in the affected communities. The project will support the development of a case based reporting system, a Monitoring and Evaluation (M&E) system and a data management system. Development and dissemination of guidelines and policy on lead and heavy metals management and associated training will be supported under this component.

[31] ZEMA plans to set up a Permanent Environment Fund (PEF), the operational feasibility of which will be piloted under the project. The PEF will receive fines and fees that will sustainably finance ZEMA to undertake area specific research and interventions.

Subcomponent 3.2: Support to local income generation, livelihood and public awareness activities in targeted areas of municipalities of Kabwe, Kitwe, Mufilira and Chingola (US$11.3 million)

34. The subcomponent is aimed to introduce income generation opportunities in contaminated areas that would enhance community involvement in addressing environmental health risks. These will include piloting reclamation of agricultural productivity of soil affected by SO_2 emissions (from smelters) and supply of clean water through community kiosks, in contaminated areas. It will also provide support to Community Based Enterprises (CBEs), in the form of capacity building and small grants to organize themselves around productive activities identified in partnership with the local councils, technical agencies and private sector in the area, the nature of which will be determined by the beneficiaries based on their demand. These livelihood opportunities will be determined based on a pre-agreed set of selection criteria to identify sub-projects, such as assessment of capacity of CBEs, skills needs, availability of service providers, market demand and barriers; and potential to partner with the private sector in the area. The sub-grants will target up to 10 priority communities per year identified in the targeted wards in Kabwe and Copperbelt Province. The technical assistance will include community-based project implementation and management in areas such as financial and supervisory support to enhance their managerial and technical capacities. Specific attention will be given to women and vulnerable community groups in the target areas. These activities will be relatively small, technically simple, and cost effective, with support for establishing value chain linkages. Collaboration with the private sector and community stakeholder groups will be explored. As part of Information, Education and Communication (IEC) activities, the subcomponent will support outreach and citizen engagement at the local level, as well as awareness building of children through interventions at primary school level.

Component 4: Project Management, Monitoring and Evaluation (US$4.0 million)

35. This component will cover the cost for project management, implementation and supervision of project activities, administration of procurement and financial management, monitoring and evaluation, and safeguards compliance monitoring. The component will cover the cost of a unified Project Coordination Unit (PCU) established under the MMMD, and three Project Implementation Units (PIUs) set up respectively under MSD[32], KMC and the ZEMA. The component will also support the cost of a Project Management Consultant (PMC) that will assist the PCU and PIUs in preparing, implementing and monitoring approved investments plans in Kabwe and Copperbelt provinces.

[32] The PIU at MSD will also support the project management costs of the RPA and the three municipalities (Kitwe, Mufilira and Chingola).

A. Project Financing

Project Cost and Financing

Project Component	Project Costs (US$)	Financier	%Financing
1: Remediation of contaminated hotspots and improvement of environmental infrastructure	29,600,000	IDA	100%
2: Enhancing institutional capacity for environmental governance and compliance	13,500,000	IDA	100%
3: Reducing environmental health risks through localized interventions	18,500,000	IDA	100%
4: Project Management and M&E	4,000,000	IDA	100%
Total Project Costs	**65,600,000**		**100%**

B. Lessons Learned and Reflected in the Project Design

36. **Lessons learnt from CEP**: A number of lessons identified by World Bank's Independent Evaluation Group (IEG) and the Implementation Completion and Results Report (ICR) of the previous project have been incorporated into the design of this project. These include:

- ***Enhanced participation of affected mining communities in planning and implementation of environmental health management interventions****:* One of the key weaknesses noted in the ICR included lack of public participation and ownership of investments by the local municipal councils. IEG mentioned that "*projects such as this, which benefit a prosperous and burgeoning extractive sector, should make a strong effort to ensure that local communities share in the benefits*". Therefore, the proposed project design is built on a participatory approach which requires community development activities to be defined, designed, planned and implemented by the local community groups. The project supports government's decentralization agenda, whereby decision making has been devolved to the municipal councils. The municipal councils of Kabwe, Kitwe, Chingola and Mufulira are the implementing agencies for their respective components. The communities will not only benefit from the project activities but also be involved in designing and implementing activities, such as livelihood enhancement activities and health interventions. The approach increases the complexity of execution of the project and associated costs of project management, but improves stakeholder buy-in and sustainability of activities.
- ***Increasing project management capacity of the implementation agencies***: Lessons from CEP indicate key reasons for delays in implementation relate to insufficient capacity of the implementing agencies in areas such as identification and planning of key procurement activities; preparing terms of reference; procurement of goods, works and consulting services following the Bank procurement guidelines; contracts management to ensure timely and quality performance; ability to remedy delays in start of physical works; and ability to monitor, evaluate and report progress. The project also strongly recognizes the need to mainstream the capacity of the government staff in implementing agencies by ensuring that regular training is provided on various fiduciary, safeguards and technical aspects of the project. Additionally, the project will support procuring a Project Management Consultant, who would work under the PCU to complement the capacity gaps of the project staff in the implementation agencies, and provide hands-on training to ensure effective coordination and implementation.

- ***Increasing social inclusion and accountability****:* Increased sensitization and awareness activities along with involvement of the Education Department to mainstream messages on environmental pollution and health impacts, are expected to enhance sustainability. The project also has a distinct component for improving livelihood and income generation opportunities for vulnerable sections of community, particularly targeting women, widows, single-women headed households, unemployed youth etc. The design builds in strong "supply and demand side" governance through increased access to information, improved pollution monitoring, transparency in environmental compliance, in collaboration with ZEMA, RPA and MSD.
- ***Improving sustainability of investments***: The CEP was implemented by the Ministry of Finance with assistance from ZCCM-IH, which resulted in poor ownership of project activities and outcomes by MMMD, MOH or KMC. The proposed project is housed in the MMMD, with three PIUs to be housed in KMC, ZEMA and MSD. In order to ensure sustainability of investments in the mining sector, the project include elements of policy intervention and operationalization of the EPF that will ensure costing and financing of environmental liabilities associated with tailings and mine closure.
- ***Involvement of a multi-sectoral Bank team****:* IEG noted that there were several changes in the task management during CEP, and that it lacked a multi-sectoral approach. The World Bank project team involves specialists from a number of sectors – environment, mining, health, social, communications, and livelihoods. The team brings prior experience and appropriate sector knowledge, relevant for the project design, implementation and monitoring.

37. **Lessons learnt from other similar projects in East Asia, South Asia and Europe and Central Asia regions**: The team reviewed lessons from similar remediation projects in India, China and Poland. The lessons reveal three key aspects that are relevant for this project design: a) The focus on underlying sector and environmental policies and regulation that regulate the "stock" and "flow" of environmental liabilities; b) the need for strong ownership by the sector ministry to lead a rather complex set of institutional, technical and financial challenges; and c) the need to focus on simple site specific and localized interventions to demonstrate quick results to generate community buy-in. These lessons have been particularly useful in informing components that focus on i) strengthening environmental governance in the mining sector; ii) environmental enforcement and compliance through ZEMA; and iii) enhancing income generation opportunities for affected communities. Another important and relevant lesson for improving implementation effectiveness is to supplement project management capacity of PIUs that has often led to delays in procurement and implementation monitoring. The project design includes the hiring of a professional project management consultant firm that would support coordination and enhance the capacity of the implementing agencies.

IV. IMPLEMENTATION

A. Institutional and Implementation Arrangements

38. The project will be implemented by the MMMD in collaboration with the Ministry of Lands, Natural Resources and Environmental Protection (MLNREP)[33], MOH, Ministry of Local

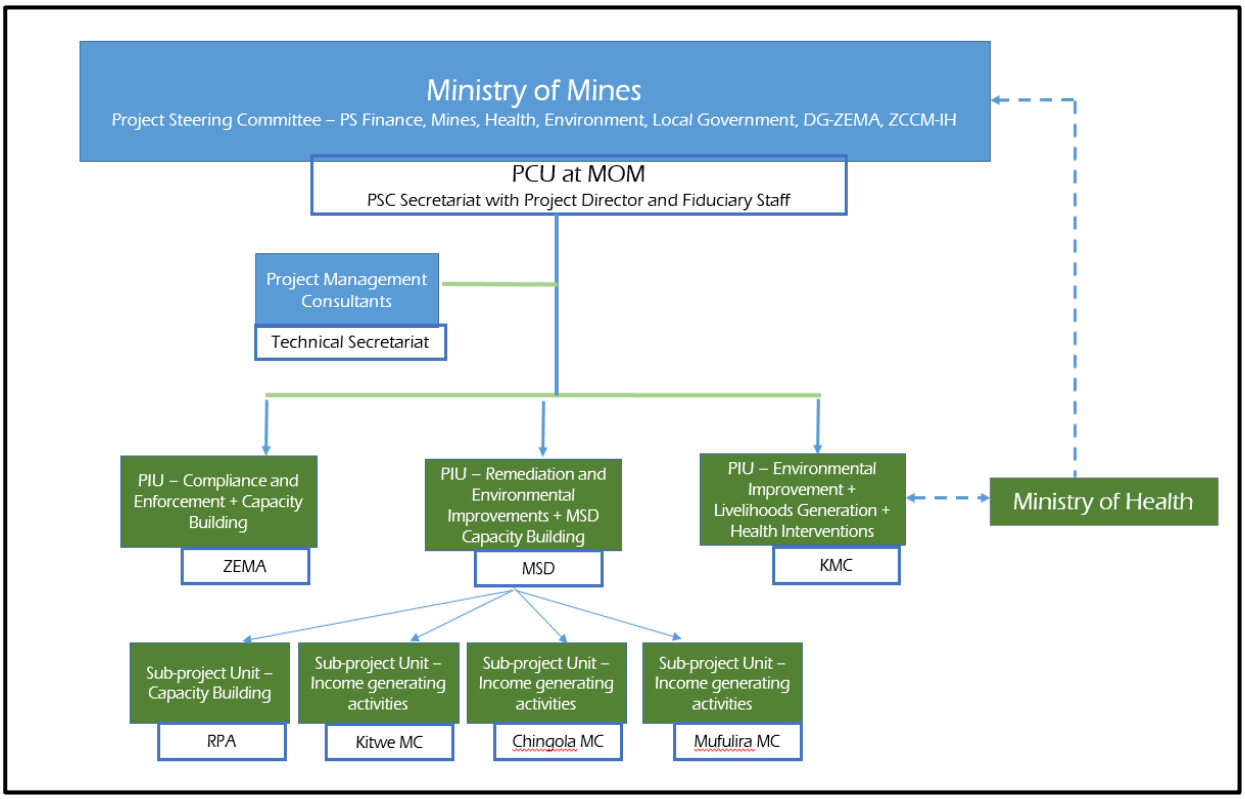
[33] ZEMA is an independent regulatory agency established under MLNREP

Government and Housing (MLGH)[34] and ZCCM-IH. The MMMD has established a Project Steering Committee (PSC) chaired by the Permanent Secretary – MMMD. The PSC comprises the Permanent Secretaries of MOF, MLNREP, MOH, MLGH, Central Province, and Director General of ZEMA and Chief Executive Officer of ZCCM-IH. A Project Coordination Unit has been established at the MMMD with a designated Project Coordinator. For the purposes of implementation, three Project Implementation Units with Designated Project Accounts have been set up at MSD, ZEMA and KMC, who would be responsible for planning, procurement, implementation and monitoring of various activities.

39. The PSC will be mainly responsible for approval of Annual Plans submitted by the PIUs and will provide strategic guidance and oversight during implementation. The PCU will act as the technical secretariat for the PSC, and its main role is to coordinate and consolidate PIU activities for reporting to the World Bank and the PSC. The PCU, with support from the PMC, will provide services to the PIUs with regards to certain cross cutting skills that may need to be centralized and shared across PIUs. 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 subcomponents; (c) ensuring the project audits; (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 following chart describes the project management structure:

[34] The MLGH is charged with the administration of the local government system. It is multi-functional in nature and oversees the implementation of delegated functions and responsibilities by municipalities by managing the social, economic and political spheres of governance.

Figure 4: Project Management Structure



B. Results Monitoring and Evaluation

40. M&E for the proposed project is guided by the project results framework (Annex 1) which will also be the basis for the evaluation of the project at completion. M&E is undertaken for reasons of transparency, learning and accountability at large, as well as to provide a platform of evidence for decision-making and policy formulation. The PCU will coordinate with the PIUs at MSD, KMC and ZEMA to organize data collection, analysis and dissemination. Data quality and timeliness of data collection and presentation will be ensured through capacity building of the relevant institutions and regular quality assurance review of data and information delivered. Given the paucity of data and information on the nexus between health and the environment, the project has factored in capacity building of the concerned institutions in M&E. The World Bank will be a key client in M&E together with the general public as all results data will be made publicly accessible through implementation support reports and the final evaluation of the project in the ICR.

Table 1: Type of Data, Sources and Responsibilities

Type of data	Data Sources	Responsible Institution	Remarks/comments
Health: Blood Lead Levels (BLL)	Testing of blood samples by local healthcare providers	MOH / KMC(DMO)	BLL testing will be part of the Integrated case management system
Ambient pollution: Soil quality ; Water quality; Air quality (lead)	Testing of soil, water and air samples	ZEMA	ZEMA will be supported with equipment, tools and skills to collect and collate environmental quality data
Livelihoods: People engaged in alternative livelihood activities	Project and activity records	PCU-MMMD	Data will be collected by PIU at the municipalities and communicated to the PCU
Compliance with point source pollution standard: Emission (Soil, water, air)	Testing of soil, water and air samples	ZEMA	New data will be collected and disclosed through the ZEMA website
Long-term sustainability: Compliance with requirements of EPF	Regular EPF reports regarding the status of the fund and compliance of license holders.	MSD with support from the EPF Committee.	Data will be collected by the EPF Fund Manager and made available to the EPF Committee, of which MSD is a member.

C. Sustainability

The sustainability of project activities will be ensured through:

41. **Delineation of liabilities in design of remediation investments.** Key eligibility criteria for all remediation investments will include: i) a clear delineation of past and current ownership; and ii) full costs accounting including operations and maintenance plan, and budgeting for maintenance and staffing. Given the enormity of the environmental liability and associated high costs of mitigation, the remediation plans will be designed to achieve specific results with respect to reduced environmental health risks for downstream communities, and will use locally appropriate material but internationally accepted design.

42. **Systemic improvement in compliance, enforcement and public disclosure of environmental information.** An improved monitoring, enforcement of compliance, and public disclosure would support public participation and awareness on pollution related issues, and also provide the basis for the regulators and sector experts to design mitigation measures that are cost-effective. An improved enforcement regime may create new opportunities for clean technology providers and improved support for new and clean investments in the country.

43. **Support to the decentralization process through empowering and capacity building for project management:** The project is designed to support the National Decentralization Policy of the GRZ which aims to empower provinces and districts to manage their own affairs for effective social and economic development. The project activities build on an implementation structure using the municipal councils to promote peoples participation at local levels. By making the municipal councils responsible for project implementation, the project aims to enhance their capacity in several technical and management areas.

44. **Municipality-led and owned relevant local interventions, such as health, livelihood and communication to improve public buy-in, while improving their quality of life.** The project interventions were designed in a participatory manner, and fully included in long term development planning. By creating new income generation opportunities, the community buy-in will be achieved: a) by benefiting from reduced exposure to polluting and improved access to health monitoring and treatment system related to lead exposure; and b) by engaging communities in pollution reduction activities to improve environmental conditions.

V. KEY RISKS

A. Overall Risk Rating and Explanation of Key Risks

Risk Category	Rating
1. Political and Governance	Moderate
2. Macroeconomic	High
3. Sector Strategies and Policies	Substantial
4. Technical design of Program	Moderate
5. Institutional capacity for Implementation and Sustainability	Substantial
6. Fiduciary	Moderate
7. Environmental and Social	Substantial
8. Stakeholders	Substantial
OVERALL	**Substantial**

45. *Political and Governance risk is Moderate.* The recent election in Zambia has generated public debate about rising income inequalities and issues related to governance. While the focus of the new government is likely to be on improving job opportunities, there may be pressure to regulate mining sector, as well as enhance transparency in public expenditure. The topic of environmental liabilities in the mining sector remains highly sensitive and is related to mining sector governance. There are strong signs that the time is right for more open dialogue and cooperation between private mining companies and GRZ to achieve sustainable roadmap for managing the past and current environmental liabilities. However, GRZ still faces social pressures in choosing to pressurize the mining companies by forcing them to share costs of past liabilities, while they try to attract new mining investments. Nevertheless, there is increasing political commitment for finding and implementing acceptable solutions to environmental health risks, which mitigates the political sensitivity risks.

46. *Macroeconomic risk is High.* Growth of the Zambian economy has averaged 6.4 percent since 2011 but has declined to an estimated 3 percent in 2015 following a six-year low in copper prices, increasing power outages, and El Nino-related poor harvests. Growth is expected to remain around 3 percent in 2016, subject to the 2016 harvest, the mining industry's reaction to softer copper prices, and stabilization of the power situation.[35] Achieving fiscal consolidation, providing reliable electricity, and balancing spending from subsidies and poverty reduction remain major

[35] World Bank Zambia Outlook.

challenges facing Zambia. The World Bank has developed a series of activities to address some of these risks, including programmatic advisory and analytical work to support the government in improving economic and fiscal management. While macro-economic risks is likely to only have marginal direct impact on project performance, there is an indirect relationship between copper prices and ability of the government to allocate resources beyond the project for addressing past environmental liabilities.

47. Macroeconomic risks to the project are further compounded by the many interlinkages between the mining sector, which is a key source of Foreign Direct Investments (FDI) and export earnings, and the macro-economy. The Zambian Kwacha exchange rate variability is largely driven by swings in the copper price or strength of the U.S. Dollar (US$), which in turn affects the strength of the mining sector through the level of FDI and export earnings. The strength of the mining sector in turn has a large impact on the balance of payments and the strength of the Zambian Kwacha (ZMK). Furthermore, as commodities are denominated in US$ and have innate value regardless of the currency they are priced in, the strength of the US$ has a major impact on the price of copper, thereby again affecting the strength of the mining sector, as well as its relative value to Special Drawing Rights (SDR).

48. The table below highlights potential impact of changes to the strength of the US$ and the price of copper on three areas of impact: (i) the availability of project funds, which are fixed in SDR; (ii) the selection of TDs and viability to close mines; and (iii) the competitiveness of new (non-copper, export oriented) jobs. As an example, a strengthening of the US$ exchange rate will reduce the US$ available for project clean-up, reduce the competitiveness of any export oriented jobs created but has an ambiguous impact on the selection of TDs.

Table 2: Potential Impact of Currency and Copper Price Effects

	Area of Impact		
Potential change	**Availability of Project Funds**	**Selection of TDs**	**Competitiveness of New (export oriented) Jobs.**
Increase (decrease) in USD strength.	Since project funds availability are fixed in SDR, an <u>increase</u> (decrease) in the strength of the US$ will buy <u>less</u> (more) US$. This will <u>negatively</u> (positively) affect the ability of the project to purchase goods denominated in US$.	The overall impact is ambiguous due to opposing forces, but could be significant. The direction of overall impact will be driven by the mix of foreign vs. domestic inputs in mining TDs. Explanation: As many metals are denominated in US$, all else remaining equal, an <u>increase</u> (decrease) in the strength of the US$ will <u>decrease</u> (increase) the US$ price of metals, which in turn will <u>decrease</u> (increase) the economic attractiveness of mining low-grade tailings resources. This will be offset by an improvement in the "domestic cost" side of mining TDs since a <u>decrease</u> (increase) in the price of metal will	An <u>increase</u> (decrease) in the strength of the US$ will <u>increase</u> (decrease) the competitiveness of Zambia exports.
Increase (decrease) in copper price and corresponding increase (decrease) in ZMK strength.	An <u>increase</u> (decrease) in the price of copper will <u>increase</u> (decrease) the ZMK:US$ and ZMK:SDR exchange rates and make domestic services and goods <u>more</u> (less) expensive.		An <u>increase</u> (decrease) in the price of copper will <u>increase</u> (decrease) the ZMK: US$ and ZMK: SDR exchange rates and <u>decrease</u> (increase) the competitiveness of non-copper Zambian exports. This will mean an increase in mining sector jobs (if producers believe the price increase is

		weaken (strengthen) the ZMK, which will increase (decrease) the competitiveness of mining low-grade tailings resources through lower cost of domestic inputs.	long term) and decrease non-mining sector jobs.

49. *Sector Strategies and Policies risk is Substantial.* The issue of addressing environmental liabilities associated with earlier mining operations is a sensitive one. The sensitive aspects of mining policy to address past environmental liabilities, is fraught with risks of discouraging mining sector investments in Zambia through additional financial burden on the private mining companies and risks of losing current employment in the mining sector by forcing permanent closure of polluting operations. ZEMA's record in enforcing environmental compliance has been uneven given the importance of the mining sector and the role it has played in generating jobs and providing revenues to the GRZ. Mining companies and idle operations are seen as source of generating current and potential future employment, therefore there are political sensitivities associated with this public perception and the need for government to create more employment. Nevertheless, there is increasing political commitment for addressing environmental health risks in contaminated hotspots and towns such as in Kabwe. The project is seen as an opportunity to mitigate some of the political and reputation risks and create a better environment for attracting clean and new investments in the mining sector.

50. *Institutional capacity risks is Substantial*. The project is anchored in the MMMD, which will work in coordination with other implementing agencies, including MSD, ZEMA and KMC. The municipal councils are traditionally known to have poor institutional capacity. However, under the decentralization policy, the GRZ will transfer funds and assign additional human resources, along with functional responsibilities to the lowest levels of government. The project also builds in extensive institutional strengthening and capacity building measures for all the implementing agencies. The project will mitigate some of the capacity related risks by relying on the PMC support and will source international and local technical and fiduciary experts from private sector.

51. *Stakeholder risk is Substantial*. Many years of mining have resulted in substantial risks to human health and environment in the several mining towns. Many stakeholders perceive that the current state of problems is caused by poor environmental management practices adopted by the private sector, which was further aggravated by poor enforcement by regulatory agencies such as ZEMA and MSD. The project will address issues related to better enforcement of environmental and mining regulations, including collecting, collating and disclosing environmental information to communities. However, there is a risk of offering insufficient intervention because the project will not be able to address all environmental issues which require significant resources and longer-term engagement. While efforts to identify communities and individual level health risks will be supplemented by a comprehensive plan and health sector interventions, there may be concerns related to past environmental liabilities. The Zambian (mining and environmental) regulations do not have specific provisions for civil/class-action or litigation actions against previous mining operations. Furthermore, the Zambian courts lack experienced lawyers, judges and case precedents to adjudicate such cases effectively. The project would strengthen the regulations, particularly on monitoring and mitigation, to address the ongoing contamination of the area. The

risks would be mitigated using improved public participation in designing the health interventions, a massive information and education campaign, and decisions surrounding project investments, particularly under Component 1, at local levels. Intensive assessments were undertaken during project preparation to ensure that pre-identified investments listed by local municipal councils are in alignment with needs expressed by targeted communities. Funds allocated for both mitigation and income generation activities are commensurate with identified needs, and the prioritization process. Participatory processes will ensure adequate consultation with key stakeholders, including government partners and targeted communities, particularly in order to facilitate inclusion of the voice and perspective of vulnerable beneficiaries in the decision-making processes. Key activities to mitigate against the risk of elite capture include: (i) participatory processes that foster inclusion of key stakeholders and representation of vulnerable groups in the selection process (e.g. elderly, women, youth); (ii) eligibility criteria of associated infrastructure that specifies the need to demonstrate clear positive impact for the most vulnerable; and (iii) the requirement that 50 percent of livelihoods sub-projects target the most vulnerable.

52. *Environmental and Social Safeguards risks is Substantial:* The project design includes activities that might cause significant adverse impacts. Based on the environmental risk assessment process, the overall project was assigned Environmental Assessment Category A recognizing the current environmental degradation and health impacts resulting from poor mining practices and inadequate environmental management. Activities that pose a potentially substantial risk during implementation include: (a) the closure or rehabilitation of TDs 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. These risks would be mitigated by ensuring the development of comprehensive site specific environmental and social impact assessment (ESIA). The ESIA would be consulted upon and publically disclosed prior to finalization of design. The site specific Environment and Social Management Plans (ESMPs) supported by health and safety management plans would be prepared as part of the ESIA, and will be implemented and monitored by respective PIUs.

VI. APPRAISAL SUMMARY

A. Economic and Financial Analysis

53. **The project's development impact** is expected to be significant based on an economic analysis that estimated short term and long-term impact of project implementation. Remediation and related reduction of lead hazard and exposure results in health impact reduction and consequential increase of life-time labor productivity and better quality of life relative to baseline in Kabwe. Also, localized project interventions will have mid-term and near term direct positive economic effect, like increase of employment, regional development including potential for project replication and scaling up.

54. Given the nature of wide-spread pollution of land, water and soil, the environment liabilities need **public investment** to address stock and flow of public health risk. A cost-benefit analysis of public sector provision for financing was carried out to determine if project investment is profitable from the economic viewpoint. The analysis compares project costs (investment and operational/maintenance costs) with benefits generated by such an operation (an increase of lifetime income due to reduced risk of IQ loss and localized investment benefits). The analysis is

based on the following assumptions: (i) a period of five years for the realization of the project; (ii) a lifetime period of fifteen years following project completion; (iii) 6 percent discount rate. The results of the economic analysis indicate an economic rate of return within the range of 16-34 percent, with the net present value (NPV) at US$18-59 million, and the Benefit-Cost ratio above 1.0.

55. The costs of the project include investment costs and maintenance costs. For an overall project cost of US$65.6 million, investment costs are assumed to be US$10 million per year over five years, and maintenance costs are assumed to be US$2.82 million per year over 20 years. Based on this analysis, the NPV of investment costs is estimated at US$62.6 million (20 years, 6 percent discount rate).

56. The benefits include:

(a) *Reduction of BLL*: Some benefits of lead risk reduction are quantified as part of the economic analysis. Given the uncertainty of BLL and associated lifetime labor productivity increase, several scenarios are analyzed, including 25 percent, 50 percent, and 75 percent BLL reduction compared to the baseline level (detailed in table below). The project interventions are expected to prevent loss of IQ in children of Kabwe. It is estimated that for 25%-75% BLL reduction 1,800-9,000 IQ units loss will be prevented. The growth rate of GDP per capita as a proxy for annual income in Kabwe is projected in the range 2.5-4 percent. This range corresponds to the 2015 IMF Regional Economic Outlook for Sub-Saharan Africa.

Table 3: Scenarios for Lifetime Income gain due to BLL reduction in children (US$ million)

BLL reduction	25%		50%		75%	
GDP per capita growth rate	2.5%	4%	2.5%	4%	2.5%	4%
Years	Scenario 1 (Low)	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6 (High)
1	0.02	0.03	0.04	0.06	0.08	0.13
2	0.18	0.29	0.42	0.69	0.85	1.38
3	0.37	0.60	0.89	1.44	1.78	2.89
4	0.56	0.92	1.35	2.20	2.70	4.39
5	0.64	1.05	1.54	2.51	3.09	5.02
6	0.64	1.05	1.54	2.51	3.09	5.02
7	0.64	1.05	1.54	2.51	3.09	5.02
8	0.64	1.05	1.54	2.51	3.09	5.02
9	0.64	1.05	1.54	2.51	3.09	5.02
10	0.64	1.05	1.54	2.51	3.09	5.02
11	0.64	1.05	1.54	2.51	3.09	5.02
12	0.64	1.05	1.54	2.51	3.09	5.02
13	0.64	1.05	1.54	2.51	3.09	5.02
14	0.64	1.05	1.54	2.51	3.09	5.02
15	0.64	1.05	1.54	2.51	3.09	5.02
16	0.64	1.05	1.54	2.51	3.09	5.02
17	0.64	1.05	1.54	2.51	3.09	5.02
18	0.64	1.05	1.54	2.51	3.09	5.02
19	0.64	1.05	1.54	2.51	3.09	5.02
20	0.64	1.05	1.54	2.51	3.09	5.02
NPV	$6.08	$9.89	$14.59	$23.71	$29.18	$47.42

(b) Economic benefits of the project also include reduction of an adult cardiovascular mortality due to a reduction of blood pressure in the exposed population (as a result of BLL reduction in adults). The NPV of cardiovascular mortality reduction is estimated at US$2.4 million.

(c) Medical treatment benefits (for children with BLL that exceeds 45 µg/dL), as well as benefits of additional nutritional supplements for the population with elevated BLL (3000 people in total for both types of treatment). Medical treatment during five years of project implementation is translated into the IQ improvement that is valued at US$13.4 million (NPV with 6% discount rate).

(d) *TD rehabilitation* including trees planting will establish wooded zones to restore some ecosystem services which will improve welfare of local population while simultaneously reducing lead exposure. Economic benefits of wooded areas are estimated at US$110 thousand for 20 years.

(e) *Localized interventions* will have mid-term and near term direct positive economic effects such as increase of employment, regional development including potential for project replication and scaling up. About 3,000 people should benefit from localized interventions.

With 6 percent discount rate over the 20 years, NPV of localized interventions is estimated at US$58.5 million.

57. Table 4 presents preliminary estimation of NPV (10 percent discount rate) and ERR for the project. The uncertainty of the result is explained by uncertainty of BLL impact on the IQ increase of the Kabwe population.

Table 4: Estimated NPV (US$ million) and ERR for the Project

	Lifetime income gain		**Health benefits adults**	**Medical treatment benefits**	**Wooded areas benefits**	**Livelihoods creation benefits**	**Cost**	**Net benefits**	
Year	**Low**	**High**						**Low**	**High**
1	0.02	0.13	0.18	0.69	0.002	0.204	10	(8.92)	(8.80)
2	0.18	1.38	0.18	2.74	0.004	2.04	10	(4.86)	(3.65)
3	0.37	2.89	0.18	3.43	0.006	4.08	10	(1.94)	0.59
4	0.56	4.39	0.18	4.80	0.008	5.1	10	0.65	4.49
5	0.64	5.02	0.18	4.80	0.008	6.12	10	1.75	6.13
6	0.64	5.02	0.18	0	0.008	6.12	2.82	4.13	8.52
7	0.64	5.02	0.19	0	0.009	6.12	2.82	4.14	8.53
8	0.64	5.02	0.20	0	0.009	6.12	2.82	4.15	8.53
9	0.64	5.02	0.20	0	0.010	6.12	2.82	4.16	8.54
10	0.64	5.02	0.21	0	0.010	6.12	2.82	4.16	8.55
11	0.64	5.02	0.22	0	0.011	6.12	2.82	4.17	8.56
12	0.64	5.02	0.22	0	0.011	6.12	2.82	4.18	8.57
13	0.64	5.02	0.23	0	0.012	6.12	2.82	4.19	8.57
14	0.64	5.02	0.24	0	0.012	6.12	2.82	4.20	8.58
15	0.64	5.02	0.25	0	0.013	6.12	2.82	4.21	8.59
16	0.64	5.02	0.26	0	0.014	6.12	2.82	4.22	8.60
17	0.64	5.02	0.27	0	0.014	6.12	2.82	4.22	8.61
18	0.64	5.02	0.28	0	0.015	6.12	2.82	4.23	8.63
19	0.64	5.02	0.29	0	0.016	6.12	2.82	4.25	8.64
20	0.64	5.02	0.30	0	0.017	6.12	2.82	4.26	8.65
NPV	$6.08	$47.42	$2.39	$13.37	$0.11	$58.46	$62.59	$17.81	$59.26
ERR								16%	34%

58. Analyses of various interventions under the project demonstrate clear benefits and **value added of the World Bank**. The proposed localized interventions to reduce environmental pollution will create jobs and bring direct economic benefit. The proposed project maximizes the development impact of staff effort that would lead to increase of employment and higher productivity in remediated agriculture land. Greening of the reclaimed area will create additional jobs for local population, and will result in restoration of ecosystem values of wooded area in Kabwe. The interventions related to reducing lead exposure and for reduction of burden of disease and IQ loss will bring quantifiable socio-economic benefits. 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.

B. Technical

59. All identified project investments and livelihood interventions were prioritized by communities through a participatory process. All works and investments made under the project will be subject to technical scrutiny to ensure that they meet international design and engineering standards; when available, they will follow international best practices in remediation techniques and environmental infrastructure for reduction of pollutant-exposure to community; and follow government-managed systems for health and livelihood interventions in municipal councils. The project will ensure competitive hiring of qualified surveyors and engineers and selection of qualified and competent contractors to design, implement and monitor works. The project will build upon the existing technical capacity within the implementing agency reinforced with the implementation support offered through qualified engineers in the PMC.

C. Financial Management

60. A Financial Management (FM) assessment was conducted on all PIUs (MMMD/MSD, ZEMA and KMC) for the project. The objective of the assessment was to determine whether the implementing entities have acceptable FM arrangements in place that satisfy the Bank's Operation Policy/Bank Procedure (OP/BP) 10.00. These arrangements would ensure that the implementing entities: (a) use project funds only for the intended purposes in an efficient and economical way; (b) prepare accurate and reliable accounts as well as timely periodic interim financial reports; (c) safeguard assets of the project; and (d) have acceptable auditing arrangements. The FM assessment was carried out in accordance with the Financial Management Manual for World Bank Investment Project Financing Operations that became effective on March 1, 2010 and issued (retrofitted) on February 4, 2015.

61. The conclusion of the assessment is that FM arrangements at the three PIUs in place meet the World Bank's minimum requirements under OP/BP10.00 and are therefore adequate to provide, with reasonable assurance, accurate and timely information on the status of the project. Both the accounting and internal audit staff of the implementing agencies have relatively little or no experience in implementing Bank-financed projects but mitigation measures are foreseen, including training of accounting and audit staff and inclusion of FM procedures in the Project Implementation Manual (PIM). The World Bank conducted a first round of training of both accounting and audit staff prior to appraisal. Of the three PIUs, ZEMA has an acceptable Financial Management System, which is computerised and meets the World Bank requirements.

62. Budget preparation and monitoring will follow national procedures, full details of which has been documented in the PIM. The Financial Management Procedures Manual as part of the PIM documents the accounting policies and procedures to be used for the project. KMC and ZEMA will submit their Annual Work Plans and Budgets to PCU for consolidation. The project will use cash basis accounting in line with International Public Sector Accounting Standards (IPSAS). All the PIUs have functional internal audit units which are adequately staffed. They also have audit

committees that meet on a regular basis; therefore, the project will rely on both the internal audit units and the audit committees of the implementing agencies for internal audit functions.

63. The project will submit quarterly interim financial reports as agreed with the World Bank, within 45 days of the end of each calendar quarter. The PCU will prepare annual accounts within three months after the end of the financial year in accordance with accounting standards acceptable to the World Bank. The PCU will be responsible for ensuring that the reports are audited and submitted to the World Bank within six months after the end of the financial year. The project's financial statements will be audited by the Office of the Auditor General, the supreme audit institution in Zambia, which may contract acceptable private audit firms to conduct the audits on their behalf. Audit reports together with management letters should be submitted to the World Bank within six months after the close of the year. Audit reports will be publically disclosed by the World Bank in accordance with the World Bank's disclosure policy.

D. Procurement

64. Procurement under the proposed project will be carried out in accordance with the i) World Bank's "*Guidelines: Procurement of Goods, Works and Non-Consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers*" dated January 2011 and updated July 2014; and ii) "*Guidelines: Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers*" (*the Procurement Guidelines*) dated January 2011 and updated July 2014; iii) "*Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants, (the Anti-Corruption Guidelines*)" dated October 15, 2006 and revised in January 2011; and iv) the provisions stipulated in the legal agreement.

65. The procurement procedure to be followed for National Competitive Bidding ("NCB") shall be the open bidding procedure set forth in the Public Procurement Act, 2008, Act. No.12 of 2008, as amended by the Public Procurement (Amendment) Act, 2011, Act No. 15 of 2011 (the "PPA"), and the Public Procurement Regulations, 2011, Statutory Instrument No. 63 of 2011 (the "Regulations"); provided, however, that such procedure shall be subject to the provisions of Section I and Paragraphs 3.3 and 3.4 of Section III, and Appendix 1 of the Procurement Guidelines, and the additional provisions as provided in Annex 2 Procurement.

66. Procurement capacity assessments of the implementing agency (including MMMD/MSD, KMC and ZEMA) for the project was carried out as part of project preparation. The assessment concluded that procurement management arrangements in place are adequate and compliant with the Procurement Guidelines. A PMC is in place to assist with the preparation of various investments. The PMC will continue to assist the PIUs during implementation.

Procurement methods to be used for the Project

67. Particular methods of procurement of goods and works are as follows:

(a) International Competitive Bidding. Except as otherwise provided, goods and works shall be procured under contracts awarded on the basis of International Competitive Bidding (ICB).

(b) Other methods of procurement of goods and works. The following list specifies the methods of procurement, other than International Competitive Bidding which may be used for goods and works. The Procurement Plan specifies the circumstances under which such methods may be used:

(i) National Competitive Bidding
(ii) Procurement from UN agencies
(iii) Force Account
(iv) Shopping
(v) Direct Contracting
(vi) Community Participation in Procurement.

68. Particular methods of procurement for consulting services are:

(a) Quality and Cost-Based Selection (QCBS). Except as otherwise provided in the paragraph below, consultants services shall be procured under contracts awarded on the basis of Quality and Cost-Based Selection.

(b) Other methods of procurement of consultants' services. The following list specifies selection methods, other than Quality and Cost-Based Selection, which may be used for consultants' services. The Procurement Plan shall specify the circumstances under which such methods may be used:

(i) Quality-Based Selection (QBS)
(ii) Selection based on the Consultant's Qualifications (CQS)
(iii) Least-Cost Selection (LCS)
(iv) Single-Source Selection for firms (SSS)
(v) Individual Consultants (IC)
(vi) Single-Source Selection for IC (SSS).

E. Social (including Safeguards)

69. The socio-economic dimensions of the project, particularly on populations affected by exposure to chemical and mining related contamination and other hazards include: (a) need for inclusion of communities in the remediation planning (and implementation) process; (b) citizen engagement and awareness building about environmental quality in their neighborhood; (c) building social capital at community level through localized interventions, with a special focus on vulnerable community members; and (d) adherence to World Bank policy on land acquisition and resettlement.

70. **Inclusion**: CEP provided a number of important lessons, one of which was the importance of inclusion of the local population into decision making for such remediation projects to increase sustainability of investments and promote understanding of the purpose of project investments. The project has designed all subprojects with such participatory approach in mind, and furthermore designates a subcomponent to purely community driven projects dedicated to improvements of environmental health among the population most affected by lead pollution.

71. **Gender**: Another lesson from CEP and consultations with the local government stakeholders identified women to be more exposed to lead pollution due to proximity to contaminated soil in the houses; the age-old cultural tradition of soil ingestion during pregnancy and potential involvement in income-generating activities related to trade of contaminated soil and hazardous materials. Women have the potential to play an important role in behavioral change that could significantly reduce exposure of children to hazardous environment. Kabwe has no active lead mining, but has massive deposits of lead in the soil within residential areas as a result of mining dumping and subsequent informal soil mining for construction activities. Women in Kabwe can therefore play an important role in changing health seeking behavior, including mitigation of health impacts due to lead poisoning. Thus, the project has a strong emphasis on inclusion of women in the sensitization and communication campaign, participation in the health interventions that target affected children, and local level nutritional support, livelihood support activities.

72. **Vulnerable groups**: The selected municipalities have already implemented a number of initiatives targeting groups such as women headed households, the elderly, the 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.

73. **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 TDs and 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) was prepared, consulted upon, and disclosed on July 12, 2016 in country and July 20, 2016 through InfoShop. 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.

F. Environment (including Safeguards)

Climate Change Screening

74. The Climate and Disaster Risk Screening Report identified that the target project locations in the future will be moderately exposed to the natural hazards like drought, extreme precipitation and flooding and strong winds. Therefore, the preparation of the proposed subproject activities will incorporate monitoring of the level of climate and geophysical risks identified as relevant to the project. Where necessary, additional studies and consultations will be organized. Adaptation covers a wide range of activities that will enhance the ability to respond to climate change-related issues such as floods, drought, threats to water resources and strong winds. The project's physical investments will cover activities that (a) are relatively small scale investments; (b) have scope for easily reacting to climatic hazards (for example, to improve management of solid waste in Kabwe or improving agricultural productivity of contaminated soil in Mufulira and Chingola, etc.); and (c) possess an inherent flexibility to react to changing climatic condition, should this become

necessary (for example, when a community decides and plans the income generating activities, resilience can be built with minor additional efforts). Adaptation will thus be promoted as one of the key design principles for the scope of planned activities. Mitigation efforts are targeted at reducing greenhouse gas (GHG) emissions by measures such as improved management of solid waste in Kabwe; and afforestation and greening initiatives in four municipal councils. While resource efficiency will be an important design criterion in all components, especially those dealing with physical investments and livelihood generation, the project will not target specific measures to reduce, and possibly market, GHG emissions. The investment on solid waste management in Kabwe will be designed to reduce methane generation of organic waste currently being disposed into an open dump. The social development aspects, such as capacity building and training, may significantly raise awareness of the impact of climate hazards, both current and future.

Environmental Safeguards

75. OP/BP 4.01 Environmental Assessment has been triggered and the project is assigned an overall environmental category A – full assessment. 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. In addition, OP 4.11 Physical Cultural Resources has been triggered.

76. 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 evaluating the significance of environmental risks and impacts; development of site specific mitigation and monitoring plans when subproject details are identified; and institutional arrangements for safeguards implementation and capacity building measures. The ESMF provides guidelines for the development of ESIAs and ESMPs that will present mitigation measures to address the potential environmental and social impacts at the subproject level, once the activities location and scope have been identified. An ESMF has been prepared, consulted upon, publically disclosed on July 12, 2016 in country and July 20, 2016 through InfoShop.

77. Based on ESMF screening criteria, the following activities have been identified that might cause significant adverse impacts, proposed for funding in the second year of the project: (a) the closure or rehabilitation of TDs 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, site specific ESIA and/or ESMP will be prepared for all subprojects 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 the ESIA/ESMP findings to further improve project designs and minimize adverse impacts while maximizing positive impact on people and environment.

G. World Bank Grievance Redress

78. Communities and individuals who believe that they are adversely affected by a World Bank supported project may submit complaints to existing project-level grievance redress mechanisms or the World Bank's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project affected communities and individuals may submit their complaint to the World Bank's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of World Bank non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit http://www.worldbank.org/GRS. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

ANNEX 1: RESULTS FRAMEWORK AND MONITORING

ZAMBIA - MINING AND ENVIRONMENTAL REMEDIATION AND IMPROVEMENT PROJECT

Results Framework

Project Development Objectives

PDO Statement

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

These results are at	Project Level

Project Development Objective Indicators

Indicator Name	Baseline	Target Values					
		YR1	YR2	YR3	YR4	YR5	End-of-project target
1. Share of population living within 500m from lead contamination hotspots in project area (Percentage)	100	100	100	70	50	30	30
2. People in Kabwe reported to have more than 50% reduction in Blood Lead Level (BLL) (disaggregated by age ≤15) (Number)	0	100 60	1,100 660	2,300 1,380	3,500 2,100	4,000 2,400	4,000 2,400
3. Share of population in the project areas that are aware of project investments and benefits	0	0	10 10 10	30 30 30	50 50 50	70 70 70	70 70 70

– (disaggregated by vulnerable people and sex) (Percentage)							
4. Direct project beneficiaries (number), of which female (%)	0	0	1,000 (50%)	3,000(60%)	10,000 (70%)	13,000 (70%)	13,000 (70%)

Intermediate Results Indicators

Indicator Name	Baseline	Target Values					
		YR1	YR2	YR3	YR4	YR5	End Target
Contaminated land managed or dump sites closed under the project - (Core) (Number)	0	0	2	5	8	10	10
School children in Kabwe targeted for awareness on prevention of exposure to Lead contamination (Number)	0	2,000	5,000	1,0000	20,000	30,000	30,000
Beneficiaries of livelihoods sub-projects (Number) (number of women)	0	100 60	1,000 600	2,000 1,200	2,500 1,250	3,000 1,500	3,000 1,500
People with high Blood Lead Levels treated under the project (Number)	0	0	500	4,000	5,000	7,000	7,000
Coverage of project area by ZEMA monitoring of water, soil and air quality of project area (Percentage)	0	5	20	40	60	80	80
Share of mines in project area covered by annual safety	0	5	15	25	35	45	45

inspection by honorary inspectors (Percentage)							
Share of solid waste in project area collected and safely disposed of in Kabwe (Percentage)	0	0	10	30	50	80	80
Share of mineral rights holders (excluding artisanal mineral rights holders) complying with the EPF. (Percentage)	20	20	20	40	60	70	70

Indicator Description

Project Development Objective Indicators

	Indicator Name	Description (indicator definition etc.)	Frequency	Data Source / Methodology	Responsibility for Data Collection
1	Share of population living within 500 m from lead contamination hotspots in project area (%)	The indicator relates to the health risk outcome of the PDO. It measures the share of people that live within 500 m from the borders of lead contamination hotspots in project area.	Annual	Data on the population living in the project area comes from the 2010 national census data and will be overlaid with the map showing the location and extent of the lead contamination hotspots (which will be updated annually).	PCU, with support from PMC
2	People in Kabwe reported to have more than 50% reduction in Blood Lead Level (BLL) (disaggregated by age ≤15) (Number)	The indicator relates to the lead exposure outcome of the PDO. It counts the number of people that have been selected through a screening process based on blood samples to receive treatment under the project, are treated	Annual	Testing and analysis of blood samples (and reported in case management system and input from doctors in the project areas).	PCU, with support from PMC

		and show a reduction of 50% of their former BLLs. Selection is based on the severity of the BLLs and treatment will be managed through an integrated case management system. Data and information on the distribution and occurrence of BLLs from the screening will not be disclosed. Targets are annual.			
3	Share of population in the project areas that are aware of project investments and benefits – (disaggregated by vulnerable people and sex) (Percentage)	This indicator captures citizen engagement of the project especially as regards vulnerable people and women, and it therefore also a gender indicator. It measures knowledge and understanding of the people living in the project areas of the project and its interventions. Targets are annual.	Bi-annual	Beneficiary survey	PCU, with support from PMC
4	Direct project beneficiaries (number), of which female (%)	The indicator measures number of people that receive benefits from the project and it pitched at the activity-level. Targets are cumulative.	Bi-annual	Beneficiary survey	PCU, with support from PMC

Intermediate Results Indicators

	Indicator Name	Description (indicator definition etc.)	Frequency	Data Source / Methodology	Responsibility for Data Collection
1	Contaminated land managed, rehabilitated or dump sites closed under the project - (Core) (Number)	This intermediate indicator is linked to the PDO indicator on health risk. It counts the number of sites contaminated (with Lead, Copper or SO_2 or other chemicals) that present immediate risks to the environmental health of the population living around it or on it that are managed, rehabilitated or closed. Targets are cumulative.	Annual	Technical inspection upon completion of works.	PCU, with support from PMC
2	School children in Kabwe targeted for awareness on prevention of exposure to Lead contamination (Number)	This intermediate indicator is linked to the PDO indicator on lead exposure. It reflects massive education, information and awareness building campaign that would focus on (1) educating children about harmful effects of lead exposure (2) means to prevent the exposure (3) ways to get medical help under the project to address the disabilities caused due to lead exposure. Targets are cumulative.	Annual	Review of report from providers of awareness campaigns.	PCU, with support from PMC
3	Beneficiaries of livelihoods sub-projects (Number) (disaggregated by sex)	The intermediate indicator is linked to the PDO indicator on health risks. It counts the number of people engaged in alternative livelihood activities (to facilitate a behavior change of less	Annual	Project and activity records.	PCU, with support from PMC

		contact with contaminated soil and water) supported under the project and disaggregated by sex. Targets are cumulative.			
	People with high BLLs treated under the project (Number)	The intermediate indicator is linked to the PDO indicator on lead exposure. It counts the number of people that have been selected through a screening process based on blood samples to receive treatment under the project and are treated. Targets are cumulative.	Annual	Project and activity records.	PCU, with support from PMC
4	Coverage of project by ZEMA monitoring of water, soil and air quality of project area (%)	The intermediate indicator is linked to the PDO indicator on health risks as it captures the capacity of ZEMA to regularly monitor water, soil and air quality based on sampling in the project area and the geographical extent of the monitoring. Targets are annual.	Annual	Review of ZEMA standards and custom monitoring of water, soil and air quality for coverage and data quality.	PCU, with support from PMC
5	Share of mines in project area covered by annual safety inspection of mines by honorary inspector (Number)	The intermediate indicator is linked to the PDO indicator on health risks as it captures risks of workers and risk potential and actual leaking pollutants from mines. It counts the mines have are inspected at least once a year by honorary inspectors.	Annual	Review of inspection reports signed by honorary inspectors.	PCU, with support from PMC

6	Share of solid waste collected and safely disposed of in Kabwe (Percentage)	The intermediate indicator is linked to the PDO indicator on health risks and lead exposure. It measures both collection, transport and disposal of solid waste at the SWM facility in Kabwe. Targets are annual.	Annual	Estimation of total volume of solid waste by Kabwe Municipality. Estimation of total volume of solid waste received and disposed of at SWM facility at Kabwe.	PCU, with support from PMC
7	Share of mineral rights holders (excluding artisanal mineral rights holders) complying with the EPF. (Percentage)	The intermediate indicator is linked to sustainability of efforts to reduce health risks and lead exposure through the provision of financial assurances to pay for closing of mining operations. It measures the share of mineral rights holders (excluding artisanal mineral rights holders) which are able to produce financial surety in the form of cash payments, bank guarantees and other instruments compliant with the relevant regulation. Targets are annual.	Annual	Regular EPF reports regarding the status of the fund and compliance of mineral rights holders.	PCU, with support from PMC

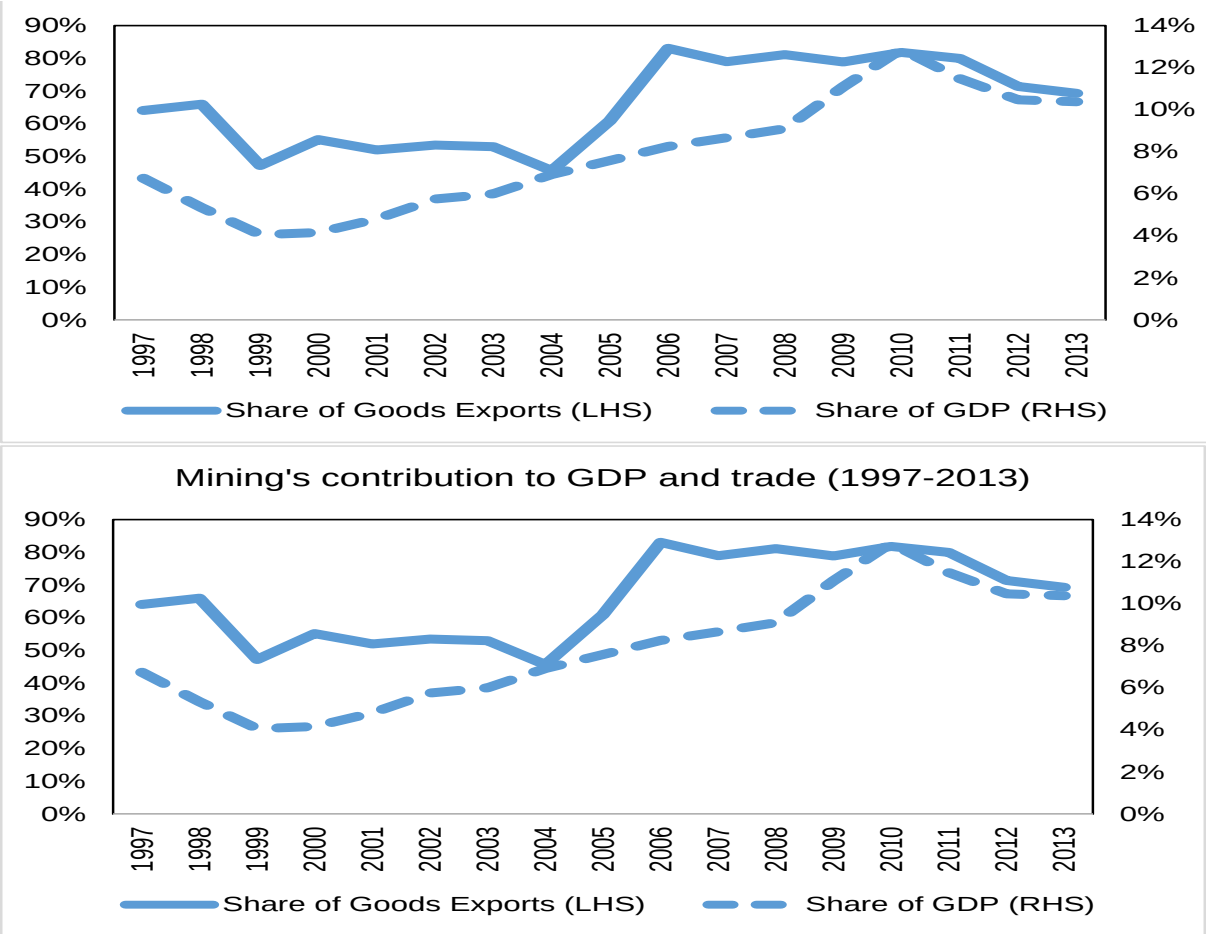
ANNEX 2: DETAILED PROJECT DESCRIPTION

ZAMBIA - MINING AND ENVIRONMENTAL REMEDIATION AND IMPROVEMENT PROJECT

A. Background

1. **Zambia's economy is heavily dependent on natural resources**, particularly mining and increasingly forestry. Copper and cobalt account for 80 percent of the exports. With favorable copper prices and robust macro-economic conditions, Zambia grew at an average of 6.45 percent per year, attaining a GDP per capita of US$1,845 and a GNI per capita of US$1,810 in 2013. The expanding mining sector has also been responsible for an expansion of mining contribution to GDP. Data from the official Central Statistical Office shows that when copper prices were at their peak in 2010 and 2011, mining contributed approximately 12 percent to Zambia's GDP.

Figure 2.1: Mining's Contribution to Gross Domestic Product and Trade over 1997 to 2013



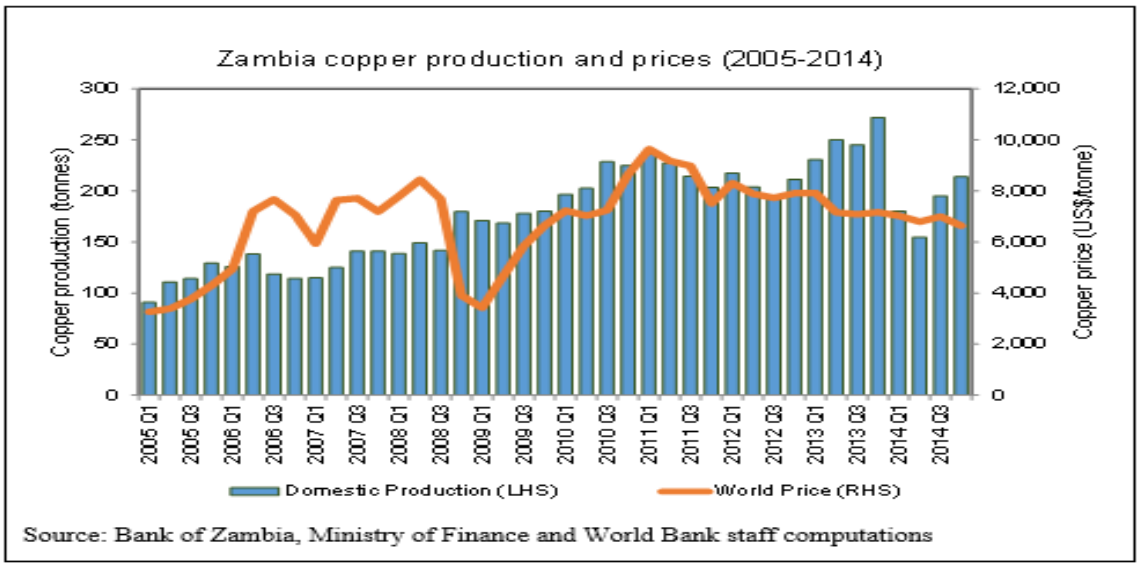
2. **However a 'Resource-Paradox' exists in Zambia**. While it has vast areas that are rich in minerals, it suffers from the classic paradox of plenty -- with its wealth of resources not translating into human development. Despite the rapid economic growth over the past decade due to expansion of the copper mining industry and agriculture diversification, Zambia remains one of

the poorest countries in the world with 60 percent of the population living below the poverty line and 42 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. Growth has been urban-centered and urban poverty fell to 35 percent in 2012, while rural poverty remains at 74 percent, with a majority of the rural population dependent on subsistence agriculture. Zambia therefore reflects a case whereby affluence of natural resources has not translated into human development and the challenges it faces 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 the subsequent environmental health and socioeconomic cost (health hazards, relocation, alteration of the social structure etc.).[36] Zambia now faces the intergenerational trade-off between decades-old deflected costs of negative externalities due to poor enforcement of environmental regulations or 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.

3. The mining sector is a major contributor to Zambia's economic growth. Copper production has been the backbone of the country's economy and historically, the performance of the Zambian economy has closely followed the fortunes of copper mining. 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, after the USA and the former Soviet Union. As a copper rich nation, Zambia has benefited from the unprecedented increases in commodity prices over the past decade and the surge in international merger and acquisitions, along with large foreign direct investment (FDI) flows, mainly in extractive industries but also in the services sector. Zambia's mining sector has benefited from FDI, receiving almost US$1 billion in 2011 alone. The mining sector has suffered from legacy issues relating to historical public sector monopoly and a contentious privatization process. The Government of Zambia 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 deteriorating copper prices, reinvestments in Zambia's copper industry dwindled, productivity declined, compromising ZCCM's financial sustainability. The government decided to privatize the mining sector in the mid-1990s with a view to increasing productivity through foreign investment and private sector development. ZCCM assets were sold to private investors and ZCCM was transformed into an investment holding company, ZCCM-IH.

[36] Internalizing the Negative Externalities of Mining in Ghana: Should Corporate Social Responsibility Be Voluntary? Doku and Appiah-Kubi: Developing Country Studies; 2014.

Figure 2.2 Zambia Copper Production and Global Prices (2005-2014, quarterly figures)



4. GRZ has inherited enormous environmental liabilities accrued over 70 years of mining operations, due to poor economic performance in the 1980s and 1990s and an increasingly inadequate handling of environmental issues. Copper mining is a significant economic activity[37] and a powerful force in shaping the Copperbelt province, where the mines are concentrated. 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. However, a massive environmental mortgage accrued, due to past actions, needed to be addressed once the decision was taken to privatize mining assets. At the time of privatization, 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. The government made the strategic choice to retain the "environmental debt" and allowed commercial mining and smelting operations to continue with limited interventions and environmental due diligence. The generous incentives provided to the private mine operators was primarily a way of attracting viable investors by the government, whose bargaining power had been weakened due to low copper prices and a large debt burden equivalent to US$1 million per day. However, many old TDs have been left unprocessed by the new owners due to fluctuating copper or lead prices and low metal content, resulting in continued environmental pollution and exposure to neighbouring communities, causing significant environmental health.

5. **Current environmental health issues are due to continued poor environmental governance in mining sector**. The legacy from privatization**,** particularly the unclear and unresolved separation of historical environmental liabilities associated with the public mining operations of ZCCM from the current operations of the private owners is at the core of unattended

[37] Throughout the 1970s and 1980s, the copper industry was the second largest employer after the Government, and generated about 85 percent of foreign exchange earnings, 30 percent of Government revenues and 15 percent of GDP. Privatization was essentially completed in March 2000 with the conclusion of deals with: i) Konkola Copper Mines (KCM), involving Anglo American, the International Finance Corporation (IFC), and the Commonwealth Development Corporation (CDC); and ii) Mopani Copper Mines (MCM), involving Glencore International and First Quantum.

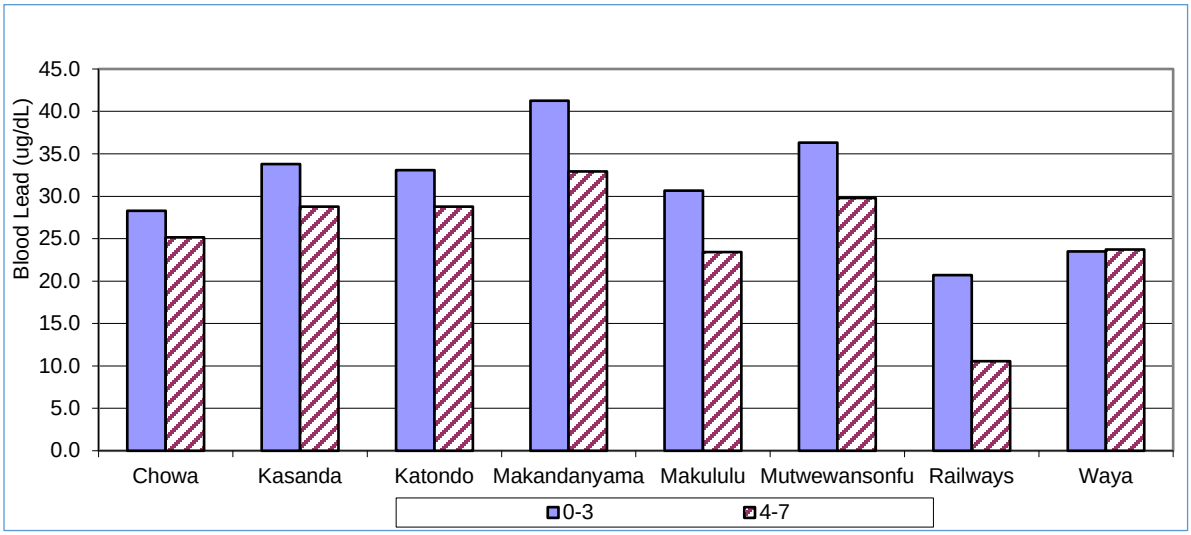
environmental health risks. The old and new environmental liabilities are now often inseparably mixed, many of liabilities and risks may have increased due to natural deterioration (e.g. of TDs in Kitwe due to poor maintenance or residential encroachment) or poor development decisions (e.g. permitting residential development on known contaminated land in Kabwe). At privatization, the liabilities were housed with what remained of ZCCM, namely with ZCCM-IH, who was tasked with responsibly managing these liabilities on behalf of GRZ. Partly due to the significant increases in commodity prices since privatization, ZCCM-IH has been successful in passing some of these liabilities (in particular those associated with old processed mining waste dumps known as TDs) onto new private investors, who see potential commercial value in the unused TDs. It is noted that with increases in copper prices, potential investors express interest in acquiring these dams for reprocessing. However, the MMMD, in line with the new MMDA, has been leasing/licensing these TDs to interested parties, without clarifying the responsibilities for the cleanup and permanent closure of these dams upon the completion of extraction activities or without specifying the date at which the lease would end. Due to fluctuating copper and lead prices, including low content in the tailings, none of the new owners have started reprocessing, thus leaving the lead and copper tailings unattended, resulting in continued exposure to the population of Kabwe town and various provinces of the Copperbelt respectively. Ownership of many of the TDs continue to remain in the hands of the government, which offers opportunity under the project to demonstrate rehabilitation/closure for reduction of environmental health risks.

6. **A lot of good work**[38] **was done under CEP but the residual environmental health problems in Kabwe are still serious due to widespread lead contamination.** Kabwe continues to have serious environmental health risks associated with lead exposure. It is estimated that more than 15,000 residents (including more than 3,000 children) may still be affected by high lead levels in the soil, both from naturally occurring mineralization and the impact of the smelting and reprocessing of tailings. Lead contamination[39] is particularly concerning for young children as it affects cognitive development and can cause serious health problems, including death in serious cases. The public health risks fall disproportionately on the poor, and in particular on the vulnerable population including the women and children who are exposed to toxic pollution and live in poor, degraded and abandoned mining areas. Closure of several old mines and mining operations resulted in unemployment, loss of livelihood and income generation opportunities. The situation has led to higher health risks due to continued exposure to toxic lead pollution, particularly for poorer and malnourished children and their mothers, exacerbated by poor access to proper diagnostics, care and treatment.

[38] The CEP funded 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).

[39] Exposure to lead has many known health effects, which include neuropsychological impacts in children (developmental and behavioral problems, lower IQ, attention deficit disorder, learning problems, and anemia) and increased blood pressure and cardiovascular disease among adults, chronic kidney disease, anemia and gastrointestinal symptoms. Anemia and gastrointestinal symptoms generally occur at high blood lead levels (BLL), e.g., greater than 60 micrograms of lead per deciliter of blood (μg/dL). The residual environmental health problems in Kabwe are still serious due to widespread lead contamination. It is estimated that tens of thousands of residents (including more than 3,000 children) may still 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. Air pollutants, such as SO_2 have a correlation with respiratory problems. Children, the elderly and those already suffering from respiratory ailments such as asthma are especially at risk.

Figure 2.3: Blood Lead Geometric Mean by Age Group for Each Community in 2007

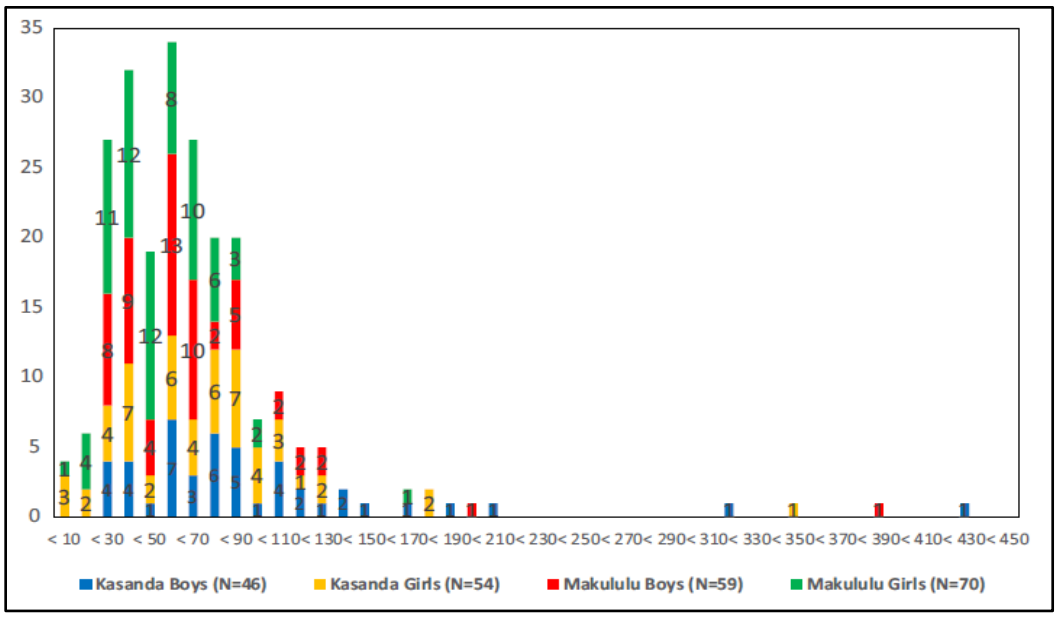


Source: Kabwe Scoping and baseline study, CEP

7. **The dominant exposure pathway for lead has been found to be airborne and from direct ingestion of soil and dust[40],** with extended pathways through groundwater or surface water and irrigated crops.[41] The WHO benchmark for BLLs is below 10 µg/dl and it has been estimated that each 10-20 µg/dl in children represents about two points on population IQ. Lead pollution is considered a "silent killer", in that it takes a long time to develop symptoms like anemia, abdominal pains and seizures, which are not very specific. High lead levels is known to result in many known health effects, which include neuropsychological impacts in children – developmental and behavioral problems, lower IQ, attention deficit disorder, learning problems, language delay, anemia, damage to the nervous system etc.) and increased blood pressure and cardiovascular disease among adults, chronic kidney disease, anemia and gastrointestinal symptoms. There is no known lower BLL threshold below which there are no neuropsychological impacts in children, impacts on blood pressure and cardiovascular disease among adults, and impacts on renal functioning (e.g., kidney disease). Anemia and gastrointestinal symptoms generally occur at high BLL, e.g., greater than 60 micrograms of lead per deciliter of blood (µg/dL).

[40] Lead exposure from soil in Peruvian mining towns: a national assessment supported by two contrasting examples: Green et al; 2012.
[41] Linking Geological and Health Sciences to Assess Childhood Lead Poisoning from Artisanal Gold Mining in Nigeria: Geoffrey S. Plumlee, et al Environmental Health Perspectives; June 2013.

Figure 2.4: Histogram Showing BLL Accumulation Trends in Children[42]



8. Although acute lead poisoning of young children has been the most immediate and severe consequence, older children, adult workers, pregnant women and their unborn children, and breastfeeding infants are also at risk. A study of maternal blood and umbilical cords showed a high correlation between BLLs of mothers (41.2µ/100mls) and infants (37 µ/100mls) indicating that the infants were exposed to unusually high lead levels during their fetal lives.[43] Data extracted and compiled from various studies undertaken by University of Zambia in collaboration with Hokkaido University and clinical conditions data collected by ZCCM-IH in the most polluted catchment areas of Kabwe, indicate the direct association between high BLLs and health impacts.

[42] Histogram showing BLL accumulation trends in children from Kasanda and Makululu townships of Kabwe – extracted from Lead poisoning in children from townships in the vicinity of a lead–zinc mine in Kabwe, Zambia: John Yabe et al 2014.
[43] The sources of lead poisoning and its effects on children living in the mining community of Kabwe, Zambia; A.R.L Clark, London School of Hygiene and Tropical medicine; 1975.

Table 2.1: Compiled Datadata of BLL in Children and Associated Health Impacts

	Chowa	Kasanda	Makululu
Sample size (number)	**70**	**100**	**127**
Sex			
Male (percent)	31	46	47
Female (percent)	64	54	53
Age (range in years)	3-6	1-7	0,6-7
Born in Kabwe	46	44	95
Mean BLL µg/dL	***39.0***	***82.2***	***57.1***
Clinical conditions in the past 1 year			
Headaches	70	84	11
Seizure/Convulsion	0	21	3
Anemia	0	12	0
Sleep problem	7	5	11
Intermittent abdominal pain	56	95	9
Memory problem	24	14	7

Source: Data extracted and compiled from BLL data collected by University of Zambia in collaboration with Hokkaido University and clinical conditions data collected by ZCCM-IH; while the townships are the same and the sample size is the same, the sample groups may differ.

9. A study done in 2013[44] for Kabwe 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.[45] Average lead concentrations in cattle from Kabwe area was 90.6+/-67.6 µg/kg dry weight suggesting prominent toxicological effects and the study demonstrated that lead contamination causes immunological alterations in cattle blood, both in vivo and in vitro.[46] Certain types of plant species are capable of acting as lead pollution pathways, but the quantity of lead uptake varies according to type of plant and species and different root systems and amount of soluble lead available. Root crops tend to generally contain more lead than leaf or fruit crops. Even in areas, like Kabwe, where there is relatively low levels of soluble lead, atmospheric lead pollution is a major contaminator of food crops, particularly maize, which is the primary staple food crop and often grown in backyards.[47]

10. The maximum values of Cadmium and Arsenic in Kabwe were 18.7 and 51.5 mg/kg dry-weight, respectively. These concentrations could have potential for poisoning, as the trigger values are higher than internationally recommended guidelines (USEPA: 35 mg/kg dry weight in sediment and 10.0 mg/kg respectively).[48] Lesser but still significant (and problematic) pathways include consumption of water and contaminated foodstuffs. Soils used to make adobe bricks (from ore washing areas) also have the potential of having lead levels as high as 58,900 ppm.[49] In Zambia, there is a cultural or time-worn tradition whereby pregnant women ingest soil (or other substances such as dirt, clay, ashes, etc.) which adds to the blood lead levels and also has a secondary impact on infants. A recent study revealed the presence of large quantities of lead and

[44] By the University of Zambia in collaboration with Hokkaido University.
[45] Metal distribution in tissues of free-range chickens near a lead-zinc mine in Kabwe, Zambia. Yabe et al, Jan 2013.
[46] Effects of Environmental Lead contamination on cattle in a lead/zinc mining area: Ikenaka et al, Department of Toxicology and Chemistry, 2012.
[47] Concentration of some metallic pollutants in the Zambian Environment: Determination of concentration of Cadmium, Copper, Zinc and Lead in soils and vegetation around Kabwe: Backsion Tembo; 1993.
[48] Heavy metal contamination of soil and sediment in Zambia: Ikenaka et al; October 2010.
[49] Ibid.

cadmium in edible organs of free-range chickens in Kabwe, with mean concentrations of 7.62 mg/kg and 3.51mg/kg respectively (exceeding the maximum recommended level of 0.5mg/kg of lead in offal for human consumption and 1.0mg/kg of cadmium in chicken kidneys).[50] Consumption of contaminated chicken can pose significant health risks to humans, especially children, who are highly susceptible to lead toxicity. Mean lead levels in liver and kidneys of cattle in Kabwe was found to be 0.42mg/kg and 0.58mg/kg (dry weight) respectively.[51]

11. According to the Center for Disease Control (CDC), the first step in treating all degrees of lead poisoning is to remove the source of the contamination. Testing is required to confirm levels of lead in the blood level, while health impacts are related to the extent and duration of lead exposure. Medical interventions and treatments are based on the BLLs, and Chelation therapy is considered a mainstay in the medical management of children with BLLs > 45μg/dL. However, Chelation therapy will only work with remediation (otherwise the population continues to live in a contaminated environment and ingest lead).[52] The CDC advises that neurodevelopmental monitoring should continue long after a child's BLLs have been reduced.[53]

12. **Copper smelters associated with sulfur dioxide (SO_2) emissions have adversely impacted soil quality and crop productivity in Copperbelt province.** Project activities will also be focused on the Copperbelt – primarily Chingola, Mufulira and Kitwe – to address the adverse environmental impacts which are directly linked to operating copper mines. Particulate matter less than 10 μm in size (PM10) originating from smelters, and dusting of TDs and unpaved roads have left significant environmental impacts resulting from exposure to acidic fumes. It is estimated that in the early 2000s, the total SO2 emissions in Zambia was 346,700 ton/year, of which the mining industry (mostly the copper smelters) contributed to over 98 percent. Areas northwest and west of the large Nkana and Mufulira smelters have SO2 concentrations between 500 and 1000 μg/m, which exceed the Zambian guideline of 50 μg/m3.[54] This is the case with most residential areas in the Copperbelt cities of Mufulira and Kitwe. A study of SO2 concentrations in flue gases and on the bark of the Australian red cedar in the Copperbelt showed levels of 1,402 μg/m3 in raw flue gases (exceeding the threshold value of 1,000 μg/m3) at almost 25 km away from the emissions source.[55] Copper smelting activities on the Copperbelt result in atmospheric emissions between 300,000 and 700,000 tons/year, far exceeding the WHO limit of 125,000 tons/year.[56] Surface soil samples contain many times higher concentrations of copper than subsurface samples in most of the Copperbelt.[57] Recent incidents of accidental breaks in leaching tanks of mining companies resulted in over 100 hectares of maize and vegetable crops being destroyed by SO2 emissions along the Kitwe-Chingola roads on the Copperbelt.[58] Root crops tend

[50] Metal distribution in tissues of free-range chickens near a lead-zinc mine in Kabwe, Zambia: John Yabe et al 2012.
[51] Uptake of lead, cadmium, and other metals in the liver and kidneys of cattle near a lead-zinc mine in Kabwe, Zambia: John Yabe et al 2011.
[52] Lead Poisoning Crisis in Zamfara State, Northern Nigeria: Medecins Sans Frontier.
[53] CDC: Managing Elevated Blood Lead Levels Among Young Children: Recommendations from the Advisory Committee on Childhood Lead Poisoning Prevention.
[54] Towards better environmental management and sustainable exploitation of mineral resources : Joanna Lindahl; Geological Survey of Sweden, July 2014.
[55] Air Pollution on the Copperbelt Province of Zambia: Effects of Sulfur Dioxide on Vegetation and Humans: Ncube et al; School of Mines and Mineral Science, Copperbelt University, 2012.
[56] Ibid.
[57] Ibid.
[58] Lusaka Times, January 2013.

to generally contain more lead than leaf or fruit crops. In the less contaminated areas of the Copperbelt, only leaves of cassava and sweet potato contain elevated metal concentrations. However in heavily contaminated soils, even the roots showed high metal concentrations. People residing in some areas in Kitwe on the Copperbelt are unable to grow backyard vegetables gardens, which are being affected by necrosis due to accumulation of heavy metals in the soil and SO2 on plant leaves.[59] The project will explore interventions to demonstrate livelihood opportunities and treat soils in areas affected by SO_2 contamination.

13. **There is a potential risk of catastrophic failure of old and unstable TDs, which could cause extensive physical and ecological damage.** In 2006, failure of tailings slurry pipeline upstream resulted in release of highly acidic tailings into Kafue river, which resulted in high concentrations of copper, manganese, cobalt in the water and the shutting down of drinking water supply of communities downstream.[60] An underground breach of a tailings dam at the Mufulira Mine in 1970 caused nearly 1 million tonnes of tailings to fill the mine workings killing 89 miners.[61] A recent audit of 15 old TDs has found that almost all of them are in a state of disrepair, liable to severe tailings spills due to erosion of their outer slopes and insufficient vegetation and maintenance.[62]

14. **Lessons from the CEP (2003-2011), demonstrate approaches to reasonably address**[63] **some of the environmental health risk** resulting from poor environmental governance in mining sector in 1990s. As the ICR concluded, it is extremely important to have multipronged approach – while focusing on actual remediation and capacity building for planning, monitoring and management is important to sustain results on the ground, it is equally important to enhance regulatory capacity, enforcement and sector reforms for improving financial sustainability of environmental externality in mining sector. Many lessons from the CEP that helped in remediation of defunct mine plant sites and hazardous TDs, including disposal of hazardous materials (such as uranium and PCB) from a few mine sites and TDs, are replicable and scalable. The project was designed to demonstrate through ZCCM-IH an approach to address environmental liabilities that were considered an impediment to both (i) future investments in the sector as part of Zambia's privatization process and were therefore housed within ZCCM-IH; and (ii) Government's economic development plans. In Kabwe, which was the focus of much of the CEP's activity the project implemented a comprehensive set of complementary activities aimed both at treating children with elevated lead levels as well as preventing recontamination by reducing lead exposure in children's living, learning and play environments and through behavior modification. Lead testing of children conducted upon the completion of treatment in project areas confirmed that the treatment effectively reduced children's lead levels below the treatment threshold established by the project. The IEG review of the CEP ICR rated the development outcome of the project as moderately satisfactory, noting that "while the project's support enhanced the powers of the

[59] Lindahl: Czech Geological Survey 2007.
[60] Nchanga, Chingola: World Information Service on Energy.
[61] Tailings.info.
[62] SRK Consulting.
[63] 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 damsTDs and two overburden dumps were repaired and their potential health and environmental risks reduced.

environment regulatory institutions, evidence of strengthened capacity remained limited" (IEG, 2013). The project's community outreach and risk awareness campaign contributed to several positive outcomes but the level of community awareness and strong concern about environmental health risks due to exposure to lead (particularly in Kabwe), was found to be relatively lacking. Many planned project activities under CEP were not completed satisfactorily due to the expected second phase of the project. It was anticipated that a follow-on project would address priorities that were not undertaken by the CEP due to time, funding or implementation capacity constraints, as well as new priorities that emerged from CEP-funded technical studies. Incomplete project activities also included maintenance and repairs of TDs and dumps, such as repairs of decant, clearing of drainage channels, gullies that were considered a security risk.

15. **There is an opportunity to undertake remediation of critically contaminated site in Kabwe and Copperbelt province that would help reduce the exposure to toxic pollutants**. The current environmental health issues in Kabwe and Copperbelt province could be addressed through a combination of policy, technical and institutional approaches, including improved accountability and delineation of responsibility about risks; ability to monitor and enforce environmental and mining regulations and standards; and strengthening public reporting and disclosure of relevant information. In addition to remediation of some known hotspots of toxic contamination in Kabwe and Copperbelt province, there is significant room to improve and further enhance the institutional capacity to monitor and enforce environmental and mining regulations and standards, particularly the ZEMA, MSD and KMC. There is an opportunity to strengthen and empower communities to demand better environmental quality while improving alternative livelihood opportunities.

16. **The project will also build upon some of the policy achievements which were initiated under CEP.** These included establishment of an EPF[64] for two principle reasons: i) to provide assurance to the MSD that a person who holds a license or permit issued under the MMDA shall execute the EIA; and ii) to provide protection to the Government 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. The EPF will be strengthened to function similarly to an escrow account where each mining company's contribution to the fund is earmarked for use against environmental liabilities on their own license areas. An effective operationalization of EPF will ensure that mining companies will fully internalize the environmental costs of their own mining operations. The other major achievement of CEP included the new Environmental Management Act of 2011 that can be strengthened with specific regulations and procedures for addressing environmental liabilities.

B. Beneficiaries

17. The project will benefit communities, especially the poor and vulnerable, living in contaminated areas affected by mining activities. The interventions will target about 500 women and unemployed youth in these communities through direct support for income generating activities and enhancements of livelihoods using a community based approach in order to reduce their current exposure to hazardous employment activities. Project beneficiaries will also include more than 3,000 children who have been impacted by lead pollution in Kabwe, through direct

[64] The EPF is managed and administered by an Environmental Protection Fund Committee, which consist of four government officials responsible for environmental matters and seven representatives of mining companies. The Director of the Mines Safety Department (MSD) chairs the EPF Committee.

health interventions including blood lead level testing, treatment and nutritional supplements. In Kabwe, remediation activities and management of contaminated hotspots will benefit around 70,000 people living in hotspots and an estimated 30,000 children will be beneficiaries of education and awareness building campaigns. Project interventions to reduce the impact of SO_2 on soil quality and agricultural productivity will indirectly benefit more than 1,000 farmers in Mufulira. Through enhancement of skills, testing and environmental monitoring facilities, the project will strengthen capacity of regulatory authorities in monitoring of environmental and mining regulations compliance, which will have longer-term benefits for the country.

C. Project Activities

The Project includes the following components:

Component 1: Remediation of Contaminated Hotspots and Improvement of Environmental Infrastructure (US$29.6 million)

18. The component will finance specific remediation activities and associated environmental infrastructure in Kabwe and Copperbelt provinces. These would be prioritized based on a standard set of social, environment and economic criteria including assessment of environmental health risks. The proposed investment activities under this component are designed to address immediate and medium term environmental health priorities from sites that are known to pose risks to neighboring population. This component will finance early no-regret investments to remediate contaminated hotspots that pose immediate health risks to the community and which can commence in the first two years, while developing a long term approach for appropriate remediation planning. A simple and straightforward methodology will be supported under the project for evaluating and comparing sites, for assessing environmental health risks and for prioritizing cost effective interventions. Opportunities to collaborate with the private mining companies in legacy clean-up operations will be explored. Some of the key investments include:

Subcomponent 1.1: Remediation of contaminated hotspots and Improvement of Environmental Infrastructure (US$11 million)

19. This will include identification, characterization and remediation of known hotspots of contamination in Kabwe and other locations, primarily sites that are in the proximity of the communities including a voluntary in-situ remediation program for households that are highly exposed. An appropriate technique using a combination of preventive and curative approach would be used, such as confinement; containment; removal of polluted soils or in-situ treatment techniques. A consultative and voluntary approach would be used to prevent any displacement or land acquisition.

20. The focus is on environmental infrastructure designed to improve the environmental health of the surrounding environment. Given the poor management of hazardous and solid waste that contributes to exposure to contaminated material, there was a strong demand from community stakeholders in Kabwe and other locations for environmental infrastructures that would reduce their exposure to contaminated material. A consultative and participatory process indicated the preference for two critical needs a) improving the drainage and flow through engineering interventions of Kabwe canal. The canal, which passes through the heavy residential area gathers

substantial amounts of hazardous lead bearing material and wastes from the closed mining areas upstream. The canal, due to poor hydrological flow, often floods resulting in overflow of the lead-bearing sediments into the backyards of the neighboring residential areas; and b) Improving the management of hazardous and solid waste in Kabwe, which would allow safe disposal of lead bearing materials and prevent recontamination. Specific investments include developing a waste management landfill facility, which will allow scientific disposal and recycling of solid waste and also disposal of hazardous waste material planned to be removed from various hotspots and Kabwe Canal. The feasibility of these engineering interventions will include analysis of alternative locations, design and associated environmental and social impacts. The subcomponent will also explore the applicability of results-based financing approaches for Kabwe waste management investment.

Subcomponent 1.2: **Rehabilitation of TDs and Mine Closure in Copperbelt Province (US$18.6 million)**

21. This component will assist the GRZ to address some of its accrued environmental liabilities, by piloting closure of a few old TDs. This would be the first time such closure will be undertaken in Zambia and will allow the demonstration of technical, economic, and institutional feasibility. The choice of the TDs would be determined by GRZ during Year 1 of project implementation using an agreed criteria of ownership[65]; immediate environmental health impacts and costs to communities; economics of closure; and potential benefits and future use. A simple and straightforward methodology will be developed and utilized under the project for evaluating and comparing sites during sites identification, assessing environmental health risks and for prioritizing cost effective interventions. A risk assessment of identified TDs supported by a Disaster Risk Management Plan would be key for determining specific interventions. Opportunities to collaborate with the private mining companies in legacy clean-up operations will be explored. It was proposed the project would demonstrate closure of TD 8 and TD 10, which are owned by the Government, as a model for closure of mine tailings. However, the final choice will be confirmed based on above mentioned criteria.

Component 2: <u>Enhancing Institutional Capacity for Environmental Governance and Compliance</u> (US$13.5 million)

22. This component will strengthen the environmental governance in mining sector and compliance through a variety of interventions a) policy support to the MMMD to improved effectiveness of EPF; b) strengthening the capacity of MSD to implement the MMDA that has shifted new responsibilities to MSD, including assessment of environment health risks, and inspection of mine safety risks to communities; c) building capacity of the RPA to improve identification and mapping of health risks in critical residential areas where exposure to radioactive material (i.e. Uranium) may be high; d) strengthening the capacity of ZEMA to improve effectiveness of monitoring, compliance, enforcement; and e) through government and the Zambia EITI, improve disclosure of environmental information and public awareness of mining-environmental governance issues.

[65] Project funds will not be used to subsidize or remediate private sector environmental or social liabilities.

Subcomponent 2.1: Improving environmental governance in the mining sector (US$6.5 million)

The subcomponent will comprise two broad activities:

23. **Enhance Mining-Environmental Governance and Operationalize Environmental Surety Mechanisms for Mine Closure.** In 1998, the Mines and Minerals Regulation was enacted, which led to the development of the EPF (Special Instrument No.102), the current mechanism to provide financial surety for mine closure in Zambia. The objective of the EPF is to assure that mine developers execute the environmental impact statement and mine closure plans in accordance with the Mines and Minerals (Environmental) Regulations 1997 and to assure funds for the rehabilitation of mining areas are available if the holder of a mining license fails to rehabilitate the area. The EPF is managed and administered by a committee that consists of a mix of government officials responsible for environment and representatives of mining developers. In 2008, the Mines and Minerals Act (1995) was replaced by the MMDA Act No. 7 whose main feature was the removal of the Development Agreements (DA) and changes to the mineral royalty. There was a recent amendment - No. 15 of 2015 - which introduced honorary inspectors to strengthen the enforcement of the act and its subsidiary regulations. The EPF regulations have not been revised since 1998 and the EPF has not been fully operationalized. Improving the EPF's operationalization will help delineate roles and accountability for past, current and future environmental and environmental-health risks from mining operations; accounting for financial resources needed to meet government obligations to address environmental health risks and liabilities; and clarify the distinction between government-owned liabilities verses private sector responsibilities to regularly and progressively address environmental problems by financing the costs of their mitigation.

24. This subcomponent comprises a combination of interventions involving policy support; strengthening mining and environmental regulations; capacity building support to assist the mining sector agencies, including MMMD, MSD and RPA. The component will strengthen operational effectiveness of the existing EPF, including mechanisms to identify, finance, implement and monitor feasible environmental and social measures for prioritized contaminated hotspots related to past, present and future mining operations. The capacity of MSD will be strengthened to enable it to implement its new responsibilities under the MMDA, including assessment of environment health risks; providing guidance to mining companies on mine closure and progressive maintenance of TDs so as to minimize risks to the neighboring communities. The RPA would be assisted to improve identification and mapping of health risks in critical residential areas where exposure to radioactive waste material may be high.

25. The component would assist the MMMD come up with mining regulations supporting the 2015 MMDA that will be used to arrive at informed decisions that will ensure mine developers have sufficient funds and resources to complete rehabilitation of their mine areas at closure of the mine. The component would also assist the Ministry of Environment and ZEMA to develop regulations to support the Environment Management Act (EMA 2011). The policy support would involve review of the EPF regulations with a view of identifying gaps and weaknesses in the legislation: i) Identify any omissions, inconsistencies or errors; ii) assessment of the performance and effectiveness of the EPF from its inception in terms of contributions to the fund, securing of bonds and investment of funds; iii) assessment of accuracy of the EPF closure cost calculation guidelines applicable to Zambian conditions; assess the criteria of allocating EPF performance

categories. This support would help set up a mechanisms on how to conduct and compile an EPF audit report for mining operations in Zambia; engagement of key stake holders on improvements to be made on administering of the EPF requirements; and suggest measures to strengthen the regulations. This activity will include:

(a) Develop regulations to support the EMA 2011 and the MMDA 2015; develop mine closure regulations and update the Explosives Act and Regulations; make amendments to the MMDA (2015) and EMA 2011) to support project objectives and harmonize the two Acts and mandates of both ZEMA and MSD;

(b) Review the EPF regulations to, among other things: (i) ensure that issues relevant to mining and exploration right holders (large scale, artisanal, small scale and exploration rights) are adequately incorporated and appropriate for the scale and stage of operation; (ii) review the forms of allowed environmental surety provided in the EPF against risk along a mine's life for different types of mining assets; (iii) review relevant legislation and identification and removal of constraints to effective operationalization of the EPF; (iv) strengthen links of the EPF to license tenure management and approval of licenses; and (v) review the institutional structure of the EPF including models for its governance and financial sustainability;

(c) Develop protocols and procedures under relevant legislations such as: (i) guidelines for continuous rehabilitation of environmental liabilities; (ii) checklists for monitoring and enforcement of EIA provisions for various mines; (iii) procedures to delineate historical and current liabilities and environmental-health and safety risk based prioritization of liabilities; (iv) guidance for independent valuation and audit of environmental liabilities and mine closure reports under the EPF; and (v) elaboration of technical and financial criteria to obtain mineral rights to certain types of mining assets from exploration to production and tailings facilities;

(d) Undertake a legal and regulatory review and devise an action plan following the delineation of roles and accountabilities for past, current and future environmental health risks from mining operations and map this against (i) the potential environmental-health to the public and natural environment; and (ii) financial risk to the state;

(e) Review international good practices with respect to benefit distribution from extractive industries and propose regulation to support the MMDA 2015.

26. **Capacity Building in MSD:** Ensuring good sector governance requires not only good sector knowledge and legal frameworks; but also the capacity to (i) address the gaps identified; (ii) enforce effective implementation of regulations; and (iii) monitor industry's compliance. Capacity is best built in incremental steps, and on a long-term basis; but as an immediate measure, and in order to maximize project outcomes, capacity will be built in relevant institutions to address some of the gaps in monitoring and enforcement of legislation, compliance with environmental impact assessments, mine closure plans and other agreements that government may have with mining companies that relate to environmental and social obligations. Training will involve capacity building in order to enable the GRZ to effectively implement its mandate under the MMDA, 2015 and other obligations associated with the sector, such as evaluating and enforcing compliance with environmental and social obligations (either contained in legal agreements or in

environmental management and closure plans); industrial health and safety obligations; and other industry standards. Ensuring good sector governance requires not only good sector knowledge and legal frameworks; but also the capacity to identify gaps, enforce regulations and monitor compliance. Capacity is best built in incremental steps, and on a long-term basis; but as an immediate measure, and in order to maximize project outcomes, capacity will be built in relevant institutions to address some of the gaps in monitoring and enforcement of legislation, compliance with environmental impact assessments, mine closure plans and other agreements that government may have with mining companies that relate to environmental and social obligations.

27. Specifically, the capacity of MSD would be strengthened by developing guidance for mining companies on mine closure and progressive maintenance of TDs so as to minimize risks to the neighboring communities and the natural environment. The assistance would include - strengthening the capacity of MSD and ZEMA to critically review the Environmental Management Plans, mine closure plans, as well as techno-economic feasibility of mining projects; and assist the MMMD to improve negotiation with mining companies with respect to environmental and social provisions contained in subsidiary agreements to the development agreements. Activities would include:

(a) Developing operational standards and procedures for mine projects' inspection, enforcement, monitoring, reclamation and closure, including methods of financial assurance to ensure compliance;

(b) Development and dissemination of Codes of Practice to enable mine operators to comply with emergent environmental and mining regulations;

(c) Building (i) staff capacity for regular monitoring and inspections using appropriate equipment; (ii) staff capacity to manage cases; and (iii) systems for collection of information and integrated tracking of performance by license holder;

(d) Increasing MSD and ZEMA's capacity to develop high quality EIAs and Social Impact Assessments (SIAs) and to address disputes/grievances including setting-up robust monitoring systems of implementation of mitigation measures; and

(e) Developing internal audit functions.

28. **Increasing Awareness of Mining-Environmental Governance Issues.** Building broad based support for improved environmental performance by mining companies requires increased awareness and engagement in sector issues by the general public and policy-makers. The activity will provide support to the MMMD, Zambia EITI (the secretariat and the multi-stakeholder group) and capacity building of civil society organizations regarding mining-environmental health and mining-environmental governance issues. This will be achieved through the:

(a) Production of reports and publications to increase transparency on total mining environmental liabilities in Zambia and status of the Environmental Protection Fund;

(b) Carrying out of training to increase civil society and industry's understanding of the extractive industries challenges and environmental-health risks and to inform their involvement in the governance of the extractive industries sector;

(c) Develop and help implement a national strategy to communicate to the public risks to health and the environment from pollution, based on the best scientific knowledge;

(d) Sensitize the public, particularly those members living in close proximity to mining areas, about the dangers of disused mine workings and dump sites, exposure to contaminated soils and water, explosives and effects of environmental degradation or impacts associated with mining activities; and

(e) Sensitize parliamentarians about the effects of mining on the environment and human health as well as international good practices.

29. Equipment and facilities: In carrying out its mandate to oversee the safety and welfare of workers, MSD is required to conduct various tests and examinations under law. As MSD does not currently have the capacity (equipment or training) to conduct the tests and examinations required. In order to ensure that some minimum level of testing is carried out, accredited private institutions have been appointed. However, due to a lack of equipment, facilities and capacity, the MSD has no means of checking the results of the accredited institutions. As accredited institutions are performing services on behalf of mining companies, the arrangement raises moral hazard issues due to the principal-agency problems. As both the accredited institutions and the mining companies know that the government lacks the capacity to verify test results, it is possible that test results (and subsequently mine and public safety) could be compromised. Activities would include:

(a) A review of risks and issues of the current institutional arrangements (i.e. outsourcing of lab functions) for sampling and testing;

(b) Review the feasibility of upgrading the quality of laboratory testing services within ZEMA's and MSD's facilities against fostering the development of a credible environmental standards-setting and monitoring system reliant on private laboratories and services; and

(c) If warranted, preparation of market surveys, feasibility studies, business plans, and related facility improvement programs to identify priority investments in equipment and upgrading of facilities to allow MSD and ZEMA to carry out their mandates in relation to the mining sector.

Subcomponent 2.2: Improving environmental compliance, enforcement and public disclosure of ZEMA (US$7 million).

30. This activity will support investments for enhancement of monitoring, enforcement and reporting mechanisms for environmental compliance for pollution control within ZEMA. This will include (i) comprehensive capacity building program for ZEMA and other stakeholders, including strengthening capacity of national legal system, developing manual for environmental auditing and developing standards and legislation enhancement of monitoring; (ii) establishment and testing the engagement of the locally based honorary environmental inspectors; (iii) upgrading and providing critically needed new equipment; and (iv) operationalization of the Permanent Environmental Fund (PEF).

31. The ZEMA was established under the EMA 2011 succeeding Zambia Environmental Council. The primary role of ZEMA is to advise on policy formulation and recommendations for the sustainable environmental management; ensure the integration of environmental concerns in overall national planning through co-ordination with appropriate authorities; review environmental impact assessments and issue environmental licenses; monitor trends of natural resources, their use and impact on the environment and make necessary recommendations to the appropriate authority; and publicize information on any aspects of the environment and facilitate public access to information on the environment. Since the time of its establishment, the ZEMA has been facing a number of challenges of fully meeting its mandate, including lack of human and technical capacity, limited presence at the province level, and inadequate laboratory capacity for environmental monitoring. The project would assist ZEMA in the following specific areas:

(a) Enhanced environmental monitoring, enforcement and reporting mechanisms on environmental compliance for pollution control

32. ***Capacity building program:*** The Project will support ZEMA in updating the existing environmental monitoring program. Such program will target ZEMA's capacity to review ESIAs, negotiate ESMPs with investors, issue pollution permits, monitor compliance, and collect fees and fines. The initial steps for rolling out the program will include a comprehensive capacity building effort for all stakeholder levels to (1) increase the skills environmental monitoring, auditing, risk assessment, impact assessment, and related procurement; (2) provide tailored field training; (3) offer internships in reputed Universities for junior staff; and (4) develop and showcase several case studies on best practices in environmental management in the region. The capacity building program will include strengthening of the legal system for environmental enforcement with proposed judiciary training and study tour of a green court system.

33. ***Honorary environmental inspectors:*** One of the strategies to address lack of human resource capacity adopted by the Agency is the introduction of a system of honorary environmental inspectors. This initiative aligns well with the context of proactive GRZ decentralization, where a number of functions previously residing with the national government are delegated to the District level governments. In case of ZEMA, however, the monitoring and supervision functions are not envisioned to be devolved in the next several years. Therefore the ZEMA has proposed the use of honorary inspectors for monitoring and information collection at the local level. The Agency will nominate and train a number of honorary inspectors, which will be selected from a pool of existing local government officers who will be tasked with performing specific monitoring functions, such as ambient air standards; surface water quality standards; noise standards; EIA regulations; and extended producer responsibility regulations. Several municipal councils have expressed readiness to commence the honorary inspectors program in the first year of Project implementation, especially the areas suffering from ongoing industrial pollution issues, such as Kabwe, Chingola and Mufulira.

34. In order to operationalize the system, in the first year of the Project implementation, ZEMA will prepare procedures for appointment and modalities of operations of honorary inspectors and develop and roll out a comprehensive training program for the inspectors and ZEMA staff to provide guidance on technical aspects of monitoring, reporting mechanisms, and assignment of responsibilities. The training will incorporate the use of modern information tools and GIS based techniques for effective inspection and compliance management.

35. ***Equipment for environmental monitoring:*** To improve its laboratory testing capacity, ZEMA will procure environmental monitoring equipment to enable the selected local authorities, participating in the honorary inspectors program, to carry out environmental monitoring activities. Such equipment will include hand held air monitoring equipment; onsite/portable water monitoring equipment; and specialized Personal Protective Equipment (PPE) like ionizing radiation protective clothing and detectors. During the initial stage of implementation, the specificity of equipment and locations for use will be further examined and agreed by ZEMA, MSD and RPA in order to avoid redundancy and maximize the efficiency of the investment. District level provision of equipment will be supplemented by procurement of two pollution monitoring caravans, to be stationed in Lusaka and Kitwe. ZEMA has prior experience operating such mobile monitoring units and will borrow from the lessons learned of using such caravans under the CEP project to ensure all procured equipment includes provisions for maintenance and a sustainability plan to support the functionality beyond implementation period.

36. ***Public information disclosure:*** Building a broad support base for improved environmental performance by mining companies requires increased awareness and engagement in sector issues by the general public and policy-makers. ZEMA will work on increasing access to environmental information by establishing a system for enhanced data collection and information provision to the general public, private sector and decision makers. An online Central Environmental Management System (CEMS) and an Environmental Information Registry will be developed that will serve as a central repository for ZEMA policies and procedures, environmental licenses, EIAs, and will also provide access to relevant government ministries and agencies (e.g. MSD, , MOH, RPA and relevant NGOs) to share their public environmental information with ZEMA and the other stakeholders. The activity will also provide support to Zambia EITI regarding mining-environmental health and mining-environmental governance issues.

(b) Operationalization of ZEMA Permanent Environment Fund

37. Following the piloting of the Interim Environment Fund under CEP, ZEMA is ready to proceed with formalization of the Permanent Fund, as stipulated under the EMA (Section 8). Such Environment Fund is dedicated to mitigate or restore environmental degradation and adverse effects on the environment; and facilitate research to further the requirements of environmental management and sustainable natural resource management. The Fund is distinct from the EPF established under the MMDA, and the Petroleum (Exploration and Production) Act, 2008 and does not apply to industries and activities covered by the EPF. Under the project, ZEMA will undertake measures to operationalize the Fund, including creating a register of the activities, industrial facilities or plants, undertakings or businesses which are likely to have adverse effects on the environment when operated in a manner that is not in conformity with good environmental practices. This measure will further assist ZEMA in mainstreaming improved environmental management performance at the national scale.

(c) Improved public access to information through enhanced environmental data collection

38. The project will support implementation of pilot projects to showcase the environmental management approaches within selected ministries and local government agencies. Such pilots

may range from EIAs for small infrastructure projects to investigative studies to identify and assess the levels of pollution in selected hotspots (e.g. Lukanga Swamp).

Component 3: Reducing environmental health risks through localized interventions (US$18.5 million)

39. The Municipal councils of Kabwe, Kitwe, Mufilira and Chingola would be supported in identifying areas where environmental health risks to residents relate to lack of environmental services, such as disposal of hazardous and contaminated solid waste material; access to clean drinking water; lack of medical interventions for children and women exposed to lead contamination; and loss of agricultural soil productivity due to acidic exposure from SO_2 emission from the past copper smelting operation. The project will also strengthen relevant training institutions, such as the Copperbelt University, and Kabwe based community-level NGOs to increase national capacity to address environmental (and social) issues associated with the mining sector. The outreach and capacity of citizen monitoring at the local level as well as management of public Information, Education and Communication (IEC) would be strengthened through municipal councils in Central and Copperbelt provinces. The component is also aimed to introduce income generation opportunities in contaminated areas that would enhance community involvement in addressing environmental health risks. A pre-agreed set of selection criteria will be used to identify and implement sub-projects, working closely with the private sector, particularly the mining companies in the project area to identify locally relevant livelihood activities that would enhance income generation opportunities. The component will support the efforts of intermediaries and pollution affected people in Kabwe and Copperbelt Province in community-based project implementation and management by providing financial and supervisory support to enhance their managerial and technical capacities. Specific attention will be given to women and vulnerable community groups in the target areas. The project will provide support to community groups in a form of capacity building and small grants to organize themselves around productive activities identified in partnership with the private sector in the area, the nature of which will be determined by the beneficiaries based on their demand. All activities will be relatively small, technically simple, and cost effective. Collaboration with the private sector on outreach, consultations and community stakeholder engagement will also be explored.

Subcomponent 3.1: Strengthening decentralized health interventions to reduce environmental health risks in Kabwe (US$6 million).

40. This subcomponent will be implemented by the Kabwe Municipal Council (KMC) in technical partnership with the MOH. It will include: i) assist local, district, provincial government hospitals and clinics to test potentially exposed population group based on existing data on health related to lead exposure in Kabwe; ii) evaluate data to strengthen the intervention strategy on health and education to prevent, diagnose and treat lead related problems in Kabwe; and iii) identify risk groups such as pregnant women, older children, scavengers in the targeted areas. This component will address the populations that are at risks from lead exposure by conducting integrated case management (analysis of blood lead levels, health education, exposure reduction, medical treatment). Treatment and nutritional supplements will be provided according to test results while health promotion shall also be conducted in the affected communities. The data from case management and results of interventions would be used to evaluate the remediation projects by comparing pre- and post-remediation lead levels; identify risk groups such as e.g. pregnant women,

older children, scavengers in the targeted areas to be included in the health intervention program. The project will support the development of a case based reporting system, a Monitoring and Evaluation (M&E) system and a data management system. Development and dissemination of guidelines and policy on lead and heavy metals management, Occupational Health and Safety and associated training will be supported under this component. Some linked activities are being financed under other components and the project will ensure that there is collaboration between the various agencies. This includes environmental monitoring being done by ZEMA (regional offices, honorary inspections with involvement of KMC) and public awareness activities being done by KMC, in collaboration with Ministry of Education and community based organizations, etc. The World Bank has recently approved a "Tuberculosis and Mining" project, which will support the environmental health and infectious diseases issues arising from employed miners and the mining companies.

41. The health sub-component will be implemented by the existing government health sector structures at provincial and district levels. The funding for procurement of goods, services and capacity building will flow through the KMC, including for costs of technical and advisory services to be procured from the MOH. The implementation arrangements will reflect GRZ Decentralization Policy specific to the local context in the project intervention areas. At provincial level, the health sector component of the project will be spearheaded by the provincial medical offices, while implementation will be done by the district medical offices, in close collaboration with KMC. There are 29 health centers in Kabwe, along with 2 hospitals – Kabwe General and Kabwe Mines. Health interventions, including testing and treatment will be supported through 4 health centers in hotspot areas, Chowa, Makululu, Kasanda, Katondo, and in the 2 hospitals. These centers and hospitals will be supported by procurement of equipment (test kits and lead-care analyzers) and medications and nutritional supplements. Capacity building and training will be provided to relevant staff in all 29 centers.

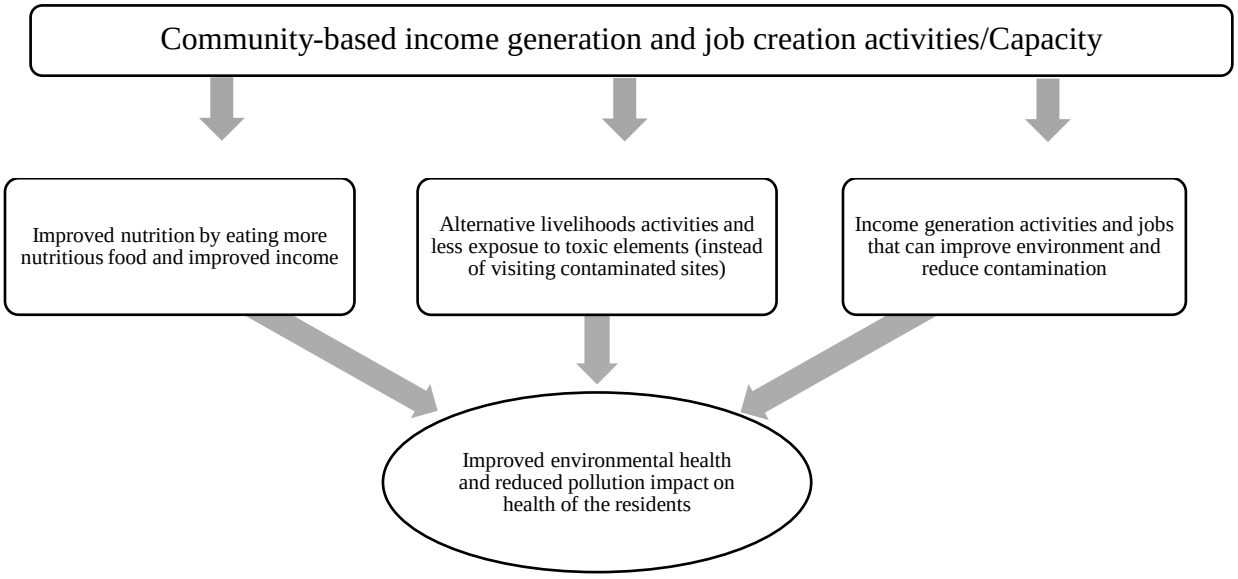
42. Database management, M&E and case-based management will be strengthened at the DMO level, in collaboration with the KMC. Funding for all procurement (services, goods, training) will be managed by KMC. It is expected that a project account for MOH will be established under the Designated Account of the KMC. The DMO, in collaboration with KMC will procure the equipment and medication required for testing and treatment of lead impacted population.

Subcomponent 3.2: Support to local income generation, livelihood and public awareness activities in four municipalities (US$11.3 million)

43. The objective of the subcomponent is to enhance local community involvement in addressing environmental health risks in Kabwe, Kitwe, Chingola, and Mufulira, by supporting community-based income generation and job creation activities in targeted areas, under leadership of each participating local council. The participating councils have identified most polluted settlements/wards as their target sub-areas under the sub-component, as well as potential community-based activities that can reduce environmental health risks and help local population benefit from enhanced income and job opportunities. These sub-areas are old mining towns or particularly contaminated areas where residents have lost jobs and income sources, and are severely exposed to health risks by pollution or acid rains that are caused by past and current mining activities. Based on stakeholder consultations, an unemployment rate in these areas is estimated to be about 75 percent. Residents, especially most vulnerable members are more exposed

and responsive to these health risks, because they live in a house with less protection, are in worse nutritional status, and have no choice but to visit contaminated sites to pick up scrap metals or wastes for living. The target beneficiaries of the sub-component therefore are the most vulnerable members living in the selected sub-areas, including female/children-headed households, people with HIV/AIDS or disabilities, unemployed youth, etc. The sub-component will provide extensive capacity building training and small grants to community-based organizations/enterprises, who will identify, plan, and implement productive activities, in close partnership with the municipalities, local line ministries, and other partner organizations including the private sector. The nature of the activities will be determined by beneficiaries based on their demand, but will need to meet the pre-agreed set of selection criteria to ensure financial, social, and environmental viability and relevance. More detailed strategies and procedures for the subcomponent are included and will be kept updated in the PIM.

Figure 5: Development pathways of the subcomponent 3.2 to the PDO



44. **Target areas in each municipality**: Each municipality has identified target sub-areas, based on the available budget and the objective of the overall project. These target sub-areas are particularly contaminated and polluted areas. The first potential sub-areas will be updated over the project implementation period, based on the needs and budget availability. The first indicative list of target areas and rationales for the selection are summarized below.

Table 5: Sub-target areas in each municipality/city*

Municipality	Indicative Target Areas/approximate population size	Rationale
Kabwe	Chowa (14,643), Kasonda (15,150), Kalondo (Makandanyama) (19,700), and Makululu (27,150). Total: 76,643	These four areas are particularly contaminated and polluted with lead, and the population is showing alarmingly high level of blood lead levels.
Kitwe	Kandabwe St. Anthony, Sailas.	These areas are next to mining operations – Mopani Mines. These areas include informal settlements and areas with poor living standards, areas prone to floods, acid rains, polluted mine dust/air and erosion (with poor soil texture).
Chingola	Nchanga (5,347), Sekela (5,604), Buntungwa (11,867), and Kalilo (6,034). Total: 28,852	Nchanga ward, Sekela ward, and Buntungwa ward: these are former mine townships with high solid waste problems. Kalilo ward (Mushishima, Shimulala, Helen, Hippo pool settlements): this ward is the most affected and polluted area.
Muflira	Kankoyo Township (targeting women and youth community based enterprises). 850 households with about 19,200 residents.	Kankoyo township is most exposed to mine air pollution in the district. Human and physical environments are more negatively affected.

*Population data is based on the census 2010

45. **Potential income-generation/job-creation activities**. At the stakeholder consultations during the project preparation with community members, line ministry officers, municipalities and local partners, several income-generation/job-creation activities were identified, preliminarily as potential and indicative productive sub-projects to be implemented in each municipality by local community groups under the sub-component. While, each activity will require screening using an established criteria, the indicative list include – restoration of agricultural of land contaminated by SO_2 through soil treatment, green houses and mushroom shelter rehabilitation for enhancing economic activities and food security**;** livestock activities; establishment of nurseries and tree planting for creating job in reclamation of mining areas and remediation of contaminated areas; community based greening activities etc.

46. **Communication strategy.** Each municipality is in the process of developing a strategic communication and awareness campaign to ensure target populations, including most vulnerable members, are informed and encouraged to participate in the project. The communication and educational campaigns will be conducted by the PIU (led by communication/public relations officers), in collaboration with the Ministry of Education and key line ministries. The initial communication will include: a) environmental and health risks of the areas, together with mitigation measures and what the residents can do to be less affected, and; b) project information include the objective, procedures, and eligibilities, etc. Sensitization/Communications will be channeled through traditional leaders, zone representatives, Ward Development Committees, and

existing CBEs working with target communities. The tools and mechanisms include: community radio, flyers, posters and announcement in strategic areas (e.g., water points, Community Health Centers), through drama groups, public address systems (PAS), mobile systems, schools and church groups, and door-to-door visits. Translation into local languages may be required and will be done as needed.

47. **Sustainability measures and linking with private/financial sectors.** Proposal development by CBEs will be facilitated/assisted by community development officers in each municipality, other partners including NGOs, and the project management consultant. Other relevant partners including the Zambia Development Agency will contribute to the sub-component by providing knowledge, networks, and training sessions to the community groups that aim at strengthening capacity, business profitability and sustainability of their activities. The possibility of creating revolving funds can be piloted in a small scale first, before being implemented in a larger scale. To ensure sustainability of investments under the component, the project will emphasize the following set of activities:

- Linking with other private sector partners and financial lending institutions;
- Continued capacity building, including in record keeping, saving culture, conflict management, good leadership, financial management and a sense of self-reliance; and
- Skills transfer and peer-to-peer learning to ensure locally-embedded network of strong CBEs: jobs fair, site visits, incentive funds for well-performing groups.

Component 4: Project Management, Monitoring and Evaluation (US$4 million)

48. This component will cover the cost for project management, implementation and supervision of project activities, administration of procurement and financial management, monitoring and evaluation, and safeguards compliance monitoring. The component will cover the cost of a unified PCU established under the MMMD, and three PIUs set up respectively under the MSD; KMC; and the ZEMA. A PMC would be supported under this component to support PCU and assist PIU in preparing, implementing and monitoring approved investments plans in Kabwe and Copperbelt provinces.

Table 2. 2. Project Financing

Project Component	Project Costs (US$)	IBRD or IDA	%Financing
A: Remediation of contaminated hotspots and improvement of environmental infrastructure	29,600,000	IDA	100%
B: Enhancing institutional capacity for environmental governance and compliance	13,500,000	IDA	100%
C: Reducing environmental health risks through localized interventions	18,500,000	IDA	100%
D: Project Management and M&E	4,000,000	IDA	100%
Total Project Costs	**65,600,000**		**100%**

D. Results Monitoring and Evaluation

49. The proposed project is a stand-alone project of five years with the PDO 'To reduce environmental health risks to the local population in critically polluted mining areas in Chingola, Kabwe, Kitwe and Mufulira municipalities, including lead exposure in Kabwe municipality'. M&E for the proposed project is guided by the project results framework (Annex 1) which is also the basis for the evaluation of the project at completion. The PCU will coordinate with the PIUs at MSD, KMC and ZEMA to organize data collection, analysis and dissemination.

50. Objectives for M&E are five-fold: i) a tool for results-based management and to ensure that data and information of the progress - or lack of progress - towards achievement of the outcomes under the PDO feed into management and that corrective measures can be taken in time if necessary; ii) a framework for accountability of progress for the resources invested; iii) a platform for communication of results of the project and benefits generated for target beneficiaries and stakeholders; iv) to meet the World Bank's routine reporting requirements, i.e. the six monthly progress report, Implementation Status and Results (ISR) report which is publicly disclosable, and data and information requirements for the mid-term review (MTR) of the project; and v) to generate much-needed quantitative and qualitative data on contamination baseline and trends and to build capacity of government institutions.

51. Capacity on M&E of participating institutions is weak - especially in respect of timely delivery of quality data on environmental health and environmental quality in contaminated areas. Currently, there is a dearth of good environmental health and environmental quality data in several contaminated areas, especially when it comes to demographic and socio-economic changes resulting from exposure to pollution. This undermines the ability of the government to make evidence-based policy decisions on establishing specific health impacts or assigning individual accountability. Under the project, support to strengthen the capacity in M&E is done to ensure results reporting for the sake of the project results framework but also as an end in itself: to strengthen capacity of Government and institutions in environment and health to collect, analyze, interpret and use data at the nexus of environment and health. For this reason, all sub-projects will invest in the generation of new baseline data on diurnal changes in environmental quality and health impacts. Project finances will be allocated to baseline surveys and population profiles of communities affected by lead and other chemical pollution. The project involves improving capacity of MMMD, MSD, RPA, ZEMA and participating Municipal Councils to monitor the results on the ground in terms of tracking environmental indicators such as quality of water, soil and human health.

52. The project results framework (Annex 1) will be reported in the ISRs. It consists of the PDO statement and four SMART (Specific, Measurable, Attributable, Relevant, Time-bound) PDO indicators and seven intermediate indicators. Core indicators of the World Bank are included too, i.e. core indicator on direct project beneficiaries and core sector indicator from pollution on contaminated land managed, rehabilitated or dump sites closed under the project. All indicators have baselines. For the indicator on share of population living within 500m from lead contamination hotspots in project area, it is assumed through expert consultation, that the baseline value is 100 percent of the population and will be confirmed by data collection in the first year. Targets are stated in the results framework as is the frequency for data collection, data sources and methodology for calculation of baseline and progress values of indicators and responsibilities for

data collection. Sources of data vary between indicators and types of data and their sources is captured in the table below:

Table 2. 3. Type of Data, Data Sources and Responsibilities

Type of data	Data sources	Responsible Institution	Remarks/comments
Health related: Blood Lead Levels (BLL)	Testing of blood samples by local doctors	MOH	BLL testing will be part of the case management system and will be captured in the Health management Information Systems
Pollution-related (ambient pollution): Soil quality Water quality Air quality (lead)	Testing of soil, water and air samples	ZEMA	
Jobs, livelihoods: People engaged in alternative livelihood activities	Project and activity records	PCU-MMMD	Data will be collected by PIU at the municipalities and communicated to the PCU
Compliance-related (pollution point source): Emission (soil, water, air)	Testing of soil, water and air samples	ZEMA	New data will be collected and disclosed through the ZEMA website
Long-term sustainability: Contribution of Environmental Protection Fund	Compliance with the 2015 Mines and Minerals Development Act	MSD	This will be based on Annual report produced by the MMMD

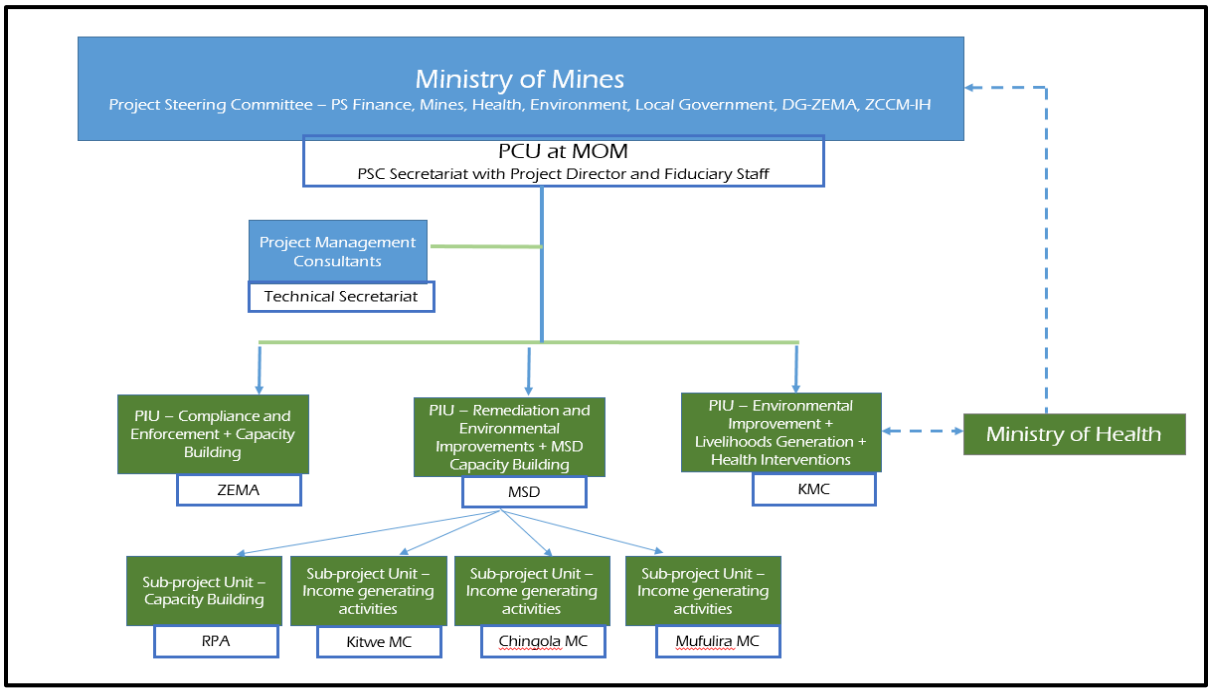
ANNEX 3: IMPLEMENTATION ARRANGEMENTS

ZAMBIA - MINING AND ENVIRONMENTAL REMEDIATION AND IMPROVEMENT PROJECT

Project Institutional and Implementation Arrangements

1. **The project will be implemented by the MMMD** in collaboration with the Ministries of Lands, Natural Resources and Environmental Protection (MLNREP), Ministry of Health (MOH) and Ministry of Local Government and Housing (MLGH). The MMMD has established a Project Steering Committee (PSC) chaired by the Permanent Secretary – Mines. The PSC constituted of the Permanent Secretaries of the Ministries of Environment, Health, Local Governance, Central Province and Finance, as well as Director General (DG) of ZEMA. A Project Coordination Unit (PCU) has been established at the MMMD with a designated Project Coordinator. For the purposes of implementation, three Project Implementation Units (PIUs) with a Designated Project Account, would be set up at MSD, MMMD and KMC, who would be responsible for planning, procurement, implementation and monitoring of various activities approved as part of annual plan. A Project Management Consultant will be providing implementation support to the PCU and PIUs. Specifically PIUs will be responsible for implementation of the annual plans, including (a) preparation of procurement plans and the management of the designated accounts; (b) accounting, financial management and reporting on the overall project; (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.

Figure 3.1: Project Management Structure



2. **Matrix of institutions responsibilities during implementation**. The following figure details the three layer structure for project management – Project Steering Committee (PSC); Project Coordination Unit (PCU); and Project Implementing Units (PIU), their responsibilities and accountabilities.

Figure 3.2: Responsibility matrix of institutions

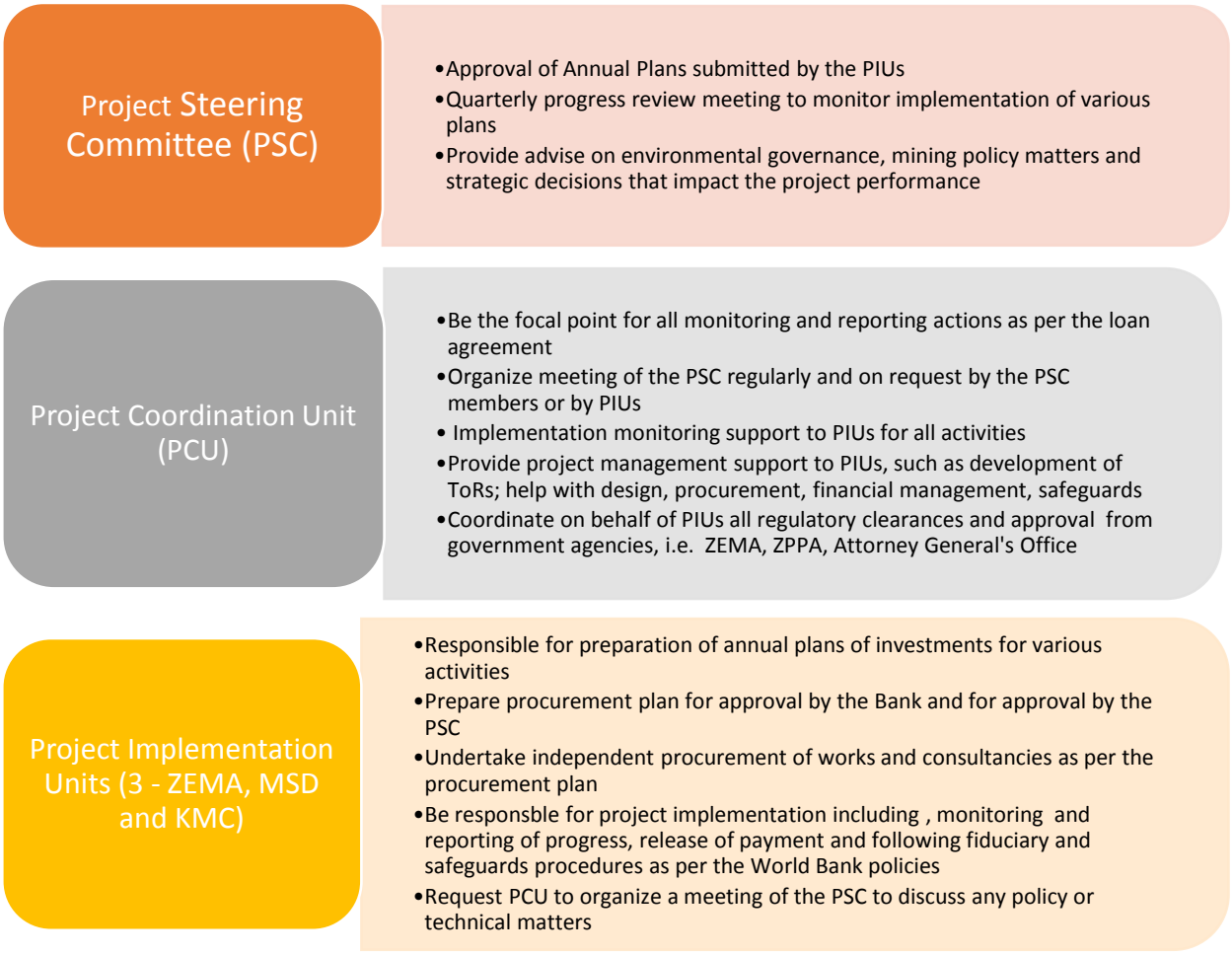


Figure 3.3: Organogram for Decision Meeting

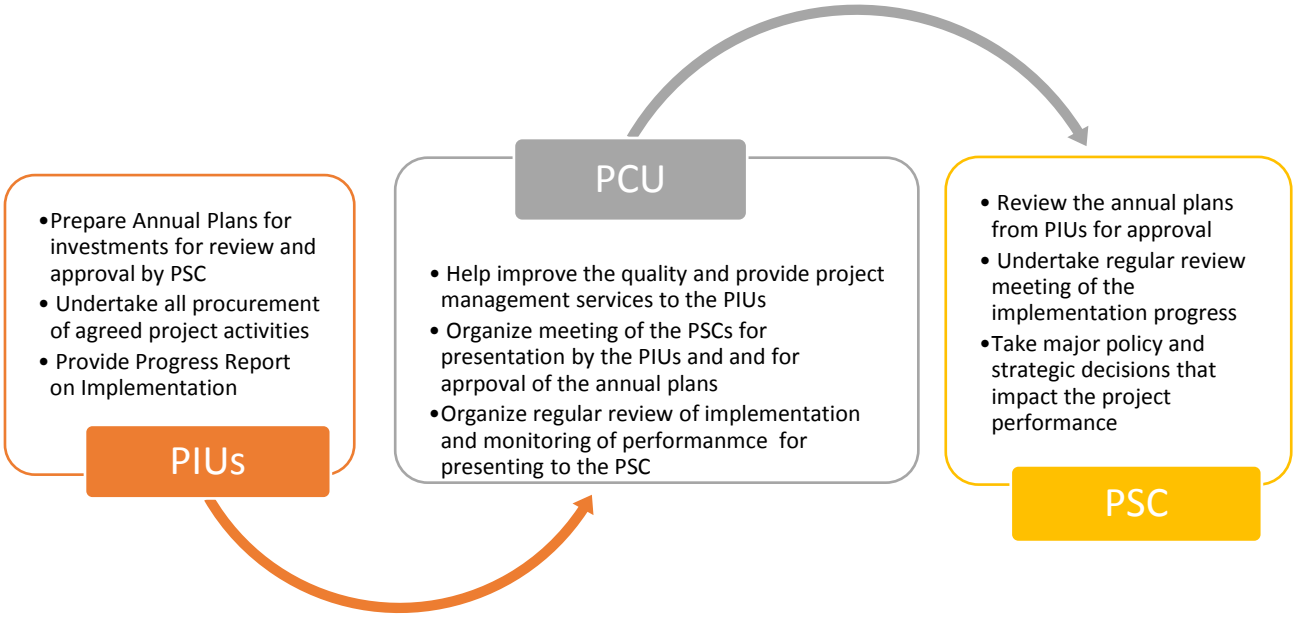


Table 3.1: Staffing Plan for Project Coordination Unit (PCU) in Lusaka

	POSITION	**Dedicated exclusively to the project**	**Supporting also other activities in the MMMD**
1	Project Team Leader	X	
2	M&E Specialist		X
3	Environmental and Social Safeguards Specialist	X	
4	Project Accountant	X	
5	Procurement Officer	X	
6	Communications Officer	X	

3. **Institutional arrangements for PIU at MSD (PIU-1), Figure 3.5:**

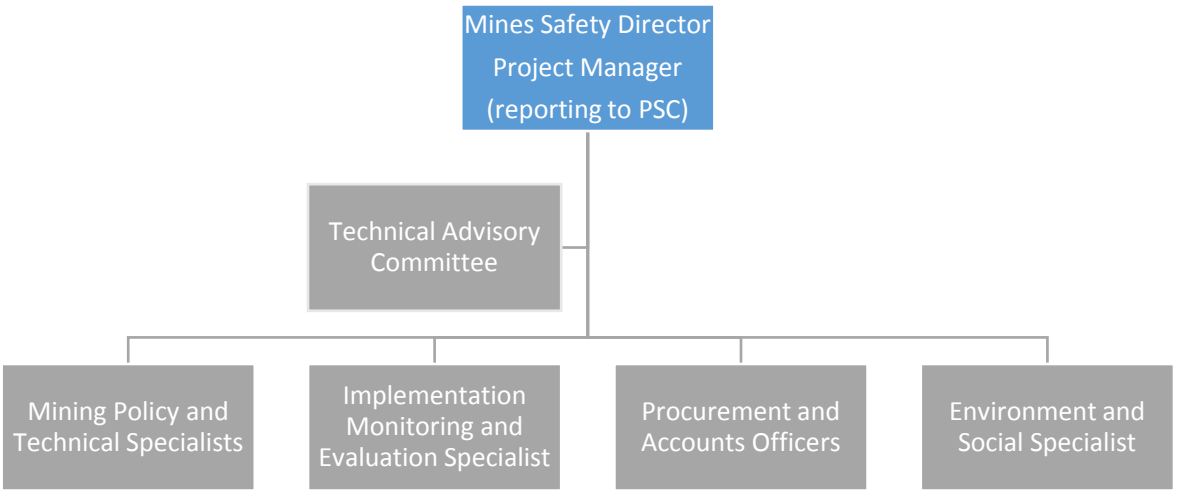


Table 3.2 Staffing Plan for PIU-1 at MSD in Kitwe

	POSITION	**Dedicated exclusively to project**	**Part Time**
1	Project Manager	X	
2	Mining Engineer	X	
3	Mining Policy Specialist		X
4	Implementation Monitoring & Evaluation Officer		X
5	Environment and Social Safeguards Specialist	X	
6	Accounts Officer	X	
7	Procurement Officer	X	

4. **Institutional arrangement for PIU at KMC (PIU-2)**. The Project Implementation Unit at KMC will be chaired by a Project Director, and project implementation will be coordinated by a Project Coordinator, supported by a team of specialists responsible for subcomponents on a) environmental infrastructure; b) health interventions; c) livelihood interventions; and d) education and information interventions. The following chart describes their responsibilities and accountabilities.

Figure 3.6: Organogram for PIU-2 at KMC

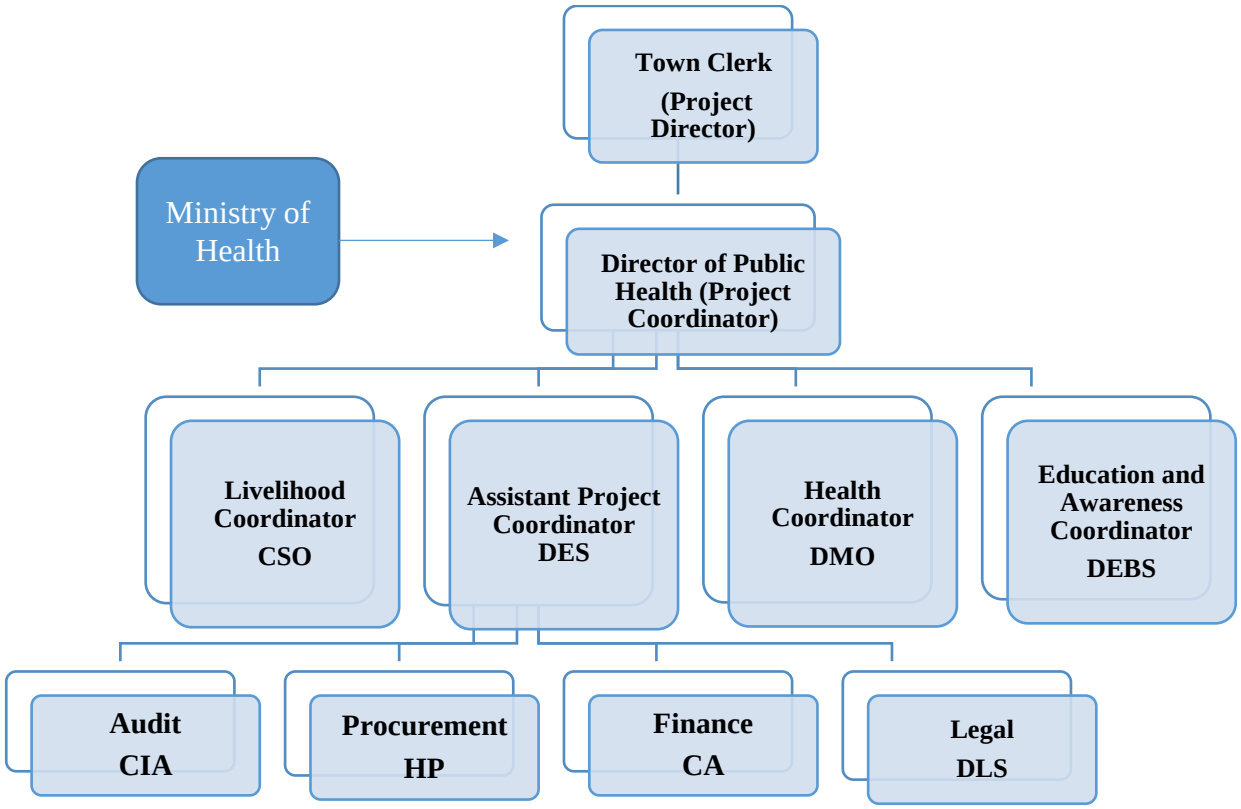


Table 3.3: Staffing Plan for PIU-2 at KMC

	POSITION	Dedicated exclusively to project	Part Time
1	Project Coordinator	X	
2	Health Coordinator/DMO	X	
3	Livelihood Coordinator	X	
4	Environment and Social Safeguards Specialist	X	
5	Accounts Officer	X	
6	Procurement Officer	X	
7	Education and Awareness coordinator	X	

5. **Institution arrangement for PIU at ZEMA (PIU-3)**. The Project Implementation Unit at KMC would be chaired by a Project Director, with a Project Manager and Project Coordinator. They will be supported by a team of specialists responsible for activities under subcomponent 2.2. The following chart described their responsibilities and accountabilities.

Figure 3.7: Organogram for PIU-3 at ZEMA

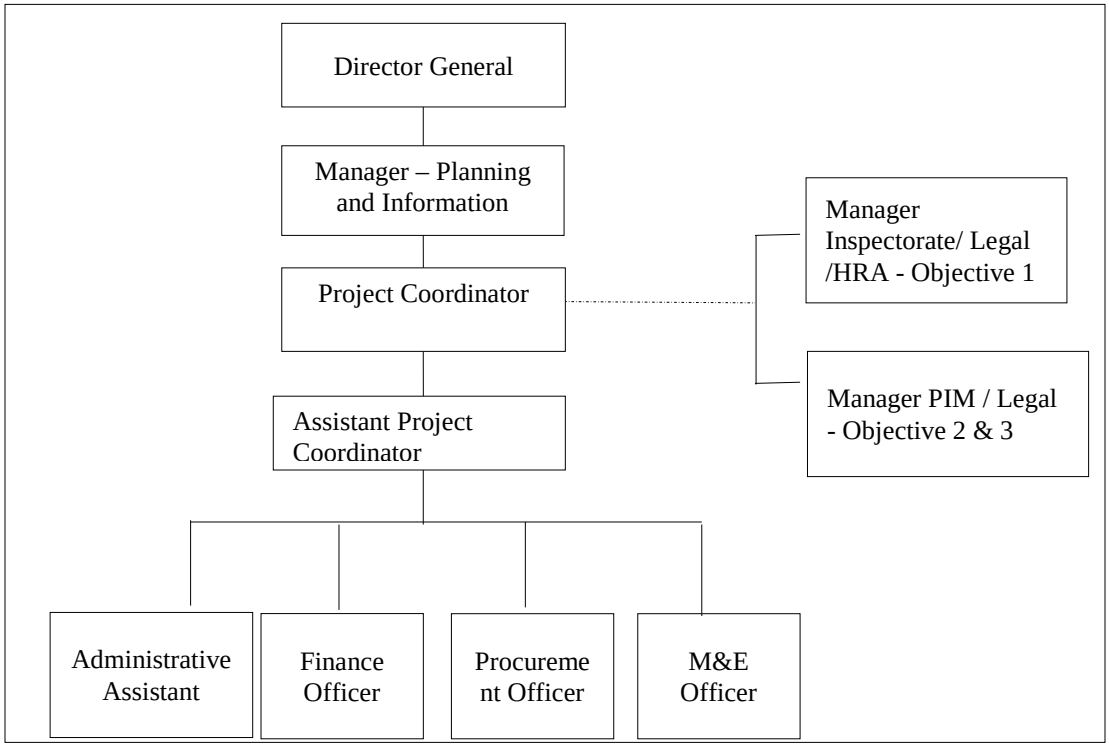


Table 3.4: Staffing Plan for PIU-3 at ZEMA in Kabwe and Lusaka

	POSITION	**Dedicated exclusively to project**	**Part Time**
	Director General		
1	Manager – Planning and Information (Team Leader)		X
2	Project Coordinator/regulation expert	X	
3	Assistant Project Coordinator/Inspection/Legal/Enforcement Officer		X
4	Monitoring and Evaluation Specialist		X
5	Finance Officer	X	
6	Procurement Officer	X	

6. Implementation Process Component 3.1: Local Health Intervention: The following process will be followed for Lead testing medical equipment.

1. Procurement Strategy to be developed by KMC/DMO – will integrate Procurement officials from MOH
2. Technical specifications of test kits and lead care analyzers will be sent by World Bank to DMO
3. Tech specs will be reviewed by KMC/DMO, and sent to Medical Equipment Officer of the Provincial Medical Office (PMO) for clearance
4. Medical Equipment Officer (PMO) will discuss and get clearance from MOH before sending approval for procurement to KMC/DMO
5. Bid package will be prepared by KMC/DMO
6. Procurement contract will be issued by KMC

7. The following process will be followed for medicines:

1. Procurement Strategy to be developed by KMC/DMO – will integrate Procurement officials from MOH
2. Tech specs will be reviewed by DMO, and sent to PMO for review
3. Need based documentation will be written up by DMO/PMO and submitted to MOH
4. MOH will submit these to Zambia Medicines Regulatory Authority (ZAMRA) and Pharma Society of Zambia for registration
5. After registration notification is received, MOH will inform DMO for procurement (pharmaceuticals can be procured by local purchasing officer at district level)

8. The following process will be followed for Ethical Clearance:

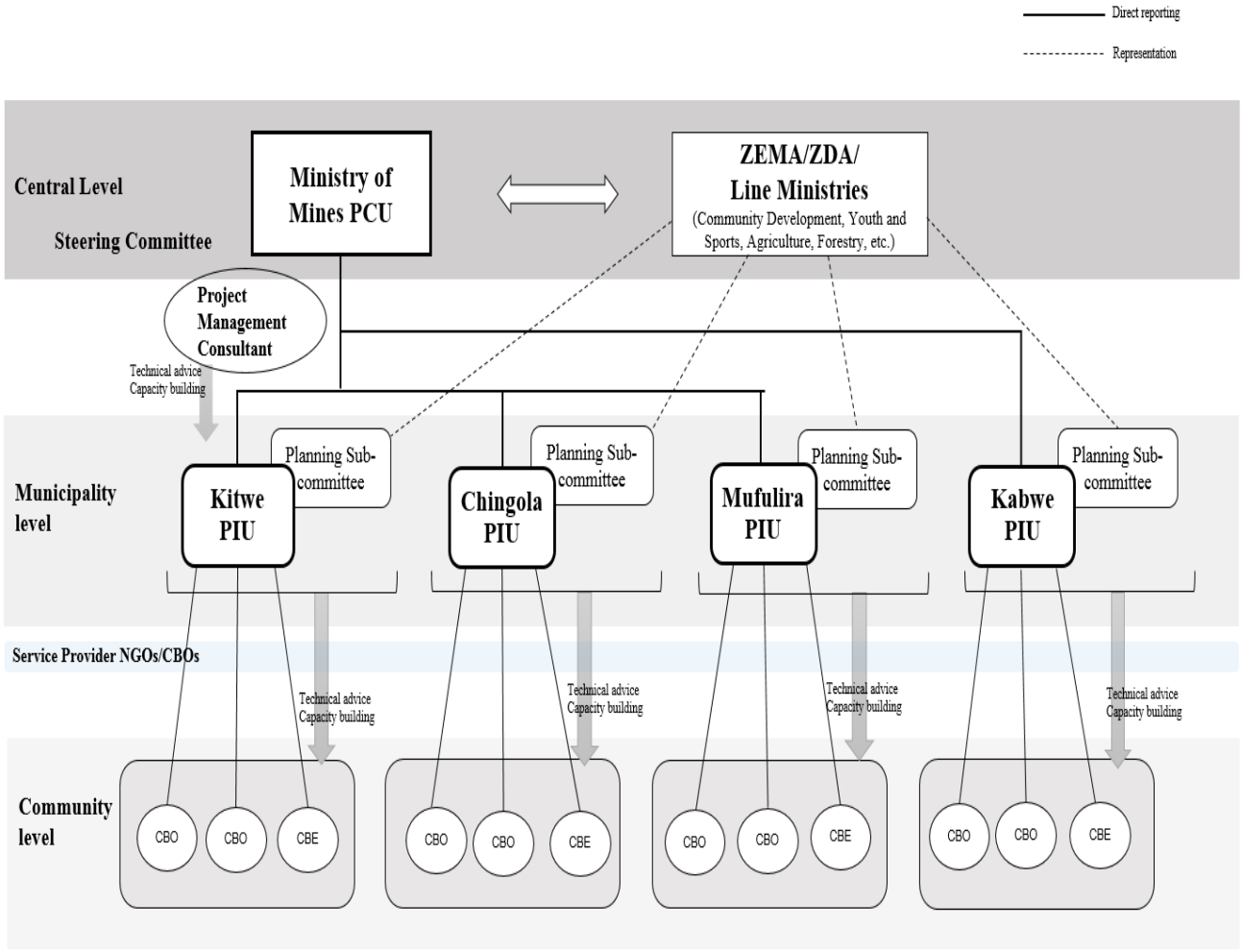
1. DMO to identify Principal Investigator and a focal point in MOH;
2. Protocol needs to be prepared by DMO with support from World Bank
3. DMO/KMC will prepare ethical clearance forms for submission to Ethical Clearance Committee under University of Zambia, School of Medicine
4. Document will then be submitted to Research Council in MOH

9. The following process will be followed for Data Base and Information Management

1. Procurement Strategy to be developed by KMC/DMO
2. Technical specifications will be developed by DMO
3. Tech specs will be reviewed by KMC/DMO
4. Bid package will be prepared by KMC/DMO
5. Procurement contract will be issued by KMC

10. Institutional arrangements and flow of funds for Component 3.2

Figure 3.8: Institutional Arrangements for Sub-Grants

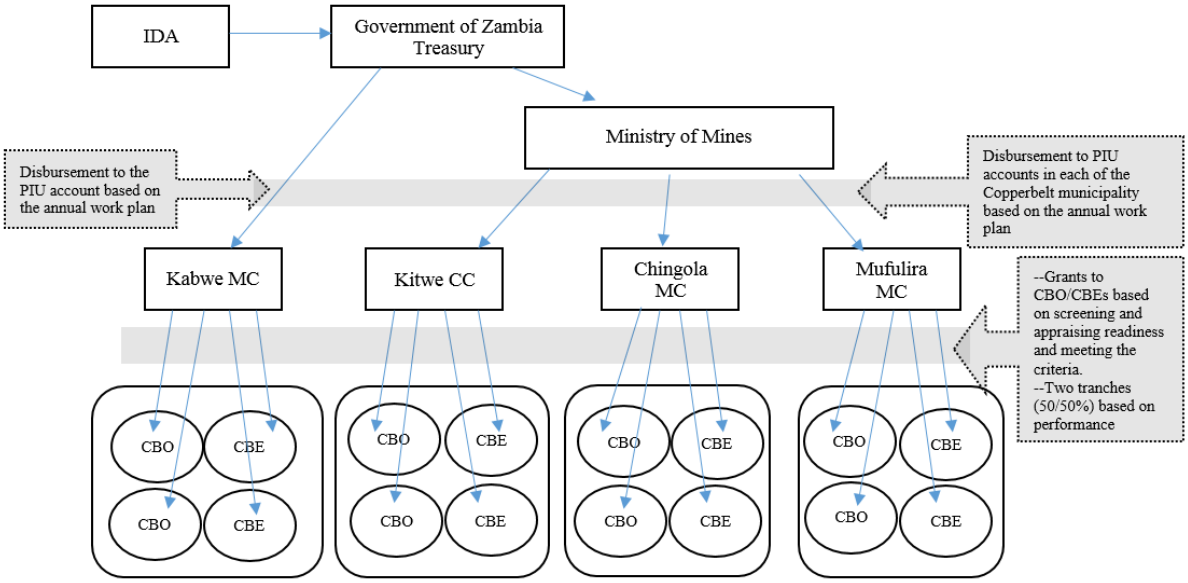


11. **Criteria for appraisal and selection of sub-project proposals submitted by communities**. Proposals submitted by community groups will be first desk-reviewed by the PIU, followed by a field appraisal including visiting the target area and meeting with group members. The purpose of the appraisal is to assess and verify whether the proposals meet the eligibility and selection criteria, and if the activity is socially, environmentally, and financially viable and sustainable. The summary of proposals will be reviewed by the Planning Sub-Committee of the Municipal Council to ensure technical quality and coordination with other relevant initiatives in the locality. The Planning Sub-Committee is chaired by the Director Planning and comprises technical officers from various line ministries (water, agriculture, education, youth and sports, community development, etc.). As needed, the project staff as well as officers from relevant line ministries/agencies will provide technical inputs, information on relevant partners, and any suggestions to strengthen the proposals.

12. **Monitoring of the sub-projects**. CBEs will fill out a quarterly monitoring form and submit it to the municipal PIU. The responsible officers in the PIU will also visit the sub-project sites and

meet with the beneficiaries periodically to monitor and report implementation progress, challenges, and outcomes. The Planning Sub-Committee at the municipality will also conduct periodic monitoring visits and meeting with participating CBEs, and provide technical advice and capacity building. Observations from regular monitoring activities will be consolidated in the municipal-level quarterly monitoring report, which will be submitted to the national level PCU of the MMMD. The monitoring report will include: progress data that need to be captured for the project's results framework/indicators, and financial and safeguards related matters.

Figure 3.9: Flow of Funds for Sub-Grants



13. *Grievance Redress Mechanism:* The project will set up a grievance redress mechanism (GRM) to ensure community members or any stakeholders are able to raise their concerns regarding project-related activities, including the application of relevant social and environmental safeguards and mitigation measures. The GRM will build on both traditional conflict-resolution systems as well as project specific entry points. Received grievances will be systematically recorded and addressed by focal persons at each level, and consolidated by the PCU at the MMMD into a grievance database. The project's GRM will be explained so that all stakeholders are aware and encouraged to report grievances. More detailed plans on the GRM is explained in the PIM.

14. *Sub-Projects Monitoring Arrangements:* Monitoring arrangements will be put in place at different levels: (a) Community level: community/ward level, sub-committees will routinely conduct participatory monitoring, and will submit a simple monitoring form to the District Planning Sub-Committee (DPSC); (b) Municipal Council-level: Planning Sub-Committees, consisting of technical officers, will review the community monitoring forms and conduct periodic site visits to verify subprojects progress, fiduciary and safeguards compliance; (c) Project level: the Project Implementing Units (in MSD, ZEMA and Kabwe Council) will review and consolidate the sub-project -level reports, and will be responsible for tracking key results indicators in each sub-project areas; and (d) at Lusaka level, the PCU monitoring and evaluation department and the Project Coordinator will be the focal persons for monitoring project implementation (including

through quarterly site visits), and for reporting progress and results to other national-level stakeholders and the World Bank.

15. **Third Party Monitoring.** The Project will apply third-party monitoring tools to ensure the project's various investments are technically, financially, socially, and environmentally compliant. This will in particular be done through ongoing independent: (a) financial audits (independent audits); (b) technical audits (independent international firm or consultant); and (c) by engaging NGO and community monitoring of technical, social, and environmental compliance.

Financial Management

16. A financial management assessment of the PIUs at ZEMA, MSD and Kabwe council was undertaken to evaluate the adequacy of the project arrangements in accordance with the Bank's minimum requirements as per OP/BP 10.00. The assessment complied with the Financial Management Manual for World Bank-Financed Investment Operations that became effective on March 1, 2010, as well as with Africa Financial Management Assessment and Risk Rating Principles. The financial management assessment identified the following capacity constraints in the PIUs: (a) inadequate supervision by government's controlling officers; (b) issues of unsupported vouchers; and (c) weak internal audit committee to follow up the recommendations of both internal and external audit reports. Since the Financial Management assessment was completed, the PIUs implemented the following mitigation measures: (a) completed the development of the budget tracking tool; (b) developed and adopted a plan to embed the financial management of the PIUs into the project module of the Integrated Financial Management Information System (IFMIS); and (c) initiated engagement d the office of the controller of internal audits to undertake internal audits of the PIUs. The overall conclusion of the assessment is that despite the control environment issues affecting the country, as assessed by various diagnostic studies in Zambia, the implementing agencies (MMMD, ZEMA and KMC) satisfies the minimum financial management requirements as stated in the Bank's OP/BP 10.00. The risk rating for the project's financial management arrangements has therefore been assessed as *Moderate*.

17. Project Financial Management Arrangements

(a) **Staffing.** The three PIUs have a Finance Department headed by a Financial Management Specialist (FMS) who is assisted by project accountants. However, this staffing arrangement is not adequate; therefore, it is recommended that the Project employs its own dedicated project accountant at the PCU to be assisted by an accountant.

(b) **Budget preparation and monitoring** will follow national procedures, full details of which will be documented in the Project Implementation Manual (PIM). KMC and ZEMA will submit their Annual Work Plans and Budgets to PCU of MMMD for consolidation. The project will need to develop a project Financial Management Procedures Manual as part of the PIM that will document the accounting policies and procedures to be used. The project will use cash basis accounting in line with International Public Sector Accounting Standards (IPSAS). All the implementing agencies have functional internal audit units which are adequately staffed. They also have audit committees that meet on a regular basis; therefore, the project will rely on both the internal audit units and the audit committees of the implementing agencies for internal audit functions. The project will submit quarterly

interim financial reports (IFRs), format agreed with the World Bank, within 45 days of the end of each calendar quarter. The PCU will prepare annual accounts within three months after the end of the financial year in accordance with accounting standards acceptable to the World Bank. The PCU will be responsible for ensuring that the reports are audited and submitted to the World Bank within six months after the end of the financial year. The project's financial statements will be audited by the Office of the Auditor General, the supreme audit institution in Zambia, which may contract acceptable private audit firms to conduct the audits on their behalf. Audit reports together with management letters should be submitted to the World Bank within six months after the close of the year. Audit reports will be publically disclosed by the World Bank in accordance with the World Bank's disclosure policy.

(c) Internal Controls and Internal audit. The existing Financial Management Regulations, 2006, Operationalizing the Public Finance Act, 2004 (Act No. 15 of 2004) will be applicable to the Project operations. The regulations identify and define responsibilities for the various officers involved in the accounting processes. The regulations include among others, i) control procedures governing expenditures and payments; ii) imprest; iii) accountable documents; safes; and iv) loss of public funds and assets, and the audit of accounts by the Auditor General. These regulations and procedures are considered adequate. The Project will also use the MMMD's internal audit function.

18. Accounting Arrangements

(a) Accounting System. The project will use MMMD's accounting system, Pastel ERP, which is adequate. However, the project is in the process of migrating to the IFMIS project module.

(b) Accounting basis. The project will use cash basis accounting, in line with International Public Sector Accounting Standards (IPSAS).

19. Financial Reporting: The PCU will be responsible to produce and share with the World Bank the following:

(a) Unaudited Interim Financial Reports (IFRs): unaudited interim financial reports will be provided on a quarterly basis to manage and monitor the use of the funds. The financial reports should at the minimum show a statement of sources and uses of funds, with the uses of funds analyzed by component and by activities. The quarterly reports should be submitted to the IDA 45 days after the end of the quarter.

(b) Annual Financial Statements (audited): An external audit will be carried out annually by the Office of the Auditor General (OAG) who, as outlined in the Constitution of Zambia Act 1996, is responsible for the audit of all government funds, though in practice, because of capacity constraints, the OAG frequently appoints private sector auditors acceptable to the Bank to carry out the audit on behalf of the AG. The auditor will conduct the audit according to International Standards on Auditing (ISA and Terms of Reference (TORs) acceptable to the Bank. The auditor will express an opinion on the financial statements accounting to the Bank's audit policy. IDA requires that audited financial statements for the project be submitted no later than six months after the end of the year.

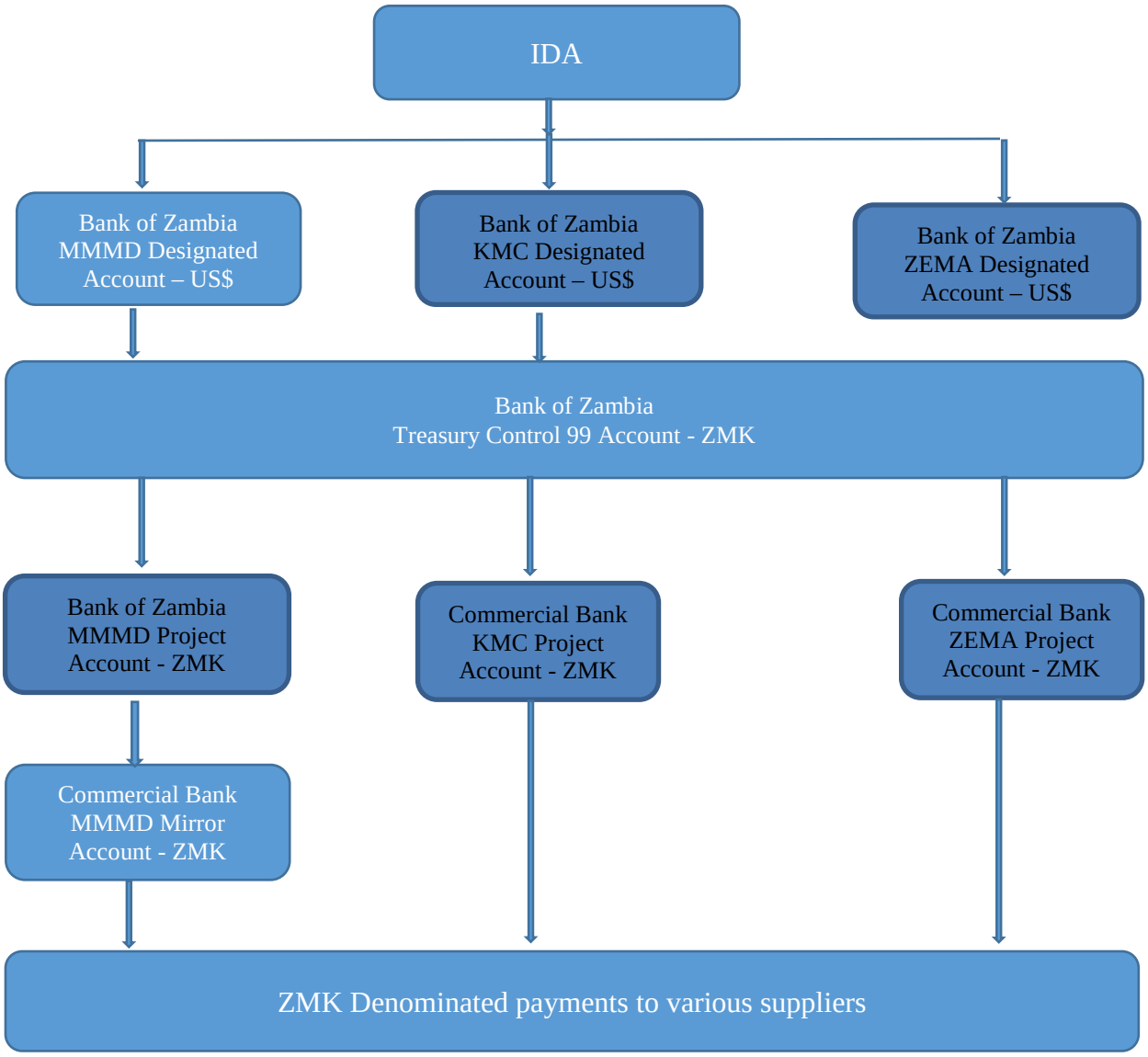
(c) Besides the audit opinion, the auditor will be required to prepare a separate report to Management, giving significant weaknesses that the auditor came across during the course of the audit that are not reflected in the audit opinion. These may include weaknesses in the internal control systems, inappropriate accounting policies and practices, issues regarding general compliance with broad covenants and any other matters the auditor considers should be brought to the attention of the client, and providing recommendations for improvements. Like the audit report, the Management Letter should be submitted to IDA within six months after the year end.

(d) The audit arrangements should be based on the "Guidelines – Annual Financial Reporting and Auditing of World Bank-Financed Activities" issued by the World Bank on June 30, 2003.

20. Funds Flow and Disbursement Arrangements

(a) **Flow of funds arrangements.** The project will use a system under which funds will flow from the World Bank to Designated Accounts (DAs) denominated in United States Dollars, as reflected in the Disbursement Letter. The Project Designated Accounts at MMMD, ZEMA and KMC have been opened. The three designated accounts will receive funds from the Bank to implement all investment and capacity building activities, as per Annual Work Plan to be approved by the PSC. Additional Sub-Accounts will be created under MMMD for specific activities which are to be implemented by Municipal Councils of Kitwe, Mufilira and Chingola and Radiation Protection Authority. Funds will flow from the Project Designated Account at MMMD to these four Sub-Accounts to fund planning and design studies, specific priority interventions -- sub-projects -- and associated operating costs. Funding for all procurement for Health interventions (services, goods, training) will be managed by KMC. In case of four sub-accounts, during project implementation, the Ministry of Finance on behalf of the Project will transfer funds from the Designated Account to a project operational account, through Control 99 (a treasury account) and managed by the three PIUs. A funding slip is then issued to the project showing that the Kwacha equivalent has been transferred. From the project's operational account, all payments will be made through a mirror account (zero balance) held at a commercial bank. The mirror account will be used to make payments for goods, services and incremental operating costs pre-agreed with the project in an annual work plan.

Figure 3.10: Flow of Funds



(b) **Disbursement arrangements.** The project will use the transaction-based method of disbursements (Statements of Expenditure – SOEs). Other methods of disbursing to the project will include reimbursements, direct payment, and use of special commitments (for example, letters of credit). Further disbursement details will be provided in the disbursement letter.

(c) The project may use any of the following methods to disburse the credit proceeds: (i) advance method; (ii) direct payment to a third party; (iii) special commitment to pay amounts to a third party in respect of expenditure to be financed out of the credit proceeds, upon the request and under terms and conditions in finance agreement; and (iv) reimbursement procedure where the World Bank would reimburse the expenditures

eligible for financing that the implementing agency has pre-financed from its own resources.

(d) Transaction disbursement documentation will be followed during the project implementation. Under the transaction-based procedure, the required supporting documentation will be summary reports, records and the SOEs. All SOEs supporting documentation will be kept by the implementing agency. They shall be available for review by Bank supervision missions and internal and external auditors. The agencies shall be encouraged to register the project in the Bank Client Connection to facilitate processing of withdrawal requests.

21. *Retroactive Financing:* Project activities costing a total amount of up to US$500,000 are eligible for retroactive financing. Retroactive financing will cover Consultant's Services, Goods, and Works, under category 2 of disbursement. Retroactive Financing will apply to payments made by the Borrower from July 1, 2016.

22. **Supervision plan.** Financial management supervision will be carried by IDA as part of the overall supervision for the project. At least two missions are expected a year. The objective of the financial management supervision is to ensure that the continued adequacy of the project's compliance with relevant legal covenants of the Financing Agreement, and that the proceeds of the credit are used only for the purposes for which the credit was intended, with due regard to economy and efficiency and also to build the financial management capacity of the implementing agency. The actual work will include the checking of the unaudited IFRs and the Audit Reports/Management Letters from the external auditors and following up with the project secretariat on all significant accountability related issues.

Procurement

23. A Procurement Risk Assessment (P-RAMS) was undertaken in accordance with the World Bank's Procurement Risk Management System. The Implementation Agency Procurement Risk was assessed as *Moderate*. Implementation of the risk mitigations actions would reduce it to *Low*.

24. **Procurement Manual and Procurement Plan.** The procurement arrangements to be used under the Project, including packaging of procurement, maintaining clarity of accountability over procurement, record keeping, and frequency and scope of prior and post review will be elaborated in the procurement module of the PIM ("the procurement manual") and in the procurement plans. This procurement sections of the PIM has been amended to include a section on the specific requirements for the Zambia*:* Mining and Environment Remediation and Improvement Project. The Procurement Manual addresses the needs of the various implementation agencies, including the needs and procedures for procurement at community level. The Manual outlines the identified risks and provide risk mitigation actions. It covers the legal and regulatory framework, roles and responsibilities of the institutions and staff involved in procurement, internal and external controls and quality assurance checks or systems, approval systems and accountability, and contracts register. It also spells out the roles and responsibilities of various players in contract management, based on both government regulations and as required for prior review of IDA contracts.

25. **Procurement decentralization.** Procurement decentralization affects since January 1, 2013, all procuring entities. This means that the Zambia Public Procurement Agency (ZPPA) has not been involved in reviewing bidding documents and bid evaluation and review and approval or not of contract award recommendations. All procurement activities will be carried out internally by the MMMD using its own institutional arrangements, controls and quality checks. Since January 2013, the ZPPA has been transformed into a regulatory and oversight body for public procurement in Zambia.

26. **Procurement risk mitigation measures.** Based on the P-RAMS, the main risks and proposed risk mitigation measures are shown in table below.

Table 3.5: Summary of Procurement Assessment of Capacity, Risk, and Mitigation - Action Plan for MMMD

Risks	Mitigation Measures	Action by	By When
Procurement manual: MMMD's Procurement manual will require to be regularly updated in include provisions for the project	Ensure the procurement decision making is fully covered in the Manual of the Agency and is widely disseminated.	MMMD	December 31, 2016
Evaluations and awards of contracts: Reports do not always contain all essential information necessary for approvals, including adequate justification for decisions taken during evaluation such as rejection of bids Wrong award decision may be made because of inadequate information, and due diligence is not routinely carried out	Quality of evaluations and awards of contracts requires enhancing. Staff to be trained in good evaluation practices which base decisions on pre-disclosed criteria and includes due diligence verifications of bidders recommended for award of contract.	MMMD	Starting from project effectiveness
Inadequate participation by technical experts in bid preparation and evaluation leading to potential / inadequate bidding process and contract awards	Improve procurement implementation capacity by acquiring the necessary procurement expertise. Involve technical staff and users in preparation of specifications or agree to hire competent consultants to draft technical specifications and terms of reference and during evaluation of bids and proposals.	MMMD	Starting from project effectiveness
Procurement staff capacity may be inadequate due to increased work load that will result from the implementation of the project	Improve procurement implementation capacity by acquiring the necessary procurement expertise (recruit procurement officer in the Lusaka).	MMMD	By project effectiveness

27. **Procurement Post Reviews (PPRs) and Independent Post Reviews (IPRs) by the World Bank.** Based on the assessed agency implementation risk for procurement, which is *Moderate*, the World Bank will carry out PPRs or IPRs for all contracts that will based on the procurement plan not having been subject of prior review by the World Bank using a sample of 10 percent. Based on continuing assessment of risk and the success of risk mitigation measures implemented, the sample size will be reduced as risk mitigation measures are successfully implemented.[66] The review thresholds are shown in table below.

Table 3.6: Prior Review and Procurement Method Thresholds[67]

Expenditure Category	Procurement Method	Contract Value Threshold for Use of Method (US$)	Contracts Subject to Prior Review (US$)
Works	ICB(Works/Supply and Installation)	>= 10,000,000	All contracts
	NCB	>= 200,000 - < 10,000,000	As in procurement plan
	Force Account	All values	All contracts
	Shopping	< 200,000	None
	Community Participation in Procurement (Community driven Development)	All values	None
	Direct Contracting	All values	All contracts
Goods	ICB	>= 2,000,000	All contracts
	NCB	>= 100,000 < 2,000,000	As in procurement plan
	Shopping	< 300,000 (motor vehicles only)	None
	Shopping	< 100,000 (rest not motor vehicles)	None
	Community Participation in Procurement (CDD)	All values	None
	Direct Contracting	All values	All contracts
	Procurement from UN agencies	All values	None

28. **Procurement Plan.** The MMMD, ZEMA and KMC, with the support of the World Bank, have developed a procurement plan for the first 18 months of Project implementation. The World Bank reviewed and approved this plan on July 1, 2016. The procurement plan includes all the procurement packages identified for the first 18 months of project implementation. The procurement plan will be updated as required at least once a year throughout the life of the project.

[66] High Risk projects focus on a sample size of 20 percent; Substantial risk, a sample size of 15 percent, Moderate risk 10 percent, and Low risk 5 percent. Changes in risk levels will be communicated to the MoF as outcomes of the PPR / IPR exercise, which also result in the revisions of the prior review and National Competitive Bidding thresholds.

[67] Contracts with a cost estimate below US$300,000 for motor vehicles only may be procured on basis of shopping procurement method.

29. **Procurement methods**. Particular methods of procurement of goods and works are as follows:

a) International Competitive Bidding (ICB). Except as otherwise provided, goods and works shall be procured under contracts awarded on the basis of ICB

b) Other methods of procurement of goods and works. The following list specifies the methods of procurement, other than International Competitive Bidding which may be used for goods and works. The Procurement Plan shall specify the circumstances under which such methods may be used:

(i) National Competitive Bidding
(ii) Force Account
(iii) Procurement from UN agencies
(iv) Shopping
(v) Direct Contracting
(vi) Community Participation in Procurement (CDD).

30. Additional Provisions for National Competitive Bidding: The following provisions shall apply to the procurement of goods and works under National Competitive Bidding procedures: The procurement procedure to be followed for National Competitive Bidding ("NCB") shall be the open bidding procedure set forth in the Public Procurement Act, 2008, Act. No.12 of 2008, as amended by the Public Procurement (Amendment) Act, 2011, Act No. 15 of 2011 (the "PPA"), and the Public Procurement Regulations, 2011, Statutory Instrument No. 63 of 2011 (the "Regulations"); provided, however, that such procedure shall be subject to the provisions of Section I and Paragraphs 3.3 and 3.4 of Section III, and Appendix 1 of the "Guidelines for Procurement of Goods, Works, and Non-Consulting Services under IBRD Loans and IDA Credits & Grants by World Bank Borrowers" (January 2011, and revised July 2014) (the "Procurement Guidelines"), and the additional provisions in the following paragraphs:

(a) Eligibility: Eligibility to participate in a procurement process and to be awarded an Association-financed contract shall be as defined under Section I of the Procurement Guidelines; accordingly, no bidder or potential bidder shall be declared ineligible for contracts financed by the Association for reasons other than those provided in Section I of the Procurement Guidelines. No restriction based on nationality of bidders and/or origin of goods shall apply, and foreign bidders shall be allowed to participate in NCB without application of restrictive conditions, such as, but not limited to, mandatory partnering or subcontracting with national entities.

(b) Domestic Preference: No margins of preference of any sort shall be applied in the bid evaluation.

(c) Bidding Documents: Procuring entities shall use bidding documents acceptable to the Association.

(d) Bid validity: An extension of bid validity, if justified by exceptional circumstances, may be requested in accordance with Appendix 1 of the Procurement Guidelines. A corresponding extension of any bid guarantee shall be required in all cases of

extension of bid validity. A bidder may refuse a request for extension of bid validity without forfeiting its bid guarantee.

(e) Qualification: Qualification criteria shall be clearly specified in the bidding documents. All criteria so specified, and only such specified criteria, shall be used to determine whether a bidder is qualified. Qualification shall be assessed on a "pass or fail" basis, and merit points shall not be used. Such assessment shall be based entirely upon the bidder's or prospective bidder's capability and resources to effectively perform the contract, taking into account objective and measurable factors, including: (i) relevant general and specific experience, and satisfactory past performance and successful completion of similar contracts over a given period; (ii) financial position; and where relevant (ii) capability of construction and/or manufacturing facilities.

(f) Prequalification procedures and documents acceptable to the Association shall be used for large, complex and/or specialized works. Verification of the information upon which a bidder was prequalified, including current commitments, shall be carried out at the time of contract award, along with the bidder's capability with respect to personnel and equipment. Where pre-qualification is not used, the qualification of the bidder who is recommended for award of contract shall be assessed by post-qualification, applying the qualification criteria stated in the bidding documents.

(g) Bid Evaluation: All bid evaluation criteria other than price shall be quantifiable in monetary terms. Merit points shall not be used, and no minimum point or percentage value shall be assigned to the evaluation criteria or significance of price in bid evaluation. No negotiations shall be permitted.

(h) Guarantees: Guarantees shall be in the format, shall have the period of validity and shall be submitted when and as specified in the bidding documents.

(i) Cost Estimates: Detailed cost estimates shall be confidential and shall not be disclosed to prospective bidders. No bids shall be rejected on the basis of comparison with the cost estimates without the Association's prior written concurrence.

(j) Rejection of bids and re-bidding: No bid shall be rejected solely because it falls outside of a predetermined price range or exceeds the estimated cost. All bids (or the sole bid if only one bid is received) shall not be rejected, the procurement process shall not be cancelled, and new bids shall not be solicited without the Association's prior written concurrence.

(k) Fraud and corruption: In accordance with the Procurement Guidelines, each bidding document and contract shall include provisions stating the Association's policy to sanction firms or individuals found to have engaged in fraud and corruption as set forth in the Procurement Guidelines.

(l) Inspection and audit rights: In accordance with the Procurement Guidelines, each bidding document and contract shall include provisions stating the World Bank's

policy with respect to inspection and audit of accounts, records and other documents relating to the submission of bids and contract performance.

31. Particular methods of procurement for consulting services are:

(a) Quality and Cost-Based Selection (QCBS). Except as otherwise provided in the paragraph below, consultants services shall be procured under contracts awarded on the basis of Quality and Cost-Based Selection.

(b) Other methods of procurement of consultants' services. The following list specifies selection methods, other than Quality and Cost-Based Selection, which may be used for consultants' services. The Procurement Plan shall specify the circumstances under which such methods may be used:
   (i) Quality-Based Selection (QBS)
   (ii) Selection based on the Consultant's Qualifications (CQS)
   (iii) Least-Cost Selection (LCS)
   (iv) Single-Source Selection for firms (SSS)
   (v) Individual Consultants (IC)
   (vi) Single-Source Selection for IC (SSS).

Table 3.7: Prior Review Threshold: Consultants

	Selection Method	**Prior Review Threshold**	**Comments**
1.	QCBS and QBS	>, =$200,000	All except for engineering and contract management only whose threshold will be > =$300,000
2.	FBS, QBS, LCS and CQS	<$200,000	As per procurement plan
3.	Single Source (Firms)	N/A	All
4.	Individual Consultants	> =$100,000	All
5.	Individual Consultants	<$100,000	As per procurement plan
6.	Single Source (Individual Consultants)	N/A	All
Notes: QCBS = Quality- and Cost-Based Selection (Section II of the Consultants' Guidelines) LCS = Least Cost Selection (Para 3.6, of the Guidelines) CQS = Selection based on Consultants' Qualifications (Para 3.7 of the Guidelines) FBS= Fixed Budget Selection (Para 3.5 of the Guidelines) QBS = Quality Based Selection (Para 3.2 of the Guidelines)			

i. **Selection of Consulting Services**: Selection of consulting services under the project will be carried out based on the provisions of the "Guidelines Selection and Employment of Consultants under IBRD Loans and IDA Credits & Grants by World Bank Borrowers dated January 2011 revised July 2014". The consulting services that are likely to be needed under the project include those for design, supervision, dispute resolution, the environmental assessments and safeguard study, and the financial, procurement, and technical audits. These contracting needs will be identified and included in the procurement plan, and contractors will be selected on the basis of

methods that have been included in the approved procurement plan. These methods and their corresponding prior review limits are provided above.

ii. **Short List Comprising Entirely National Consultants**. Shortlists of consultants for services that are estimated to cost less than US$200,000 equivalent per contract may be comprised entirely of national consultants in accordance with the provisions of paragraph 2.7 of the World Bank's Consultant Guidelines. Engineering and Contract Management contracts with cost estimates of less than US$300,000 may be comprised entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines. The procurement plan will indicate which contracts using CQS may not have shortlists comprising entirely of national firms.

iii. **Review of Terms of reference (TOR) by the Bank**. For all consultancy contracts as well as all single source selections, irrespective of the contract value, will be subject to prior review by the Bank.

iv. **Consultant Procurement Packages**. The procurement packages for consulting services that will be subject to Bank prior and post review were provided in the project procurement plan reviewed and approved during negotiations.

v. **Training**. This category will cover all costs related to the carrying out of study tours, training courses and workshops, i.e., hiring of venues and related expenses, stationery, and resources required to deliver the workshops as well as costs associated with financing the participation of community organization in short courses, seminars, and conferences, including associated per diem and travel costs. Training projects will be part of the Annual Work Plan and Budget and will be included in the procurement plan. Prior review of training plans, including proposed budget, agenda, participants, location of training, and other relevant details, will be required only on an annual basis.

vi. **Operating Costs.** Operating costs relate to the project implementation services to be provided to the project. These will be procured using the Borrower's administrative procedures, acceptable to the World Bank. Lists of eligible expenditures applicable are spelt out in the Financing Agreement and PIM. The PIM will elaborate the applicable administrative procedures that will be followed and which will have been reviewed and found to be acceptable to the Bank.

Environment and Social (including safeguards)

Environmental

32. Based on the project screening, the project was assigned Environmental Category A. The project screening identified a number of proposed activities that can potentially have high environmental risk, however the screening confirmed that most of the project activities will have low to moderate potential adverse environmental impacts. High risk activities: tailings dam closure, upgrading of the Kabwe solid waste management facility, lining of Kabwe canal. Other activities with identified environmental footprint include in-situ soil remediation program, local health interventions, laboratory upgrading, local level agricultural extension projects - vegetable and soya processing, greenhouse construction, etc. As the design of the proposed activities had not

been decided before project appraisal, the PCU developed an ESMF to provide the screening mechanism, identify potential impacts, and provide guidance for developing subproject specific ESIA/ESMPs. The proposed activities trigger a number of safeguards policies.

Table 3.8: Summary of Safeguards Policies

Safeguards Policies	Triggered?	Explanation (Optional)
Environmental Assessment OP/BP 4.01	**Yes**	The majority of the proposed project activities are expected to have mostly moderate environmental impacts, which can be readily mitigated through an environment and social impacts assessment process. However, the project was categorized as A, as the Project will support a number of higher risk activities, such as the closure or rehabilitation of TDs; remediation of contaminated hotspots in Kabwe; development of solid and hazardous waste disposal facility in Kabwe; and improving the drainage and flow of Kabwe canal. Other planned activities with low to moderate risks include capacity building interventions, lab equipment upgrading, lead poisoning treatment program for target population in Kabwe, and small scale community driven projects in support of environmental health outcomes (nutritional support, income generation small grants). All site specific details and design will be informed through a demand driven and consultative approach. Since the exact locations of the activities and scope of works are not yet identified, the relevant instrument is an Environmental and Social Management Framework (ESMF). An ESMF has been prepared, consulted upon, publically disclosed on July 12, 2016 in country and July 20, 2016 through InfoShop. The ESMF guides the screening of the sub-projects and their categorization and also the development of ESIA and/or ESMP once specific activities and locations have been identified. The ESIA/ESMPs will be prepared, consulted with local communities and disclosed prior to commencement of detailed planning and physical works. Management and supervision requirements for the physical, chemical and biological environment (waste, water and sanitation etc.), health and safety of construction workers and safety and security of neighboring communities are built into the ESMF.
Natural Habitats OP/BP 4.04	**No**	This policy is not triggered in relation to anticipated project activities as there are no evidence of direct or indirect significant impacts on natural habitats, fauna, flora, or biodiversity either due to proximity or due to extended impact during construction and/or operations. The ESMF includes guidelines to avoid as much as possible projects affecting natural habitats (e.g. by choice of location / alignment of physical investments), as well as screening checklists and relevant mitigation measures to avoid or, if unavoidable, minimize, mitigate, compensate or offset (following the mitigation hierarchy) impacts on fauna and flora and natural habitats. Any sub-projects negatively affecting critical natural habitats will not be considered for financing.
Forests OP/BP 4.36	**No**	The policy is not triggered as the project activities are not expected to overlap or cause adverse impacts on forestry reserves. The ESMF provides measures to avoid potential environmental and social impacts, in case of sub-project that may be associated with forests.

Safeguards Policies	Triggered?	Explanation (Optional)
Pest Management OP/BP 4.09	**No**	The project will not support the purchasing or use of pesticides. The local level interventions for support to environmental health will be designed to avoid the use of agri-chemicals. The ESMF includes recommendations and guidelines for use of non-chemical fertilizers and pesticides, where possible.
Physical Cultural Resources OP/BP 4.11	**Yes**	The policy is triggered as a precautionary measure to ensure the ESMF and ESMPs include measures to handle cultural resources as the project involves significant excavations and movement of earth. However, the project activities are unlikely to find physical cultural resources in the identified project areas. There are no known historical, cultural and archeological resources in the Copperbelt and Kabwe area, which has been under mining operations for the last 100 years. The ESMF includes a procedure to handle potential chance finds.
Indigenous Peoples OP/BP 4.10	**No**	Screening has confirmed the absence in the project area of people who meet the criteria of OP/BP 4.10.
Involuntary Resettlement OP/BP 4.12	**Yes**	OP/BP 4.12 has been triggered as a precautionary measure. 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 an unlikely situation when there may be temporary impacts on livelihoods due to restriction of access under Component 1 or Component 3, such as closing and rehabilitation of TDs, 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.
Safety of Dams OP/BP 4.37	**No**	The policy is not triggered as most TDs are not designed as water retaining structures. The project would focus on demonstration of environmentally sustainable rehabilitation and safety improvements of the selected TDs.
Projects on International Waterways OP/BP 7.50	**No**	The policy is not triggered
Projects in Disputed Areas OP/BP 7.60	**No**	The policy is not triggered

Social

33. **Mainstreaming Citizen Engagement throughout the project life cycle.** Lessons from the earlier CEP project highlight the important role of the pollution-affected communities in representative decision-making. Intensive citizen engagement at all levels of project planning and implementation is a distinct objective of the project investments, particularly in local government service delivery, such as health, education, livelihoods support and infrastructure program. The preliminary consultations with communities indicate that an attitudinal change is required at institutional level, to cover the affected and vulnerable populations. The project is focusing significantly on working with local municipal authorities and the local population to design the investments, support monitoring at the community level, share project benefits, improve quality of life of affected communities, and revive the image of contaminated towns such as Kabwe.

34. **Increasing social capital through livelihood activities.** Participatory approach is central to the design and selection of the investments under ZMERIP. The project includes a dedicated component C.2, which will fund community driven income generating activities to address environmental health hotspots in target municipalities. Residents of the identified hotspots, especially most vulnerable members, are likely to have poorer nutritional status and to be engaged in activities like mining contaminated soil, thus getting more exposed and susceptible to environmental health risks. The project livelihood support activities will therefore have an allocation for the most vulnerable members living in the selected areas, including female/children-headed households, people with HIV/AIDS or disabilities, unemployed youth, etc. Zambia has experience in and has used community driven development approach in several projects to ensure inclusion of vulnerable social groups at community, ward, and district levels.

35. **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 land taking, and the design of project interventions provides an opportunity to avoid involuntary resettlement and land acquisition. The project however triggers OP/BP 4.12 for an unlikely situation that there may be some temporary impact on livelihoods under component 1 or component 3, such as closing and rehabilitation of TDs, community driven income generation projects; or as part of voluntary in-situ remediation program etc. For example, such cases may include situations where the contaminated site (such as a tailings dam) presents a high risk to the people occupying the nearby structures. A RPF has been prepared, consulted upon, and disclosed prior to appraisal of the project. 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.

36. **Enhancing gender equity through targeted input in planning interventions.** A series of consultation workshop organized with affected communities reveals that women who reside in pollution-affected areas of towns (such as Kabwe, Mufulira etc.) face multiple constraints including relatively higher exposure to unacceptable levels of lead contaminated soil in their backyards, inadequate access to health services, and limited economic opportunities. The project, therefore, will provide specific support to women's groups in sensitization, education on environmental pollution issues and capacity building to carry out the local level projects supported by the project.

Annex 4: Implementation Support Plan

A. Strategy and Approach

1. The strategy for the Implementation Support Plan (ISP) has been devised to undertake the ongoing and necessary mitigation measures to address the following major risks identified in the SORT: a) Moderate Political and governance risk given the sensitivity associated with environmental liabilities associated with earlier mining operations; b) High Macroeconomic risk is Substantial due to slowing economic growth in 2015; c) Substantial stakeholder risks due to potential health risks associated with the exposure to contamination; and d) lack of institutional capacity for project implementation and coordination. The design of the project itself contains mitigations against each of these risks. The ISP is designed to review and ensure that those mitigation measures are effective and to reinforce them where necessary. The ISP is also designed to enhance the capacity of the implementing agencies in a range of technical and specialized areas. The ISP will be undertaken by World Bank staff and is based on four major principles: (a) continual high level dialogue with the Governments of Zambia on policy and strategy concerning management of historical environmental liabilities; (b) frequent local level and field based supervision of project activities including consultation with beneficiaries in towns such as Kabwe; (c) consistent review of fiduciary procedures and controls within the implementing agencies; and (d) technical capacity building for all implementing agencies.

2. The team will support in-country forum for policy dialogue, where the approach to addressing historical and future environmental liabilities in the mining sector is discussed and reviewed. The Project Steering Committee chaired by the PS-Mines provides the right forum for such policy debate, where implementing agencies and stakeholders can reflect on constraint and opportunities related to cost and benefits of addressing “stock” and “flow” of pollution. The team will respond to government requests to learn from international best practice on this agenda, particularly in developed countries such as US, Canada and Germany which has significant experience. The project will also facilitate learning study tours to other countries and the sharing of international experience.

3. A particular focus of field visits will be to verify that selected sub-project investments have the characteristics that justify their selection for investment according to the selection criteria for the project. The Bank team will conduct due diligence on relevant documentation, data and field based conditions to ensure compliance with the selection criteria. Divergence from the selection criteria will be immediately discussed with the implementing agencies. The World Bank team will undertake regular and comprehensive fiduciary review and implementation support for the implementing agencies. This will include: review of quarterly IFRs; review of the external audit; ongoing review of internal controls; review of the performance of fiduciary staff; attention to and maintenance of procurement standards on all contracts requiring prior review; an annual procurement post review of contracts. It is envisaged that the team will work to raise the technical capacity of the implementing agencies in the following areas: (a) ability to undertake participatory and consultative planning processes at the local level and to implement community-driven development and localized health sector intervention for the affected population; (b) ability to implement and monitor implementation of remediation intervention to realize the full impact of reduced environmental health risks; (c) ability to undertake local level procurement and implementation of contracts; and (d) ability to supervise construction with attention to high

technical standards. A constructive learning approach between the implementing agencies and the Bank in the ISP will be achieved by the following: (a) use of project monitoring and evaluation systems as a tool to track results and also to contribute to performance based project management; and (b) commitment to open discussion of project constraints and challenges with a view to finding solutions, taken as an opportunity for learning and improvement.

B. Implementation Support Plan

4. The World Bank's implementation support team will include a Task Team Leader (TTL) based in Washington DC. The team will include country-based fiduciary, procurement, safeguards staff and sector specialists. The ISP will make use of the following tools for review and technical capacity building: (a) regular implementation support missions at least twice a year including field visits; (b) a Mid-Term Review, used as the opportunity to make major adjustments in project design and funding allocations, if needed; (c) use of monitoring and evaluation data for performance adjustment; and (d) seeking of trust fund resources to augment delivery of capacity building.

C. Implementation Main Focus

Time	Focus	Skills Needed
First twelve months	• Fully staff of PCU and three PIUs in ZEMA, MSD and KMC • Staff capacity assessment and development of capacity building plan • Capacity building of project staff in PIUs • Baseline data collection for monitoring and evaluation plan • Work plans for Components A, B and C • Communication and awareness raising of project • Implementation of Component B and C • Policy dialogue with government on environmental liabilities in mining sector • Information sharing and coordination with other donors/agencies supporting NGOs	Task team Leader (TTL) and environmental infrastructure specialist Mining Policy specialist Environmental Health Specialist Livelihood specialist Social Development/Community participation Financial Management Specialist Procurement Specialist Environment and social safeguards specialist Monitoring and Evaluation Communication and citizen engagement specialist
12 - 48 months	• Implementation of all components' activities • Selection of site specific investments according to selection criteria • Implementation of Component A and B with technical quality control • Community consultation and inclusion • Capacity building of project staff • Collection of M&E data • Adherence to fiduciary procedures • Continued policy dialogue with government on operationalizing EPF • Information sharing and coordination with other donors/agencies supporting NGOs	As above
48 – 60 months	• Finalization of component activities • Collection of end-line M&E data • Final technical audit	As above

D. Skills Mix Required

Skills Needed	Number of Staff Weeks/Year	Number of Trips/Year
TTL and environmental infrastructure specialist	12	At least 2
Mining Policy specialist	6	_ " _
Environmental Health Specialist	6	
Livelihood specialist	6	
Social Development/Community participation	6	
Financial Management Specialist	4	At least 1
Procurement Specialist	10	At least 2
Environment and social safeguards specialist	4	_ " _
Monitoring and Evaluation	6	At least 1
Communication and citizen engagement specialist	4	At least 1