

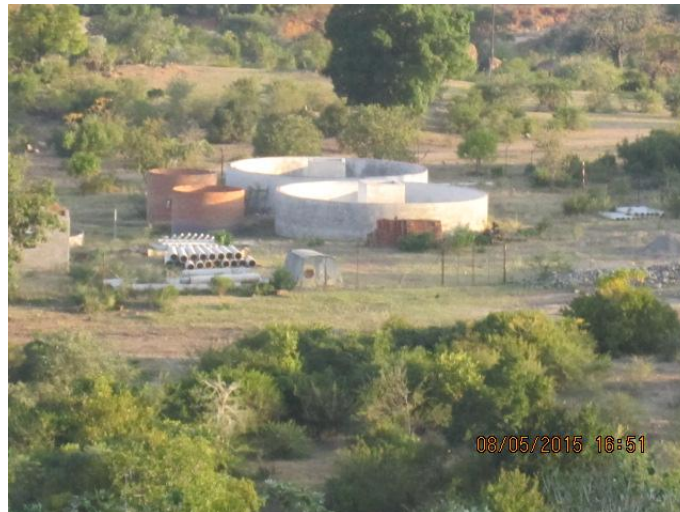


MINISTRY OF ENVIRONMENT, WATER AND CLIMATE



ZINWA

**ZIMBABWE NATIONAL WATERPROJECT
ENVIRONMENT AND SOCIAL MANAGEMENT PLAN (ESMP)**



**FOR MATAGA WATER SUPPLY PROJECT
MBERENGWADISTRICT**

CATCHMENT MANAGER

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Abbreviations

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| AGRITEX | Agriculture Technical and Extension Services |
| AIDS | Acquired Immunity Deficiency Syndrome |
| CMB | Cotton Marketing Board |
| DA | District Administrator |
| EMA | Environmental Management Agency |
| EMP | Environmental Management Plan |
| ESMP | Environment and Social Management Plan |
| GMB | Grain Marketing Board |
| HIV | Human Immuno Virus |
| MEWC | Ministry of Environment, Water and Climate |
| MGP | Mataga Growth Point |
| RDC | Rural District Council |
| SI | Statutory Instrument |
| STD | Sexually Transmitted Disease |
| ZESA | Zimbabwe Electricity Supply Authority |
| ZINWA | Zimbabwe National Water Authority |

EXECUTIVE SUMMARY

Introduction

The Government of Zimbabwe has made a request to the World Bank for financial support to finance a Small Towns Water Supply Improvement Project to be implemented by ZINWA. The project components tentatively include (i) investment in repair and rehabilitation of critical infrastructure in selected water supply stations managed by ZINWA (ii) institutional strengthening of ZINWA including project development and design, financial management, procurement project management and monitoring (iii) technical assistance to assess options for transforming ZINWA to enable it to perform its mandate more efficiently; and (iv) strengthening the capacity of urban and rural local authorities to contract with and oversee operations managed by ZINWA in line with their new mandate of being Water and Sanitation Authorities under the new water policy. A needs assessment survey of 50 small towns and Growth Points resulted in the prioritization of seven stations (one in each of the seven Catchments of Zimbabwe), which are Guruve (Manyame), Gutu (Runde), Lupane (Gwayi) Madziwa (Mazowe), Mataga (Mzingwane), Nembudziya (Sanyati) and Zimunya (Save). As part of the assistance to ZINWA to fully prepare subprojects in the seven ZINWA stations for investment, Castalia reviewed preliminary safeguards (environmental and social) assessment carried out by ZINWA for the 7 priority areas.

Project location

Mataga is located about 100kms south of Zvishavane Town and is within the Mzingwane catchment area under the Mwenezi sub basin. Mataga is the administrative capital of Mberengwa district administered by the Rural District Council who are responsible for the roads and solid waste collection. The town itself is within ward 18 although the water supply system also includes stands in wards 23 and 26.

Proposed project activities and beneficiaries

Raw water will be obtained from Mundi-Mataga dam, which has a capacity of $39 \times 10^6 \text{ m}^3$. Mataga's new treatment plant, which is still under construction, has a capacity of $100 \text{ m}^3/\text{hr}$ and it will be complemented by a 2280 m^3 reservoir which is yet to be constructed. The construction therefore includes the upgrading of the treatment plant from the current $30 \text{ m}^3/\text{hr}$ to $100 \text{ m}^3/\text{hr}$, purchasing of raw water pumps, installation of a raw water pipeline from the pump house to the new treatment plant, a clear water pipeline to the new reservoir, a 2280 m^3 reservoir and a distribution line to all the points of abstraction (Nyala & Musume). The current reservoir (1000 m^3) will help to complement storage to the new one.

Legal and policy review

The project screening was conducted in accordance with the World Bank Environmental Assessment guidelines and was categorized in category B due to the limitedness of the potential environmental and social impacts. The subproject was further screened in accordance with the Environment Management Act (CAP 20:27) and a meeting with the Environmental Management Agency (EMA) and the project was exempt from the requirements of the full environmental and social impact assessment. With this two tie screening, the agreed safeguards tool for the project is the Environment and Social Management Plan (ESMP). Despite being category B, the project triggered O.P 4.01 - Environmental Assessment, OP 4.04 - Natural Habitats and O.P 4.37 Safety of Dams because the water supply project is based on the integrity of the Zimunya Dam. This ESMP will address the requirements of the Environmental Assessment Policy and Natural habitat through the accompanying management plan while the Dam safety policy will be addressed through the dam safety inspections that will be carried out by ZINWA and furnished to the World Bank as part of project implementation and monitoring. The ESMP will be reviewed by both the World Bank and the local Environment Management Agency (EMA).

Environmental and social baseline conditions

An environment and social baseline assessment was carried out in the formulation of this ESMP and the project area consists of formally planned residential areas that have wide servitude areas for the installation of the distribution network. There are no encroachments in the road reserve and service lanes such that there is no chances of resettlement impacts. The residents are very keen to have the water supply installations and have pledged to fully support the project implementation in all facets. Mataga Rural District Council has also been enforcing the construction byelaws consistently such that there are no temporary structures within the routes of the distribution network. The residents constructed their structure in anticipation of the future water connections so there has been close cooperation and integration between the local authority and the residents. The biophysical environment has already been impacted during land clearing for residential housing construction such that there will be no incremental impact on vegetation as a result of this project. The water availability assessment also showed that there will be no water use conflicts since there is surplus water above rural agricultural and the urban domestic water requirements.

Consulted stakeholders

A number of listed stakeholders were consulted during the ESMP formulation, these include and not limited to the Mataga RDC, Irrigation Committee, District Administrator and other

Government Departments just to mention a few. In all the consultations, the stakeholders showed great reception and support for the project.

Conclusions and recommendations

The assessment concluded that the proposed subproject has insignificant negative environment and social impacts since there are no involuntary resettlements, negligible disruption to vegetation. The aquatic habitat will also not be affected since there is adequate water for all potential water users. ZINWA will however need to ensure that the backwash effluent continue to be disposed through the existing land application system. A waste disposal licence will be required for backwash effluent.

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Chapter 1

Introduction

1.1 Ministry of Environment, Water and Climate

The outline shows the structure of the Ministry of Water, Environment and Climate, including the various departments within the Ministry and the parastatals that fall under the Ministry;

Departments

- Environmental and Natural Resources Management
- Water Resources Planning and Management
- Climate Change Management
- Meteorological Services
- Finance, Administration and Human Resources
- Legal Services

Parastatals

- Environmental Management Agency
- Parks and Wildlife Management Authority
- Forestry Commission
- Allied Timbers Zimbabwe
- Zimbabwe National Water Authority

The Functions of the Ministry that are directly linked to the Zimbabwe National Water Authority include the following

- Formulate and implement sustainable policies on the development, utilization and management of water resources in cooperation with user communities and institutions.
- Design, construct and maintain medium to large size dams and water supplies to satisfy present and future domestic, industrial and mining water requirements.

- Provide clear/treated water for urban areas in consultation with the Ministry of Local Government, Public Works and Urban Development.
- Design, construct and maintain dams, weirs and boreholes to meet present and future irrigation requirements.
- Responsible for the overall/national planning, management, regulation and standardization of irrigation development and adoption of appropriate technology.

1.2 ZINWA

The Zimbabwe National Water Authority (ZINWA) is a national organisation, responsible for water resources development and management and providing treated drinking water to small towns, growth centres and government establishments in Zimbabwe. ZINWA has seven sub-offices (catchments) which are based on the seven hydrological catchments in Zimbabwe. The catchments are named as follows;

1. Mazowe Catchment
2. Runde Catchment
3. Manyame Catchment
4. Gwayi Catchment
5. Mzingwane Catchment
6. Save Catchment
7. Sanyati Catchment

ZINWA was established under the ZINWA Act of 1998 and is a body corporate institution which operates on a commercial basis.

In the last decade or so, the performance of ZINWA has been affected by many factors including the economic collapse which resulted in under-funding of both O&M and capital investment. The economic collapse also resulted in loss of skilled human resources especially to neighbouring countries. As such infrastructure deteriorated resulting in poor service delivery. Consequently customers became unhappy and unwilling to pay for the services leading to low revenue collection. This further reduced the capacity of ZINWA to operate the water and sanitation systems effectively. This did not only affect ZINWA, but also other agencies tasked to provide water and sanitation services in Zimbabwe such as local authorities. The collapse of the water and sanitation services in Zimbabwe was linked to the 2008/9 cholera outbreak which affected over 100,000 people and resulted in about 4,300 deaths.

ZINWA operates about 500 water supply stations throughout Zimbabwe. The systems are an assortment of conventional water treatment and supply networks, groundwater fed systems and sand abstraction systems. Most of the water supply systems are in need of urgent repair and rehabilitation. Water supply is erratic in most areas due to the reduced capacity of the systems coupled with recurrent breakdown of key equipment and components of the systems. There are a lot of areas where water and sanitation coverage is below 100%. In such areas communities have resorted to other alternative forms of water supply, many of them unsafe. Over the last few years especially after the cholera outbreak of 2008/9, a number of activities have been carried out mainly by NGOs and donors to restore and improve water supply and sanitation services in Zimbabwe including in areas managed by ZINWA. The aim has been to prevent a repeat of the cholera outbreak and preserve the water and sanitation infrastructure. However a lot still needs to be done in order to completely restore services and achieve sustainability.

1.2.1 Data & Research

The Department captures, processes, analyses, archives and disseminates data pertaining to surface water resources availability.

Subject to the Water Act (Chapter 20:24) and ZINWA Act (Chapter 20:25), and any other enactment, the functions of the department shall be—

- To advise the Minister on the formulation of national policies and standards on hydrology
- To undertake research studies and develop a database on hydrological issues pertaining to or of interest to Zimbabwe and to publish the findings and any other data compiled by the Authority;
- To conduct hydrological and geographical surveys and to produce maps or other information necessary in the planning, development and exploitation of water resources and to publish any such surveys, maps or other information.

1.2.2 Planning

The division is one of the divisions that perform statutory functions. Its mandate is to ensure compliance with the Water Act, national water policy and strategy requirements in relation to water resources planning, development and management. It also does the central management of water permits.

1.2.3 Quality Assurance

The division performs the following functions:

- Quality Management System
- Production and Technical Support

- Legal and Statutory Compliance
- Water Resources Protection

1.2.4 Commercialisation

- The unit identifies and guides the development of new business opportunities and initiatives, such as new and /or more effective sources of revenue, new area of investment or new technology
- Negotiates and evaluates possible partnerships, strategic alliances, joint ventures etc.
- Generating additional non-core income for the Authority.
- To continuously review the Authority's strategies on the core segments of raw water and clear water to improve the Authority's operations
- To continuously seek modern methods of operational excellence with a view to cut costs for the Authority

1.2.5 Design and Construction

The department exists to execute the following functions:

- Designing water conservation works such as dams, pipelines, reservoirs and water supply stations
- Construction of all water conservation works such as dams, canals, weirs, pipelines and others
- Ensures the maintenance and safety of water conservation works
- Supervision of contractors doing PSIP projects
- Does engineering consultancy
- Recommends appropriate standards regarding water conservation works and dam safety
- Compilation of budgets for PSIP projects

1.2.6 Groundwater and Drilling Services

The Groundwater Department of ZINWA has been involved with borehole drilling since the early 1920s and has thus gained vast amount of knowledge and skills in groundwater development in Zimbabwe.

The Groundwater Department of ZINWA provides technical advice on groundwater planning, development and management to the Ministry of Water Resources Development and Management and is therefore quite conversant with all the legal (regulatory and statutory) requirements associated with groundwater development in the country. This provides for the development and construction of high quality boreholes which meet the national standard on the

Development, Maintenance and Management of Groundwater Resources currently under formulation.

1.2.7 Information and Communication Technology

The ICT Department is responsible for the provision of effective, efficient and responsive information and communication technological services to the various authority departments. The department accepts criticism from its various stakeholders in its bid to offer world class ICT services within the authority.

The department's major offerings are internet and email service, web services, networking, procurement and maintenance of ICT hardware and software, information security and advisory role in information and communication technologies.

1.3 Overview of the Zimbabwe National Water Projects

The Zimbabwe National Water Project will have three components with indicative costing as below; Component 1: Growth Center Water and Sanitation Improvements, Component 2: Technical Assistance, including National Water Resources Master Plan; TA for a Water Services Regulator; TA to Local Authorities; Institutional Strengthening of ZINWA; and Training and Component 3: Project Management

1.3.1.1 Component 1: Growth Center Water and Sanitation Improvements:

This component will finance investments in water supply and sanitation rehabilitation and upgrading in 7 growth centers. Detailed designs (including bills of quantities and tender documents) and preliminary Environmental Impact Assessments (EIAs) were completed for all 7 growth centers in 2014 (with funding from the A-MDTF) in order to address all short, medium and long term investment needs. Investments will include expansion and rehabilitation of water treatment works, boreholes, transmission mains, storage and service reservoirs, distribution system, connections and meter installation and replacement. The works will also include minimal works to restore operation of the wastewater treatment systems in the project areas. The works planned will include clearing and desludging, repairs of inlet works and fencing and operators facilities. The investments are estimated at about US\$ 14 million. The project will be implemented in the following catchments and water supply stations: Guruve (in Manyame catchment), Gutu (Runde), Lupane (Gwayi), Madziwa (Mazowe), Mataga (Mzingwane), Nembudziya (Sanyati) and Zimunya (Save).

The seven highest priority stations for the purposes of this Project are all termed “Growth Centers” were selected from the 50 stations, one per water catchment area based on the number of beneficiaries and the expected economic benefit of the Project. The most important consideration for selection of priority stations was to address underserved areas where mostly the poor live, including where new communities have come up, or schools and clinics and other public institutions that need a supply of good, safe water. Practical considerations were also factored in such as the readiness of ZINWA designs, priority stations needing attention particularly for expansion of networks, as well as taking into consideration ZINWA’s own recommendations. Financial and economic viability was also taken into account. The selection also targeted stations with minimum environment and social impacts and specifically where there is no resettlements.

1.3.1.2 Component 2: Technical Assistance:

Technical Assistance (TA) will be provided to strengthen the capacity of the relevant national and local institutions needed to ensure the sustainability of the investments and improve the overall planning, regulation and reform of the sector. There will be five sub-components of TA:

i. Sub-component 2.1: National Water Resources Master Plan:

The Government has requested TA under the Project to develop a national water resources master plan. The Master Plan will build on the National Water Master Plan of the early 1990s and the subsequent Catchment Outline Plans developed in the mid-2000s. The Master Plan is expected to cover the following key areas: a full understanding of the quantity, quality and spatial distribution of the water resources available in Zimbabwe (surface water and groundwater); a characterization of the different uses (consumptive and non-consumptive) and users (energy, domestic, recreational, environment, irrigation, industry, mining) and an assessment of the varying demands (across catchments, national, sub-national and transboundary); assessment of the resilience of the water resources to climatic variability and indicative adaptation measures to climate change. The master plan will assess the gap between supply and demand and update previous supply assumptions using the latest climate change modelling data. Investment needs for the sector will be assessed as well as other measures needed to restore meet national development goals. It is expected that MEWC will analyze and outline the institutional mechanism necessary to manage the TA including the option of strengthening the Water Resources Sub-Committee of the National Action Committee (NAC) to assume the role of a Steering Committee for the TA

ii. Sub-component 2.2: TA for a Water Services Regulator:

The Government has decided to set up a water and wastewater services regulatory authority and has approved a Cabinet Memorandum in April 2015 to this effect. The memo proposes the setting up of a single sector regulator that would cover both water resources regulation as well as water and sanitation services. The main purpose of the regulator will be to balance the interest of the consumer – whose interest is best service at least cost – with that of providers who are generally a monopoly position, but need to receive predictable periodic tariff adjustments that are cost reflective and sustainable along with adequate access to water resources. The regulator will thus ensure that the agreed rules are fairly implemented and that all people are served with at least a basic service and at a minimum acceptable standard. MEWC requested the Bank to support the setting up of the regulator. Bank support will be through the proposed Project and through TA from the Water and Sanitation Program. The following areas of support were proposed: (i) developing a roadmap for the establishment of the regulator based on international good practice detailing: institutional options; required legislative amendments; a business and financial plan for the regulator; (ii) south-south learning exchange; (iii) integrating or interfacing Service Level Benchmarking (SLB) currently being practiced by 32 municipal councils into the regulatory process; and (iv) office setup costs as appropriate.

iii. Sub-component 2.3: TA to Local Authorities:

Two activities have been proposed by the Ministry of Local Government, Public Works and National Housing (MLGPWNH) for consideration under this sub-component. TA to support Local Authorities and ZINWA formalize water service agreements: Six of the proposed investments under this project are all in the jurisdiction of Rural District Councils. The seventh, Lupane, was re-categorized as an Urban District Council in 2015. As the capacity of these councils is limited – most not having or being in a position to hire an engineer – MLGPWNH and MEWC confirmed that the councils would need to develop a service provision agreement with an operator to ensure the sustainability of the proposed investments. In line with the 2013 National Water Policy all of these Local Authorities – as the Water Service Authority – will need to develop a water service provision agreement with a service provider for the investment, operation and maintenance of the water production operations. In some cases this service provision agreement should also cover sewerage. The project will assist Local Authorities and ZINWA pilot these agreements, either through formal Water Service Agreements or through Memoranda of Understanding between both parties. The clear separation of roles between the Water Service Authority (the Local Authority) and the Water Service Provider (in this case ZINWA) will also allow for future potential private sector participation through local operators or other.

Promoting Sanitation Improvements in Small Towns: Sanitation in small towns is a major challenge and institutional responsibility for it is unclear. It is proposed that MLGPWNH will develop a TOR for a sanitation assessment to be carried out. Some investments will be channeled towards improving identified sanitation needs as appropriate. In two of the small towns (Gutu and Zimunya) existing waste stabilization ponds, currently under the management of ZINWA, will be rehabilitated. Options for community mobilization for sanitation will be identified, and where necessary potential for community revenues using wastewater implemented (small irrigation, growth of duck weed, etc). Sanitation promotion and hygiene education will also be considered during project preparation.

iv. Sub-component 2.4: Institutional strengthening of ZINWA:

In 2014, at the request of ZINWA, the Bank financed a skills audit and strategic gap analysis to identify key areas to strengthen ZINWA. Three key areas were identified as priorities: (i) a need to separate the utility and water resources function of ZINWA – as identified in the National Water Policy; (ii) a lack of commercial orientation and (iii) a lack of customer focus and poor stakeholder management. The following areas have been proposed for support under the project.

Improving the commercial and customer care orientation and functions of ZINWA: Financial records of ZINWA indicate that it is currently not in a good financial situation and is making losses. Some of the key drivers for ZINWA to be in this situation include high non-revenue water and low revenue collection. The assessments carried out on ZINWA highlight the institutional inadequacies of ZINWA as one of the key issues needing attention. There is no full-fledged commercial department in ZINWA that is charged with managing its day-to-day commercial functions that include (i) customer care, (ii) dedicated debt management (iii) connections, and (iv) metering; (v) non-revenue reduction and (v) billing. ZINWA has recently established a “commercial unit”, however the mandate of this unit is to explore new business opportunities for ZINWA. Under the project it is proposed that a consultant be hired to assist ZINWA to design and setup an effective commercial services department which shall have as its main functions revenue generation through connections, metering, billing, and revenue collection including debt management. The consultant will assist ZINWA in developing/refining its service and customer charters, set up a customer care unit and propose a road map for a fully-fledged modern and responsive customer care unit. The improvement in customer care functions will improve the image of ZINWA and lead to better complaints handling resulting in enhanced willingness to pay by customers. The commercial services department will also manage customer care function.

Citizen Engagement:

There is a realization that effective engagement of citizens will lead to better service delivery and accountability. The Beitbridge Impact Assessment, for example, makes a number of general recommendations on how to maximize state building dividends in infrastructure projects, such as: (i) identify and address inequalities that may be long-standing or that have emerged during recent crises; (ii) support local authorities (in this case RDC/ULA and ZINWA) to clearly brand improvements in service delivery to ensure citizens recognize that it is government institutions that are delivering results; and (iii) collect base-line and end-line data on citizen attitudes and confidence in domestic institutions to assess whether investment has changed citizens perceptions. Government is moving towards requesting state enterprises including ZINWA to provide people-centered services. It is also pressing for greater citizen engagement and accountability. The National Water Policy also states the need for customer and stakeholder involvement as a way of increasing accountability in the water sector. In recent months ZINWA has established water committees in areas where it supplies water including some of the project areas. The project will finance a TA to develop a citizen engagement and commercialization strategy for ZINWA building on current initiatives by ZINWA and drawing from the general guidelines and recommendations of the water policy and other government policy documents. This activity will require close consultation and collaboration between ZINWA and local authorities. The strategy should address among other things gender and vulnerable groups including HIV and Aids. The TA should also propose possible institutional arrangements/realignment of ZINWA to be able to effectively deal with citizen engagement. Activities including under citizen engagement, which will most likely fall under the commercial department, will also need to be complementary with the stakeholder consultation under the safeguards work.

Gender:

The Bank will assist the Government to develop a gender strategy for the Project, and suggested that the Government consider involving the Ministry of Gender in the appropriate way.

v. Sub-component 2.5: Training:

MEWC will develop a training plan, together with ZINWA and other relevant agencies, for support under the Project. The training plan will include training needs of all project implementing entities, such as MEWC, MLGPW, and Local authorities in the project areas, but will focus on the operational training needs required by ZINWA to implement the project and ensure sustainability of the investments. There will also be on-the-job training through mentoring by consultants hired to support the PIU. The needs assessments have identified capacity gaps in the areas of utility management (commercial and customer care functions, non-revenue water management), asset management, project management, procurement, safeguards

and, monitoring and evaluation. From the assessments and discussions with ZINWA and other key stakeholders it is evident that there is need to strengthen ZINWA, and other agencies, in these areas. ZINWA is also not familiar with World Bank procedures and policies for project implementation. This is due to the absence of World Bank support for nearly two decades during which period most government entities including ZINWA has not implemented Bank financed projects.

1.3.1.3 Component 3: Project management:

ZINWA will set up a Project Implementation Unit (PIU) to manage the project. The PIU will directly manage component 1 and act as secretariat to the various lead ministries for sub-component 2.1, 2.2 and 2.3. The PIU will be staffed with 5-7 staff, including a Project Manager and include competence in engineering, procurement, financial management, safeguards and monitoring and evaluation. The PIU may also have secondees (focal point officers) from other entities participating in the project. The Project Manager, shall be the link person with the World Bank and will work closely with each Project Implementation Team (PIT) established in the catchments. The PIU shall be responsible for monitoring progress in each catchment and shall be responsible for all procurement. The PIU shall also be responsible for : (i) overall coordination of project activities; (ii) managing the project's special account and ensuring proper and timely project accounting and reporting of project expenditures (iii) preparing consolidated progress reports. The Project Manager will use the quarterly reports from the PITs in the catchments to prepare a consolidated progress report. The report should cover: (i) progress to date in the implementation of the project; (ii) challenges and proposed actions to address them; (iii) status of the procurement process of key goods and materials; and (iv) status of disbursement and projection (v) the environmental and social safeguards and (vi) monitoring and evaluation. The PIU shall submit the report to the Government and the Bank. The PIU will also serve as its Secretariat and shall coordinate the PSC meetings and prepare minutes of the PSC meetings.

1.3.1.4 Project Implementation Team:

A Project Implementation Team (PIT) will be established at catchment level to implement the sub-project in the catchment and coordinate all other project activities that will involve the catchment. The PIT shall comprise the Operations Engineer, safeguards and financial support staff, secondees from the Local Authorities and other staff as appropriate. The Operations Engineer shall be the PIT Team leader and shall report to the Project Manager and the Catchment Manger via the Operations Manager. The Catchment Manger shall be tasked with overseeing progress on works in the catchment. The PIT will be responsible for day-to-day activities related to the project. It shall be responsible for drawing/approving specifications of goods, works and services in the catchment including preparing procurement requests to be forwarded to the PIU. The PIT shall also be responsible for daily supervision and certification of works, preparation of

payment certificates, receiving and verifying material specifications as well as maintaining accurate project records (materials, work done and labor and equipment returns). The PIT shall also oversee the consultants working on activities in the catchment. The PIT is expected to meet regularly and shall prepare progress reports covering progress to date, disbursement progress , update on procurement , safeguards compliance, monitoring and evaluation aspects, bottlenecks affecting progress and proposed measures to address them and plan of action for remaining works and, progress and disbursement projection.

1.3.1.5 Monitoring and Evaluation:

The project will play close attention to M&E as this is the first investment project in Zimbabwe in over a decade, and can inform future investments in the water sector and other sectors. ZINWA will set-up an M&E system in the PIU that will report to the Project Steering Committee and the Bank. The PIT in each catchment will conduct regular (monthly) reviews to assess physical progress, implementation of this ESMP, progress towards targets including connections, identify implementation bottlenecks and propose solutions to speed up progress and a program. The PIT will prepare monthly reports based on these reviews and forward to the PCU. The Project Coordinator will use the quarterly reports from the catchments to prepare a consolidated progress report. A consultant will be hired to assist the PCU and PIT in conducting periodic monitoring and evaluation and preparing M&E progress reports. The PCU should send the monthly progress report to the SC and share the same with the Bank.

1.4 Scope of the ESMP

The scope of this process of ESMP shall be implemented in Mataga Growth point and Gwavi-Mutangwi treatment works for a maximum of at least three years.

1.5 Potential users of the ESMP

Overally this document will communicate environmental and social expectations and requirements throughout the project team, that is, from the Financier, implementing/supervising agency, beneficiaries, contractors and any other key stakeholders. Below are some of the stakeholders that will be expected to find this ESMP useful.

1. World Bank

As the Financier, it is World Bank's objective to avoid, where practical, unacceptable adverse environmental, social and/or economic impacts from this project. They would obviously not fund any project that has adverse environmental and social impacts, hence they have a keen interest in making sure that the outputs or impacts from the project do not have a negative bearing on the World Bank's core values and vision.

2. ZINWA

ZINWA as the national water utility in Zimbabwe owns the infrastructure that will be rehabilitated and new infrastructure that will arise from this project. Overall, ZINWA has the responsibility for planning, implementation, monitoring and enforcement of activities associated with this project. Therefore ZINWA, through this ESMP will seek to ensure that all works, infrastructure and services that will become a temporary or permanent feature of Mataga do not have an adverse effect on the environment or socially on all the key stakeholders.

3. Contractors

This ESMP is also to be utilized by the contractors commissioned by ZINWA or the funding institution (World Bank) for the project and will form the basis of site-specific management plans that will be prepared by the contractors as part of their construction methodology prior to works commencing. Therefore, all contractors and subcontractors shall comply with and apply the ESMP requirements as applicable to the tasks they are employed to undertake.

4. Rural District Council

Mberengwa RDC, among other things are in charge of conservation of natural resources, control of bush fires, grazing, animal diseases, sewerage works, pollution, and effluent or refuse selection, collection and disposal . In addition to the powers bestowed upon them, Rural District Councils are the Development and Planning authorities within their respective areas of jurisdiction. The Act empowers them to plan for the overall development of the Districts, hence the reason why they are one of the major stakeholders. In order to safeguard their interests, they must make sure that this project complies with all the necessary requirements in terms of priorities and approved development plans. This means that the ESMP becomes a very important reference document for the RDC.

5. General public/Consumers/Business community

The project is all about improved service delivery in Mataga and the surrounding areas. The general public, business community and all potential consumers have a part to play in that they must make sure that all their interests, concerns, needs and requirements relating to the project have been addressed fully. Informed participation from them is key for the project to succeed hence the ESMP document is a good record for them to refer to.

6. Environmental Management Agency

The Environmental Management Agency is takes one of the first steps in screening any project on the basis of environmental and social aspects. This document outlines any impacts (positive and negative) of the project as well as any mitigation steps hence EMA will take a keen interest in the planning of the works and to make sure that the national, regional and local interests in terms of environmental and social issues are catered for.

Chapter 2

Project Descriptions

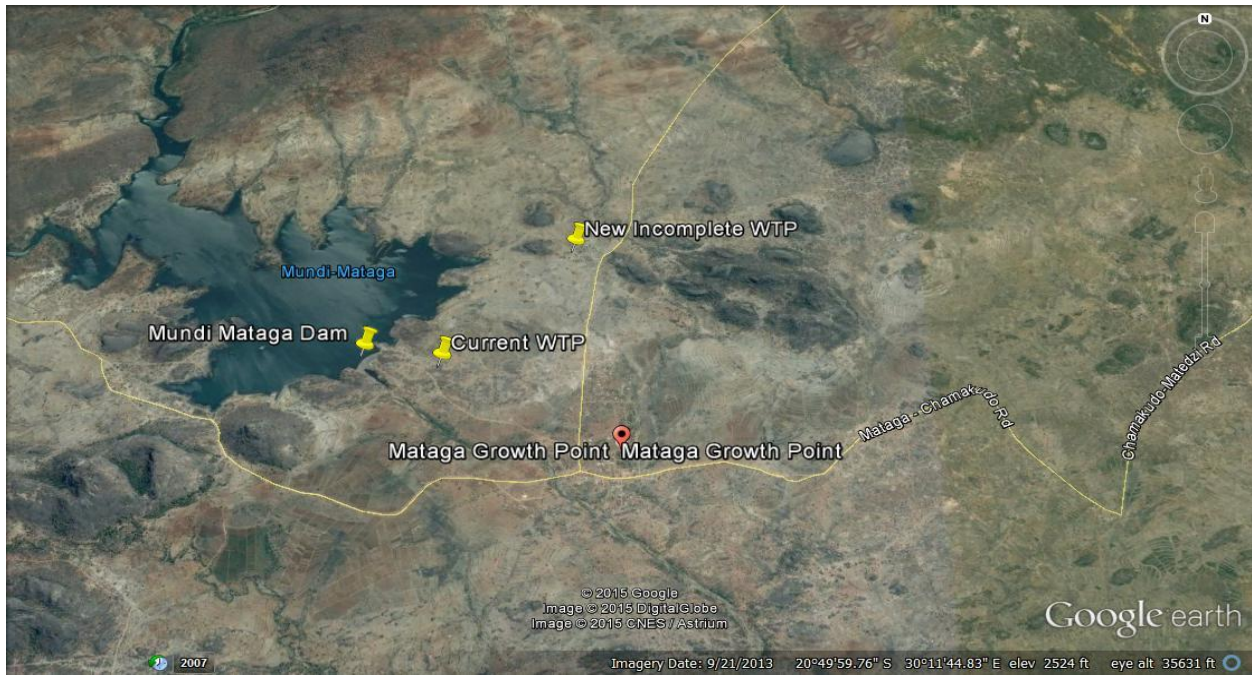
2.0 Introduction

Mataga is situated in the southern part of Zimbabwe within the Mzingwane Catchment, in Midlands Province. It occurs within Agro-ecological region V with an average annual rainfall of less than 450mm. The core livelihoods in surrounding areas are subsistence mixed farming with a bias to animal husbandry by rural communities. Major livelihoods strategies and occupations in the growth center are small General Dealer (hardware and grocery shops) and its work force as well as government employees (mainly police, teachers and nurses. The rest of the workforce comprises of local authorities (RDC) and service parastatals such as ZINWA, Agritex, GMB, TelOne, ZESA, Delta and others. There are a few light industries (welding and carpentry) and commercial enterprises such as banks and insurance companies. The bulk of the population is involved with vending of a variety of goods and wares ranging from fruits and vegetables, grain, clothing and hardware largely in open markets.

2.1 Project location

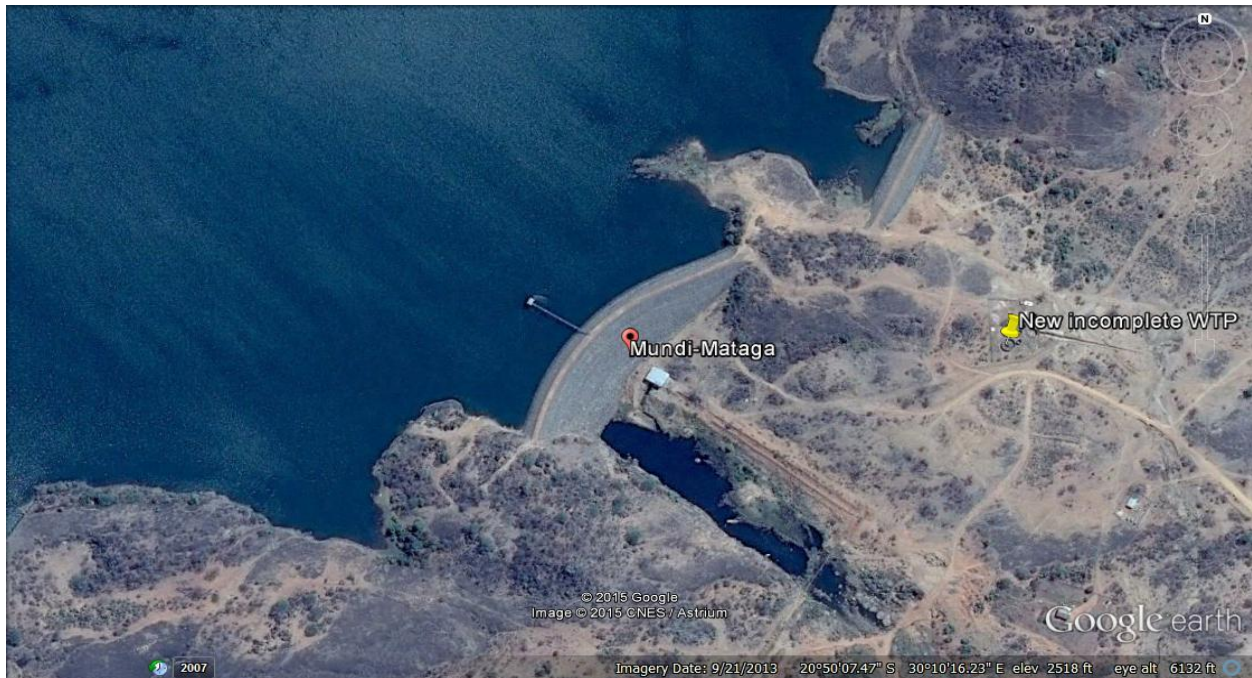
Mataga is located about 100kms south of Zvishavane Town and is within the Mzingwane catchment area under the Mwenezi sub basin. Mataga is the administrative capital of Mberengwa district administered by the Rural District Council who are responsible for the roads and solid waste collection. The town itself is within ward 18 although the water supply system also includes stands in wards 23 and 26. The Mataga Growth point is shown in the google earth map

below:



Map1

The two project site of Mundi- Mataga dam and incomplete treatment plant is also shown in the google map2 below:



Map2

2.2 Project description

The Growth Point's population is estimated at over 4 000. The center also services Musume Hospital, a big Lutheran Mission health service center with over 250 beds and 48 staff houses. The project is aimed at catalyzing the connection of water to approximately 1 000 residents in addition to boosting the delivery of water to existing connected residents numbering about 3 000, and unspecified rural villages along the Mataga-Musume treated mains, houses and shops at Musume Primary and Secondary Schools as well as Musume Business Centre. As part of the Growth Point, there are 2 Secondary Schools and 2 Primary Schools as well as a Clinic.

Raw water will be obtained from Mundi-Mataga dam, which has a capacity of $39 \times 10^6 \text{m}^3$. Mataga's new treatment plant, which is still under construction, has a capacity of $100 \text{m}^3/\text{hr}$ and it will be complemented by a 2280m^3 reservoir which is yet to be constructed. The construction therefore includes the upgrading of the treatment plant from the current $30 \text{m}^3/\text{hr}$ to $100 \text{m}^3/\text{hr}$, purchasing of raw water pumps, installation of a raw water pipeline from the pump house to the new treatment plant, a clear water pipeline to the new reservoir, a 2280m^3 reservoir and a distribution line to all the points of abstraction (Nyala & Musume). The current reservoir (1000m^3) will help to complement storage to the new one.

2.2.1 Scope of works

Complete the WTW at Mundi Mataga Dam with the following;

- Installation of new raw water pump sets within the existing pump station,
- Installation of a new raw water main between the above pump station and the head of the new WTW (700m in length),
- Installation of all pipework, valves and controls to the sedimentation tanks and filters and completion of the structural works,
- Fitting out of the existing pump station with new equipment,
- Roofing of the clear water reservoir,
- Installing a new bulk electrical supply to the WTW, including a new transformer, which would require about 500m of overhead 11kV line, and
- Conversion of the existing WTW into clear water reservoirs.
- Replace filter media for more effective backwashing
- Replace dosing equipment, raw/clear water gauges and raw water meter
- Rehabilitate intake structure
- Replace backwash tank, motors, starters, valves
- New distribution pipe work connection (old and new households)

2.3 Project Cost

The project is divided into three phases known as, Immediate term, Medium term and Long term Phases. The total project cost about USD **1.6 Million**. The monitoring of implementation and delivery of the ESMP for this sub-project has not been included in the project cost, but has been captured in the Project Management Cost for the ZNWP.

2.3.1 Immediate Term Fix Phase

These are immediate improvements and can be summarized as follows:

- Mount the suction line to the raw water pump on a pontoon so that the draw off point is 1 - 1.5m below the water level to improve the water quality.
- Change the filter media in its entirety as it has outlived its life span and suffers from insufficient pressure for effective cleaning by backwashing.
- Install a bulk meter on the treated water line adjacent to the reservoir.
- Procure water quality test equipment for the station to ensure quality control.

The Immediate term cost estimate is indicated below:

Table2: Estimate Cost for Phase 1

| Phase | Total Estimate Cost |
|--------------------------------|----------------------|
| Immediate Term (excluding VAT) | \$ 259,700.00 |

2.3.2 Medium Term Phase

The investment needs will include the following:

- Replace gate valves,
- Expand infrastructure for new connections
- Install pressure gauges, bulk meters, refurbish pump shed,
- Procure diesel pump set, and Low lift pumps as well as high lift stand by pumps

The estimated cost is shown in the table below:

Table3: Estimate Cost for Phase 2

| Phase | Total Cost Estimate |
|-----------------------------|---------------------|
| Medium Term (Excluding VAT) | \$455,291.00 |

2.3.3 Long Term Phase

These are long term and high cost investments and include the following works:

- Construct Supply line for Gwava Mutangwi

- Complete treatment plant
- Construct new reticulation lines
- Electrification of new WTW

The estimate related costs for this phase is indicated in the table below:

Table 4: Estimate Cost for Phase 3

| Phase | Total Cost Estimate |
|-----------|---------------------|
| Long Term | \$647,240.00 |

Chapter 3

Legal and Institutional Framework

3.1 Zimbabwean Legal Framework

The Zimbabwean legal and policy framework for environmental assessment and management highlights the following points:

- a) Environmentally responsible investment and development in Zimbabwe must be encouraged through transparent, predictable, equitable and effective administration of the EIA policy.
- b) The long-term ability of natural resources to support human, plant and animal life must be maintained. A broad diversity of plants, animals and ecosystems must be conserved.
- c) Natural processes such as the recycling of air, water and soil nutrients must be conserved.
- d) Irreversible environmental damage must be avoided and any inevitable environmental damage must be minimized through innovative mitigation.
- e) The basic needs of the people affected or likely to be affected by a development proposal, including food, water, shelter, health and sanitation must be met.
- f) Social, historical and cultural values of people and their communities must be conserved.

In brief, the purpose of the EIA policy is based on the incorporation of sustainability principles in project planning, evaluation and monitoring. It is also based on the understanding that many decisions concerning the environment are dependent upon meaningful public consultation and that upon being accepted, various government agencies with a mandated interest which include the Environmental Management Agency (EMA), should implement the EIA results on behalf of the Ministry of Environment Water and Climate. EMA is accordingly responsible for the EIA/EMP review, implementation and enforcement. The EIA policy also explicitly pays particular attention to the distribution of project costs and benefits in the spirit that as much as possible, development projects should support local as well as national growth. ***A minimum standard is that local people must be no worse off than they were before a project is implemented.*** It is in this spirit that formal ESMP documents should be openly accessible to all stakeholders during the scoping stage.

3.1 Administration of the EIA Policy

The Director-General of EMA has been delegated the responsibility for overseeing the processing of ESIP and ESMP submissions. The Minister is empowered to prescribe any activity, policy or program that in his/her view may cause significant environmental impacts or community disruption. A prescribed activity cannot receive the required authorizations to

proceed from the relevant permitting authorities unless, and until, the Ministry has exempted the activity from the requirements of the EIA policy or has granted 'EIA Acceptance'. EIA acceptance is granted when the Ministry determines that the assessment of an activity has been sufficiently thorough to adequately identify the environmental impacts, which it is likely to cause, as well as measures for managing them. All formal submissions under the EIA Policy are made to the Ministry through the Environmental Management Agency (EMA). Pertinent pieces of legislation include;

3.1.1 Environmental Management Act (20:27)

The Environmental Management Act provides for the sustainable management of natural resources and protection of the environment; the prevention of pollution and environmental degradation. The Act covers Environment Impact Assessment for new projects, standards to be adhered to on emissions, conservation of resources and environmental monitoring. Several aspects of this Act are relevant to the seven water supply upgrade projects. While water abstraction projects are prescribed projects listed in the First Schedule as activities for which environment impact assessment is required, the current projects qualify for exemption on the grounds that they are refurbishment/upgrade projects which occur on converted sites. The Act and Statutory Instruments are based on set principles that serve as guidelines for decision-making on policy implementation and these are summarized as follows;

- the EIA must enhance and not inhibit development by contributing to environmental sustainability and is a means for project planning, not just evaluation,
- the EIA policy depends on the normal regulatory functions of permitting authorities to implement the EIA results,
- the EIA policy involves the participation of all government agencies with a mandated interest in the benefits and cost of a project
- the EIA policy pays particular attention to the distribution of project costs and benefits, and
- identification of project impacts and public consultation is an essential part of the EIA policy

The current subprojects, subject to EMA exemption, will need an ESMP for purposes of managing the few negative impacts as well as boosting the obvious positive impacts.

A number of Statutory Instruments (SIs) have been promulgated in support of the Act as follows;
Waste and Solid Waste Disposal Regulations – SI 6 of 2007

This SI regulates the disposal of waste (solid waste and effluent). It prohibits any person from disposing waste into a public stream or ground water without a licence. The SI uses the polluter pays principle through licensing which is according to the following classes:

- **Blue:** *in respect of a disposal that is considered to be environmentally safe*
- **Green:** *in respect of disposal that is considered to present a low environmental hazard*
- **Yellow:** *in respect of a disposal which is considered to present a medium environmental hazard, and*
- **Red:** *in respect of a disposal that is considered to present a high environmental hazard*

This means that the waste streams from the project from the planning through construction phase to the operation phase should not be in the red category. **In line with SI 6 of 2007, ZINWA should obtain effluent discharge licenses for the backwash effluent. For Zimunya, it is expected that the license will be in the blue owing to the land application of the effluent.**

Environmental Management (EIA and Ecosystem Protection) Regulations - SI 7 of 2007

The SI deals with regulation of the EIA process and protection of ecosystem. Part II of the Act provides that no project shall be implemented without an EIA having been done. These regulations provide the method of doing the EIA. The developer has to submit a prospectus to EMA who will screen the project for the fully EIA, ESMP or complete exemption. In preparing an EIA, a developer is obliged to consult widely with all stakeholders. The Statutory Instrument prohibits extraction, possession, transportation of sand and clay deposits for commercial purposes without a licence issued by the Agency. The SI also provides for the prevention of veld fires, protection of wetlands and public streams.

This is pertinent for the current project. The proponent will need to ensure that no veld fires are caused by workers at the project site. Licences may be necessary for sand abstraction and transportation, if required. **This ESMP is part of the fulfillment of the requirements of this legislation.**

- **Hazardous Substances, Pesticides and Toxic Substances Regulations - SI 12 of 2007.**

This instrument prescribes the conditions which have to be observed by employers over the handling of hazardous substances at the workplace, conditions for transporting hazardous substances and procedures to be followed when there is an accidental spillage of the hazardous substances. EMA is empowered to issue spot fines to any person who violates the law. In addition, any person whose substances affect the environment is liable to pay for the cost of restoring the environment i.e. polluter pays principle. The offender is also liable to pay compensation for any damage caused by the offence to any person. The hazardous substances handled during the construction phase of the subprojects include oil and fuel. **In line with this**

legislation, ZINWA needs to obtain hazardous substances storage license for its chemical storage at the water treatment plants.

- Environmental Management (Atmospheric Pollution Control) Regulations, 2009

The objective of the SI is to provide for the prevention, control and abatement of air pollution to ensure clean and healthy ambient air. It provides for the establishment of emission standards for various sources such as mobile sources (e.g. motor vehicles) and stationary sources. It also covers any other air pollution source as may be determined by the Minister in consultation with EMA. Emissions limits for various facilities and vehicular transport have been set. EMA will issue emission licences for processes that are prescribed under the SI. These licences also embody the “polluter pays” principle. The licences have four bands that is the blue, green, yellow and red. Classification depends on two important variables, the concentration of the emission and the mass flow. Any process which emits emissions above the red class upper threshold value will not be licensed. The emission licences are issued subject to the following conditions; the licence expires on the 31st of December of the year of issue, the licence is not transferable. The SI will affect emissions from vehicles, generators and pumps/engines as well as dust emissions. **There is no real legal compliance requirement for the project besides that ZINWA should ensure the mobile equipment, diesel engines and vehicles are serviced adequately, but there is no license required for such.**

3.1.2 Rural District Councils Act (29:13)

Section 71 (First Schedule) lists the powers of the Rural District Council. Among other things, these include conservation of natural resources, control of bush fires, grazing, animal diseases, sewerage works, pollution, and effluent or refuse selection, collection and disposal etc. In addition to the powers bestowed upon them, Rural District Councils are the Development and Planning authorities within their respective areas of jurisdiction. In this regard, the Act empowers them to plan for the overall development of the Districts.

As development and planning authorities, they are also expected to be aware and guide all development activities carried out by governmental and non-governmental organizations and the private sector within their jurisdiction. Any development that takes place within the Rural District Council’s area of jurisdiction should be carried out within the provisions of the council’s priorities and approved development plans to allow for coordinated and collective approach to development. **RDCs also issue permits for sand abstraction and this project will have to comply with the necessary permits from the RDC.**

3.1.3 Parks and Wildlife Act (20:14)

The Act is administered by the Zimbabwe Parks and Wildlife Authority and deals with preservation of plants and animals, including specially protected animals and indigenous plants. Special protected plants may be protected on land for construction purposes and these should be

replanted. The construction and development team should not engage into activities which violate this Act. The lists of specially protected animals and indigenous plants are specified in the Sixth and Seventh schedule of this Act respectively. No person shall hunt or pick any specially protected species unless they have a permit to do so.

Section 40 of the Act lays down controls on hunting and removal of animals and plants thereof from national park areas and the sale of products thereof. Any person hunting any animal in a parks area, removing any animal or part of it, or selling any animal, plant or part of it which has been hunted or which has died in or been removed from a park area, in contravention of regulations for the park area shall be guilty of an offence. **This act does not really apply to the Zimunya baseline since there are no game parks or any noted wildlife presence due to the human habitation.**

3.1.4 Public Health Act (15:09)

This piece of legislation creates the legal framework for the protection of public health in Zimbabwe. Part IX of the Act prohibits the creation of nuisances. Nuisances are defined in this section and local authorities are required to maintain cleanliness and prevent nuisances. Nuisances include premises that promote the spread of infectious diseases, pools of water that may serve as breeding places for mosquitoes, polluted domestic water and accumulation of refuse and any overcrowded dwellings as to be injurious or dangerous to the health of inmates. Relevant to this proposed project is the possible nuisance arising from litter, dust, noise and stagnant pools of water especially during the construction phase.

Under the Act if a person has been served a notice to remove a nuisance and fails to comply, they will be required to face a magistrate and pay a fine for not complying with the requirements of the notice within the specified time period. Nuisances are of importance in all phases of the operations and care should be taken to keep the project sites clean and free of any nuisances. **In line with this regulation, ZINWA should ensure that there is adequate water and sanitation facilities for the employees and contractors.**

3.1.5 Forestry Act (19:05)

Section 38 of the Act provides for the preservation and protection of trees or fruit produce. Section 39 provides for the protection of forest or trees from cutting. The proponent should comply with provisions of this Act. The location of the project infrastructure will be in such a way as to minimize the cutting down of trees and protect all endangered species if any are identified within the proposed project site. Construction workers will be discouraged from cutting down trees for fuel/energy. Section 34, Part 2, of this Act stipulates that the reduction of a national forest by more than 1% will require the written permission from the Minister of Environment.

3.1.6 Water Act (20:24)

Section 101 of the Act contains legislation against pollution of any water and this is also reinforced by regulations from the Environmental Management Act. The discharge of effluent or waste water into any water body will be regulated by permits to which conditions will be attached, subject to prescribed standards and for which fees are payable (see also EMA Act). Permits relating to water abstraction and water storage are granted in accordance with this act. The various waste streams will be subjected to this legislation.

3.1.7 Regional Town and Country Planning Act (29:12)

The Act provides for the planning of regions, districts and at the local level in order to conserve and improve the physical environment. It is also concerned with efficiency and economy as well as providing mechanisms for the control of all developments. Development permits for new projects are granted under this Act. This has since changed and local Authorities can only issue licences to developers after first having sight of the licence from EMA confirming that an approved EIA has been done or an exemption certificate has been issued. **In line with the requirements of this legislation, the proposed areas for distribution are well planned and not haphazard, therefore eliminating issues of involuntary resettlement arising from project activities interacting with the houses and other infrastructure.**

3.1.8 National Museums and Monuments Act (25:11)

The legislation provides for the preservation of ancient, historical and national monuments, relics and other objects or artifacts of historical or scientific value. Section 20(c) requires all commercial developers to carry out archaeological and paleontological impact assessments before any development takes place. Part IV of the Act, Section 21 provides for the notification of discovery of ancient monuments and relics to the National Museum and Monuments. In terms of Section 24, no person shall excavate any ancient monument, and in terms of Section 25, alter, damage or remove from its original site any national monument or relic without the consent of the Executive Director of National Museum and Monuments. **It is however important to note that the proposed project area has already been disturbed and no new findings are expected. This is also relevant to the 'Physical Cultural Resources' World Bank Environmental and Social Safeguard Policy.**

3.1.9 Road Traffic Act (13:11)

The legislation provides for the promulgation of regulations for the control of traffic movements, traffic noise, fumes, safety and the erection of traffic signs. This is particularly important during the construction phase of the subproject where a lot of material movement will be taking place.

3.1.10 Occupational Health and Safety in the Work Place in Zimbabwe

At a general level, occupational health and safety laws that are applicable to all employers and employees across sectors are the Labour Act, Chapter 28:01 and NSSA (Accident Prevention) (Workers Compensation Scheme) Notice No. 68 of 1990. There are also sectoral occupational health and safety laws. **In line with these regulations, ZINWA needs to ensure that together with its contractors, they provide a safe working environment for the employees. This is most applicable considering that the employees are exposed to risks such as falling from elevated work areas, drowning and injury from chemicals.**

3.2 World Bank Environmental and Social Safeguards Policies

The objective of the World Bank environmental and social safeguards is to prevent and mitigate undue harm to people and their environment in the development process. The ten thematic areas covered by World Bank environmental and social safeguards are;

- Environmental Assessment
- Natural Habitats
- Pest Management
- Involuntary Resettlement
- Indigenous Peoples
- Forests
- Physical Cultural Resources
- Safety of Dams
- Common Property Resources
- Conflicted Jurisdictions

The World Bank environmental and social safeguards whose applicability will be reviewed below are;

- O.P 4.01 - Environmental Assessment.
- OP 4.04 - Natural Habitats
- OP 4.36 – Forests
- OP 4.11 - Physical Cultural Resources
- OP 4.12 - Involuntary Resettlement

3.2.1 O.P 4.01 Environmental Assessment

The application of the Environmental Assessment safeguards policy aims to ensure the environmental and social soundness and sustainability of the planned water supply subprojects. This policy supports the integration of environmental and social aspects of the seven subprojects into the decision making process, including both the location/site and technology choices, which started with the ZINWA screening reporting. The Environmental Assessment has a two-pronged approach intended to satisfy both the national environmental legislation and the World Bank safeguard policies.

The project screening was conducted in accordance with the World Bank Environmental Assessment guidelines and was categorized in category B due to the limitedness of the potential environmental and social impacts. The subproject was further screened in accordance with the Environment Management Act (CAP 20:27) and a meeting with the Environmental Management Agency (EMA) and the project was exempt from the requirements of the full environmental and social impact assessment. With this two tie screening, the agreed safeguards tool for the project is the Environment and Social Management Plan (ESMP). The ESMP will be reviewed by both the World Bank and the local Environment Management Agency (EMA).

3.2.2 OP 4.04 Natural Habitats

This safeguard policy promotes environmentally sustainable development by supporting the protection, conservation, maintenance and rehabilitation of natural habitats and their functions. The impacts on natural habitats and biodiversity is extremely limited as the water supply projects will be in the form of refurbishment and equipment upgrade, largely taking place within the confines of existing and already converted land uses. Despite the limited scope of project activities, the O.P 4.04 Natural Habitat was triggered on precautionary basis considering that the raw water sources are a dam and the Mpudzi River which are a habitat for some aquatic species. The mitigation for the policy will be implemented along with the general mitigation measures in the ESMP that ensure that there is no water use conflict between the urban, rural and the aquatic environment itself.

3.2.3 OP 4.36 – Forests

Realization of the potential of forests to reduce poverty in a sustainable manner and the protection of vital local and international services and values of forests are key goals of this policy. The restriction of the water supply subprojects to existing sites and infrastructure means that there will be very limited direct degradation or conversion of critical forest areas or related critical natural habitats as already alluded to. There are no gazetted forests within the project area, therefore the policy is not triggered. However; efforts to minimize vegetation destruction will be implemented throughout the project.

3.2.4 OP 4.11 - Physical Cultural Resources

This policy seeks to preserve Physical Cultural Resources and avoiding their damage or destruction. Physical Cultural Resources include resources of archaeological, paleontological, historical, architectural, religious, burial and grave sites and aesthetic structures. Again, the fact that the projects are being implemented in converted land sites means that there will not be any issues of such physical cultural resources needing preservation. The policy is therefore not triggered.

3.2.5 O.P 4.37 Safety of Dams

The water treatment plant will be fed with raw water from the Mundi-Mataga Dam. The project therefore triggers the Safety of Dams O.P 4.37 because the success of the project is based on the integrity of the above dam. In line with this policy, ZINWA will submit dam inspection reports as a measure to ensure that the dam is kept in good working order.

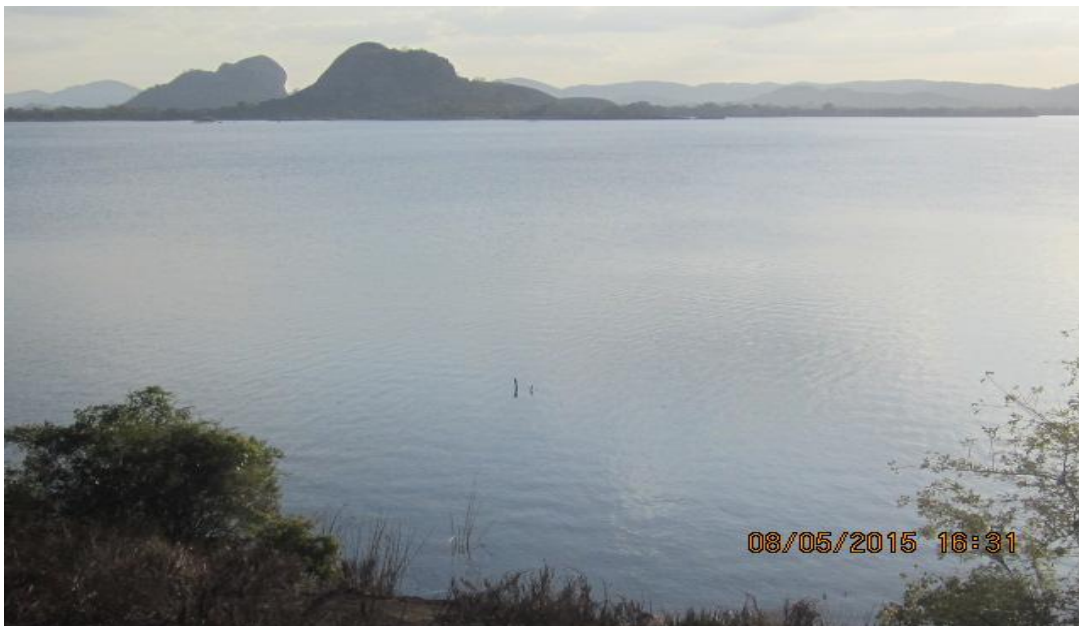


Fig 4.1 Mundi Mataga Dam

3.2.6 O.P 4.12 Involuntary Resettlement

Resettlement screening was conducted as part of the ESMP formulation and there are no chances of involuntary resettlement within this subproject. The project area is well planned and the anticipated distribution network is targeted to a well-planned area with no encroachments along road reserves or service lanes. The policy is therefore not triggered. Below are some of the project areas that show clear servitude areas and no encroachments on the road reserve.



Fig 4.2 Sparsely settled Mataga community targeted for distribution network

Chapter 4

Environment and Social Baseline

4.0 Environmental baseline

4.1.1 Geology

The geology in the vicinity of Mataga is dominated by a granite-gneiss terrain typical of the Northern Limpopo Marginal Zone. There are scattered and stretched ultramafic pods with chrome mineralization at Nyala and Rhonda. The Mwezha Greenstone Belt which is less than 10 km to the north of Mataga Growth Point is home to the Sandawana Emerald mine and the Buchwa Iron Mine. A number of other minor minerals include tantalite, tourmaline, topaz, corundum and beryl.

4.1.2 Topography

The Mataga area is characterized by rolling to flat topography with characteristic granitic/gneissic bornhardts and dwalas. Average altitude is between 900 and 950 meters above sea level. The manmade features such as roads and buildings where the existing pipeline is passing thorough will have minimum negative impact to the whole project. Find attached the 1:50000 topographical map.

4.1.3 Soils

The soils around the Mataga area which are derived from the granitic/gneissic terrain are typically greyish/brownish sandy loams of generally low cation exchange capacity and therefore with low fertility.

4.1.4 Ecology (Fauna and Flora)

The vegetation consists of predominant bushes of acacia and mopane species on low lying areas with Miombo woodland (*Brachystegia* species) on well drained hilly and mountainous areas. Grass species dominate low areas where there is no over grazing. The project area is already impacted by other earlier developments and hence the project itself has very low incremental impacts on vegetation.

As the Natural Habitat Safeguard OP4:04 has been triggered, an assessment of the impact of the project on habitat and species will be included. This involve an assessment of the natural fish species that can be affected by the increased water abstraction and the downstream aquatic ecology through Biomonitoring.

4.1.5 Climate

Mataga lies within agro-ecological region V which is classified as semi-arid to arid, with low annual rainfall averaging less than 450 mm per annum. The typically tropical seasons are divided into winter and summer with winter temperatures ranging between 15 and 20 degrees Celsius and summer temperatures ranging between 20 and 32 degrees Celsius.

4.1.6 Water quality and Air Quality

Water quality describes the physical, chemical and biological characteristics of water. The surface water quality is highly affected by man-made activities such as induced agriculture and mining siltation. However, the largest contributor to surface water quality is open defecation practices at the Growth Point and improperly disposed of hospital wastes (Musume Hospital), which result in the pollution of surface water in the Mundi River and its tributaries. ZINWA is responsible for the water quality monitoring through its Quality Assurance department. This exercise is done on a monthly basis due the population numbers that consuming water in Mataga. The exercise consist of taking samples from the treatment plant up to consumer point and analyzing the chemical and bacteriological nature of the water supplied. The water quality must be able to meet the SAZ and WHO drinking water quality standards.

The raw water source for this supply station is the Mundi Mataga dam as well as the much smaller Gwava-mutangwi dam. The two dams have more than adequate amounts of water of acceptable quality. There is bound to be an increase in the amount of energy required for pumping after project implementation. The number of consumers is also set to increase sympathetically as more water becomes available.

The air quality of the area during the project implementation phase will be slightly be affected due to trenching of the pipeline. These impacts occur within converted/already built-up areas and can be adequately mitigated or in some cases removed through the use of appropriate technology, preventive maintenance and the diligent and prudent application of Safety, Health and Environment (SHE) practices.

4.1.7 Raw Water Source Capacity Status

The Mundi Mataga dam has a 10% yield of **17 000ML**. The maximum extraction for irrigation is planned at between **5 - 6000ML** and is currently working at less than 2000ML. Therefore the dam as a raw water source is adequate for both the existing demand and any foreseeable future expansion.

The capacity of the dam at Gwava-Mutangwi is not known although it is a relatively small dam. According to the operation chart records the supply cannot support Mataga during the months of September to December as the water level drops significantly and it struggles to supply its own area. Therefore this source of raw water cannot be considered as sufficient to meet the current needs of the town.

4.1.8 Current effluent disposal system

The current source of effluent is from the backwash water containing salts such as aluminum, Iron or sulphate ions. The current disposal way is by discharging into the environment. Although the environment has a self-purifying capacity, increased loadings can affect the aquatic environment. The current classification of discharge accorded by EMA is red. The rehabilitation work will therefore mitigate against the pollution loadings.

4.2 Socio-Economics

4.2.1 Administrative Arrangements

Mataga growth point falls under Mberengwa district administrative boundary in Midlands's province. The district is headed by a District Administrator, appointed by the Public Service Commission. There is also Mberengwa Rural District Council, which appoints a Chief Executive Officer and plays the role of project monitoring and evaluation. The Rural District Council comprises elected ward councilors. Other government functions at district level are carried out by district offices of national government departments such as Ministry of Health and Child Welfare.

The project area also falls in Mwenezi sub catchment council boundary. The role of this council is to manage water resources through stakeholder participation at lowest appropriate level.

4.2.2 Livelihoods

Major livelihoods strategies and occupations in the growth center are small General Dealer (hardware and grocery shops) and its work force as well as government employees (mainly police, teachers and nurses. The rest of the workforce comprises of local authorities (RDC) and service parastatals such as ZINWA, Agritex, GMB, TelOne, ZESA, Delta and others. There are a few light industries (welding and carpentry) and commercial enterprises such as Agribank. The bulk of the population is involved with vending of a variety of goods and wares ranging from fruits and vegetables, grain, clothing and hardware largely in open markets. Average income for the center is around \$80-100 per month though the sizable civil servants population earns more.

4.2.3 Population and demographics

The Growth Point's population is estimated at over 4 000. The center also services Musume Hospital, a big Lutheran Mission district referral health service center with over 250 beds and 48 staff houses. The project is aimed at catalyzing the connection of water to approximately 1 000 residents in addition to boosting the delivery of water to existing connected residents numbering about 3 000, and unspecified rural villages along the Mataga-Musume treated mains, houses and shops at Musume Primary and Secondary Schools as well as Musume

Business Centre. As part of the Growth Point, there is 1 Secondary School and 2 Primary Schools as well as a Clinic. Establishments at the center are given in table below.

Table 5: Establishments at Mataga

| Zone | Completed Structures | Partially Developed | Vacant/ Undeveloped | Total |
|--------------------------|-----------------------------|----------------------------|----------------------------|--------------|
| Commercial | 138 | 15 | 0 | 143 |
| Service industry | 47 | 15 | 5 | 67 |
| Heavy and Light Industry | 80 | 19 | 6 | 105 |
| Residential high | 5 | 3 | 722 | 730 |
| Residential Low (new) | 27 | 21 | 196 | 244 |
| Res Medium (old) | 219 | 11 | 22 | 252 |
| Sports center | 0 | 0 | 1 | 1 |
| Churches | 4 | 2 | 5 | 11 |
| Corner shops | 0 | 0 | 2 | 2 |
| Primary Schools | 0 | 0 | 2 | 2 |
| Secondary Schools | 1 | 0 | 0 | 1 |
| Training Centers | 0 | 3 | 0 | 3 |
| Crèches | 0 | 1 | 2 | 3 |
| Government Complex | 0 | 0 | 1 | 1 |
| Clinics | 1 | 0 | 0 | 1 |
| Tel One | 1 | 0 | 0 | 1 |
| Zim Post | 1 | 0 | 0 | 1 |
| DDF | 1 | 0 | 0 | 1 |
| Veterinary Service | 1 | 0 | 0 | 1 |
| GMB | 1 | 0 | 0 | 1 |
| | | | | 1566 |

4.2.3 Gender mainstreaming

Due to erratic supply of the current water status, women play a major role in fetching water at household level. This is due the traditional accepted roles of gender. At Mataga growth point there are currenttwo functional boreholes that augment the erratic clear water supplies. The woman and girl child are usually used to fetch water at these boreholes. The population of women in ward 18 is **4360** and **3575** for males according to the latest census.

4.2.4 Land uses

The land use is typically peasant mixed farming, cropping and animal husbandry. The crops grown are largely drought resistant small grain (millet and sorghum) and maize, while each household will keep small numbers of cattle, goats, sheep and commonly donkeys. All the land where the tank and proposed new treatment plant are located within ZINWA property. The pipeline and reticulation is under Mberengwa RDC s control. The project area will not interfere as it passes through an existing well planned housing area.

4.2.5 Sanitation Facilities

The Growth Point has predominantly individual septic tanks facilities and few Blair toilets. The current inadequacy of the water supply make open defecation a common practice at Mataga, with serious negative water quality issues for downstream communities. After project implementation, it will become necessary for the center to have a dedicated sewage treatment facility. This will in turn have negative consequences of increased malaria due to the new breeding grounds for mosquitoes as well as increased volumes of waste water needing more energy and water treatment chemicals.

4.2.6 Public Health

Bilharzia, diarrhoea and malaria are now common and prevalent diseases in Mataga area due to poor water and sanitation. Although, the Ministry of Health through the local clinic at the growth point has in the past vaccinated school children against diarrhoea. The breeding ground for these diseases is the Mundi River which is polluted by open defecation, dirt from washing and pampers thrown into the river. The residents of Mataga use the water from the river during erratic supply periods. Below is the pictures of some of the points along Mundi River where residents in Mataga and surrounding villages abstract water for domestic purposes:



4.2.7 Occupational health status

All staff have safety boots and overalls. All facilities visited were clean and tidy. A First aid kit with adequate contents is in place for use by workers in case of minor injuries. No occupational health and safety trainings have been done so far this year. However, at project implementation

stage there will be increased occupational hazards such as working on raised platforms, handling of chemicals, handling dust and digging with sharp implements. This can be mitigated by purchasing the necessary personal protective equipment to all workers during the whole project cycle.

Chapter 5

Stakeholder consultation

5.1 Introduction

A stakeholder refers to any person or group who can be affected, is affected by or think that they are affected by or is affected by the results and or actions taken as a result of a developmental process. Environment Management Act (CAP 20:27), section 4 (2c) says that participation of all interested and affected parties in environmental governance must be promoted and all people must be given an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation. As a result ZINWA engaged on a process where these stakeholders participated in the ESMP process by providing needed information which they think will protect them and the host environment and communities. The above process was carried out as a way of ensuring compatibility of the project with other developmental projects already in existence.

5.2 Objectives of the stakeholder consultation

The stakeholder process aimed at achieving the following objectives;

1. To inform the stakeholders about the proposed project.
2. To identify potential negative and positive environmental impacts associated with the proposed project.
3. To increase public confidence and enhance a sense of ownership in the operational phase of the project.
4. To ensure the negative impacts are mitigated and benefits are maximized.

5.3 Principles governing consultations

In the spirit of the Environment Management Act, the following principles were consistently upheld in all the consultancy work;

5.3.1 Inclusivity

The public consultation process covered representation of all relevant stakeholders. To ensure this principle was upheld, the stakeholder list was rationalized by the EMA through the prospectus review.

5.3.2 Open and transparent

In order to enhance this principle, the consultant ensured that all steps and activities of public consultation were understood by all consulted stakeholders.

5.3.3 Relevant

Relevance was also key in this ESMP and was achieved through remaining focused on the project issues that matter. The consultation boundaries also ensured that the consultation process remains relevant to the proposed activities.

5.3.4 Fairness and responsiveness

To achieve the objectives of the stakeholder consultation process there was a need to ensure that the consultation was conducted impartially. All stakeholders were empowered with project information first, and then solicit their informed input.

5.4 Data Collection Techniques

It is also important to note that there is no one best method of data collection hence a number of these methods were employed in the process. The following stakeholder consultation methods were used

- Questionnaire was administered to government departments. See attached filled forms
- A public notice was placed in strategic areas of Mataga community for distant stakeholders who do not necessarily reside in the project areas but are interested or affected by the project. See the Public Notice in the Appendix.
- Public meetings were held for local communities. See attached minutes

With this diversity of consultation process undertaken ZINWA is very much confident that all potential stakeholders were reached and their views were correctly captured.

5.5 Stakeholder list

The following stakeholders were listed for consultation

- i. District Administrator(Due to location, away from Mataga center was unable to be contacted)
- ii. Department of Irrigation.
- iii. Ministry of Health and Child Welfare.
- iv. Ministry of Education.
- v. RDC
- vi. Residents Association
- vii. Sub catchment council.
- viii. Local business community
- ix. Local NGO community

5.6 Summary of stakeholder in puts

5.6.1 Government Departments

| Name of stakeholder | Stakeholder concern/ in put | Stakeholder recommendation | Response/Action |
|---|---|---|---|
| 1. RDC Planning and Works | Inadequate and erratic water supply | Will ZINWA be able to supply water adequately | This will be mitigated through quick rehabilitation |
| 2. Department of Irrigation | Will water from the dam be adequate for farmers in view of the project How safe is the dam? | Adequate supply of water from Mundi Mataga dam Zinwa to conduct periodic dam safety exercise and appraise the farmers | Agreement contract with ZINWA and farmers Dam safety inspection by ZINWA Engineers |
| 3. Mataga Rural Health Center. | Raised concern of open defecation due to limited supply of water in Mataga Raised concern of increased water borne diseases such as diarrhea and bilharzia | ZINWA to supply water on consistently and cover all areas of Mataga ZINWA must supply water adequately to avoid community fetching water from Mundi river. | This will be done through quick rehabilitation and also through water quality monitoring on a monthly basis |
| 4. Ministry of Education) Zvishava Primary School | Concerned by scarcity and erratic supply of water by ZINWA | ZINWA to supply water throughout the year to enhance education process | This will be mitigated through quick rehabilitation |

5.6.2 Local Community Leaders

Stakeholder Consultation Meetings

Stakeholders consulted for this project included having a meeting with RDC Acting Chief Executive Officer and his team and public stakeholder meetings with resident, business associations and Irrigation Water Committee.

5.6.2.1 RDC Responses

The RDC, through the Acting CEO and key department staff of Engineering, Planning and Social Services provided crucial insights into the current water challenges and future plans for the growth point. The meeting agenda followed the format as indicated below through the minutes:

i) Gender Main Streaming

The RDC highlighted the fact that once there are breakdowns or erratic supply, women in the centre as their traditional role demands fetch water for the household at the two functional boreholes and Mundi River. The great concern is the water quality abstracted along the river due to open defecation and pollution from washings of clothes and vehicles. The same water is used for drinking, cooking and bathing at prior any disinfection process leaving the Mataga community at risk to water borne disease such as diarrhea and bilharzia. Below are some of the pictures where residents abstract water from Mundi River:



ii) Contractor Employment Issues

The RDC indicated that the contractor employs especially unskilled labour from the local community during the project implementation phase. Also, the RDC has affordable lodgings to accommodate migrant workers at affordable rates.

iii) Quantity and Quality of Water

The quantity of water supplied according to RDC is inadequate and very erratic. At times can received water just for a week or so throughout the month. However, the dam capacity will remain adequate for the increased abstractions envisaged after project completion.

The RDC highlighted that the quality of water is rather satisfactory, although during rainy season and after pipe burst repairs the water supplied is usually muddy and turbid. Also at times smelly water is received.

iv) Water services and Payments

The RDC welcomed the project as it brings capacity to meet demand for future housing development project in Mataga. The council assured the house that residents of Mataga have a no problems in paying for the envisioned upsurge of water bills due to perceived consumption after the project completion.

v) Relocation

The RDC was assured that no relocations will take place as the project is implemented in already used infrastructure sites.

vi) Citizen Engagement

The RDC indicated that they play the role of a mouth piece and focal point for the residents in Mataga.

Below is the picture of meeting held between ZINWA and RDC officials:



5.6.2.2 Musume High and Primary Schools

Interviews were conducted through questioners with the two school heads. They indicated that their schools were facing serious challenges as a result of the water challenges. These included the following:

- Raw water source(dam) dries up between September and November each year
- Erratic supply
- Hygiene especially open defecation near the Mundi river

The heads indicated that an improvement of the water supply to the school would have the following positive impacts;

- Improved staff retention. Turnover of staff would not be as high as it is now.
- Improved health and hygiene for both pupils and staff.
- Children would not have to consume contaminated water whilst teachers would have adequate water for their household chores
- Improved education environment

5.6.2.3 Musume Mission Hospital Responses

A consultation questionnaire was sent to the largest referral health center in the Mberengwa district and they raised the issue of erratic water supply which has a negative impact to their operations. This puts lives of patients and staff at great risk.

5.6.2.4 Irrigation Committee Responses

Interviews were also held with some members of the Biri Extension Irrigation committee during the consultation meeting. This stakeholder group had the largest population of woman representation to this meeting.

The guide which was used for the interviews as per the minutes attached:

i. Water Availability

The committee raised up a concern on water availability to the irrigation needs in view of the increased uptake of water from the dam after the completion of the project. ZINWA assured the committee of availability of water as currently the dam is underutilized.

Below are some of the pictures of the people who attended:



5.6.2.5 Resident and Business Associations Responses

Residents were interviewed using the guide as indicated in the attached minutes.

i. Water Availability

The associations indicated that water is generally available during night time. Residents indicated that 90% of times water is available at least for two weeks in a month. The few hours that water is not available were associated with frequent pipe bursts.

ii. Gender Main Streaming

The associations indicated that if the project succeeds, the livelihood of the woman and girl-child will be improved greatly. The improvement will be terms of increased time available to do other productive chores and education empowerment instead of fetching water. Equally so the girl is affected in education progress as she spends time fetching water.

iii. Quality of Water

The associations raised a great concern of the quality of water citing the bitterness and muddiness of water received especially during the rainy season and after a pipe burst repairs.

iv. Water cost and payment

The association's response on water payment was very positive. However, they highlighted the issue of awareness campaign to be done and accurate billing on the part of ZINWA.

v. Relocation

The associations were assured that the project implementation phase will not affect or relocate people as it is done on the already existing works.

vi. Local Employment Issues

The associations raised the issue that local (skilled or unskilled) labour get the first preference in terms of project employment. The assurance was given that local labour will get the first preference indeed.

vii. Citizen Engagement

The locals present at the meeting well-articulated the different roles played by the local councilors, resident and business associations in citizen engagement.

viii. Procurement and Project duration

The association's requested to know the procurement procedures as they wanted that the local companies benefit. The residents were assured that the State Procurement Board and World Bank procurement procedures are non-discriminatory and will be applied during the whole project duration.

The pictures below show the participation of associations in the consultation meeting.





5.6.2.6 Local NGOs

The local NGO highlighted also the negative impacts of the erratic water supplies in the Mataga center through a questionnaire. They indicated the low environmental concerns of the project implementation.

5.6.2.7 Mwenezi Sub catchment Council

Mwenezi sub catchment council also raised the issue of inadequate water supply situation currently experienced by the growth point. They welcomed the project as the only solution that can alleviate water shortages in the area. Find attached the questionnaire.

Chapter 6

Impact Analysis and Evaluations

6.1 Introduction

The main objective of this ESMP is to promote sustainable development by ensuring that the water supply project does not undermine critical resource and ecological functions or the well-being, lifestyle and livelihood of the communities and peoples who depend on them. As a decision making tool, the assessment sought to inform the decision making process by identifying the potentially significant environmental effects and risks of the proposed project activities, assessing them, evaluating the possibility of alternatives and proposing the mitigation measures of any significant negative impacts through an environmental management plan.

Only those elements of the environment that have a direct bearing on the impact assessment process of the project are discussed. The severity of the potential impacts is largely determined by the state of the receiving environment. For example, the construction of a water pipeline in a pristine wetland habitat would have far more significant ecological impacts than the construction of the same in an already built up residential area.

6.2 General Approach

Table 3.1 was used principally during impact identification and analysis. The type/status (positive, negative, neutral), magnitude/Significance, timing (during design / planning, construction, and operation), duration (short term/temporary, medium, long term/permanent), extend/spatial scale (low, medium, high), mitigatory potential (low, medium, high), acceptability (low, medium, high) and degree of certainty (definite, probable, possible & unsure), of impacts that could result from the water supply were assessed in this section. The evaluation approach implemented in this study is a Receptor-Specific Analysis approach addressing the various sources of impacts from the development project.

The analysis covers all potential fields of impacts and/ potential receptors:

- Ambient Air Quality
- Water resources
- Soil

- Biodiversity
- Noise
- Dust
- Waste generation
- Socio-economic Impacts
- Occupational health and safety

The general evaluation process included the following stages:

Step 1: Identification of project activities (sources) and environmental aspects;

Step 2: Identification of potential impacts to people and the environment;

Step 3: Evaluation and assessment of the related unmitigated impact significance;

Step 4: Identification of Best Practicable Environmental Options

Step 5: Re-evaluation and assessment of the mitigated impact significance

Table 3.1: Criteria Used For Assessment of Impacts

| Assessment Criteria | Rating | Interpretation of rating |
|----------------------------------|-------------------|---|
| Types/Status | Negative | Process detrimental/adverse to environment |
| | Positive | Process beneficial to environment |
| | Neutral | Process neither beneficial nor detrimental |
| Magnitude or significance | High(Red) | Of the highest order possible within the bounds of impacts that could occur. In the case of adverse impact there is no feasible mitigation that could offset the impact, or mitigation is difficult, expensive or a combination of these. Social, cultural and economic activities of communities are disrupted to such an extent that these come to a halt. In the case of beneficial impacts, the impact is of substantial order within the bounds of impacts that could occur. |
| | Moderate (yellow) | Impact is real, but not substantial in relation to other impacts that might take effect within the bounds of impacts that could occur. In the case of adverse impact mitigation is feasible and fairly easily achievable. Social, cultural and economic activities of communities are changed but can be continued (albeit in a different form). Modification of the process design or alternative action may be required. In the case of beneficial impacts, other means of achieving this benefit are equal in time, cost and effort. |
| | Low (Green) | Impact is of low order and therefore not likely to have real effect. In the case of adverse impact mitigation is easily achievable, or little will be required. Social, cultural and economic activities of communities can continue unchanged. In the case of beneficial impacts, alternative means of achieving this benefit are likely to be easier, cheaper, more effective and less time consuming. |
| Extent or | High | Widespread, far beyond site boundary, |

| Assessment Criteria | Rating | Interpretation of rating |
|-----------------------------|---------------|---|
| spatial scale | | Regional/National/ International Scale |
| | Medium | Beyond site boundary, local area |
| | Low | Within site boundary |
| Duration | Long | Permanent, beyond decommissioning |
| | Medium | Reversible over time, lasts for lifespan of project |
| | Short | Quickly reversible, less than lifespan of project |
| Mitigatory potential | High | High potential to mitigate impacts to the level of insignificant effect |
| | Medium | Potential to mitigate negative impacts. However, the implementation of mitigation measures may still not prevent negative impacts |
| | Low | Little or no measures to mitigate negative impacts |
| Acceptability | High | Unacceptable. Abandon project/process in part or in its entirety |
| | Medium | Acceptable with regulatory controls and with proponent's commitments |
| | Low | Acceptable, no risk to public health |
| Degree of certainty | Definite | More than 90% sure of a particular fact or the likelihood of an impact occurring |
| | Probable | Over 70% sure of a particular fact or the likelihood of an impact occurring |
| | Possible | Only over 40% sure of a particular fact or the likelihood of an impact occurring |
| | Unsure | Less than 40% sure of a particular fact or the likelihood of an impact occurring |

Main Impacts and Mitigation for Mataga

The impacts for Mataga were analysed using the criteria outlined in above. The activities for Mataga will largely be carried out at the new water treatment plant at Mundi Dam. These are meant to complete the treatment plant and make it functional and include installation of valves, equipment, roofing, pipeline to connect treatment works and small construction works to complete the plant. The other main component will be reticulation for new connections in the residential areas and commercial center. This will involve digging and trenching.

1.Planning Phase

Some activities for the projects have already taken place. The construction of the main water treatment plants at Mataga is almost complete and hence some of the impacts under this phase have already been felt. Mataga water treatment works construction is about 75% complete. The planning phase impacts for the reticulation for the houses and other institutions which have not yet been connected are limited to trenching, which however happens in dedicated and environmentally converted land-use. The planning phase normally involves the cutting of trace lines for surveys and pegging. Impacts normally result from cutting down vegetation, disturbance to soils and dragging of equipment on the ground.

2. Biophysical

Vegetation

This impact has already been felt in most cases. This is because most of the project area is already built up. It is only in the areas where pipe rehabilitation or construction where careful planning is required as there may be a bit of secondary vegetation. Even the site for the clear water storage tank in Mataga has been cleared of vegetation and the site is almost ready for construction activities. The other areas for reticulation are devoid of vegetation as these are in the built up residential, commercial, industrial or institutional spaces.

Minimal impact is expected on the aquatic habitat of the lake. However, continuous monitoring of the releases from the dam and through abstraction for treatment processes has to be metered to ensure habitat stability.

Assessment for vegetation impacts during planning phase

| Assessment Criteria | Rating |
|----------------------------|---------------|
| Type/status | Negative |
| Extent or spatial scale | Low |

| | |
|--------------------------------|----------|
| Duration | Short |
| Mitigatory potential | High |
| Acceptability | Low |
| Degree of certainty | Probable |
| Significance before mitigation | Low |
| Significance after mitigation | Low |

This is judged to be an impact of low significance because in 90% of cases there is no vegetation as the areas have been built up.

Mitigation

Avoid disturbing or cutting trees in areas where there is still some vegetation. Trace lines for surveys and pegging will only utilize restricted areas and this is not likely a significant impact.

Wildlife

There are no wild animals in Mataga because of both the dry climate and the surrounding rural settlements. Most of the planning activities have already taken place. Bream Species, Bottle Nose and Barble are the main fish species found in the dam. However, no rare species have been reported.

Assessment for impacts on wildlife during planning phase

| Assessment Criteria | Rating |
|--------------------------------|---------------------|
| Type/status | Negative |
| Extent or spatial scale | Low |
| Duration | Short |
| Mitigatory potential | High |
| Acceptability | Low |
| Degree of certainty | Probable for Mataga |
| Significance before mitigation | Low |

| | |
|-------------------------------|-----|
| Significance after mitigation | Low |
|-------------------------------|-----|

This is an impact of low significance because of the low existence of wildlife and short duration of activities.

3. Soil impacts

Movement and dragging of equipment on the ground during the time of survey and pegging of lines to be excavated for the pipes to be buried can result in loosening of soil which can potentially result in soil erosion or the generation of dust. However, this is not deemed a significant impact as the pegging and surveying activities are very low key.

Assessment for soils during planning phase

| Assessment Criteria | Rating |
|--------------------------------|----------|
| Type/status | Negative |
| Extent or spatial scale | Low |
| Duration | Short |
| Mitigatory potential | High |
| Acceptability | Low |
| Degree of certainty | Probable |
| Significance before mitigation | Low |
| Significance after mitigation | Low |

This is an impact of low significance due to short duration and much localized nature of activities.

The best mitigation measure would be to avoid dragging equipment on the ground and to ensure that there is no loose soil that can be blown away by wind or is washed away by water.

4. Hydrological and fluvial impacts

The effects of sheet erosion on loose soil if left unattended could trigger a host of negative impacts on water quality, levels and the capacity of water bodies. The negative impacts will accrue from siltation as valuable topsoil finds its way into streams.

Assessment for hydrological impacts during planning phase

| Assessment Criteria | Rating |
|--------------------------------|----------|
| Type/status | Negative |
| Extent or spatial scale | Low |
| Duration | Short |
| Mitigatory potential | High |
| Acceptability | Low |
| Degree of certainty | Probable |
| Significance before mitigation | Low |
| Significance after mitigation | Low |

The impact is of low significance.

The best mitigation measures here would be the one described above for soil.

Construction Phase

This phase will involve the completion of the water treatment works in Mataga, trenching and laying of water reticulation pipes to residential, industrial and institutional users, and the general upgrading and rehabilitation of water pipes and storage tanks.

Soil Disturbance

The trenching for the laying of the water reticulation pipes and the rehabilitation of the existing main pipeline to the water tanks will result in the disturbance of the soil. Trenches will be dug to lay pipes whilst the rehabilitation works will require trenching to lay bigger pipes. This is a temporary impact which will only be felt during the time of digging and laying of pipes.

Assessment for soil disturbance during construction phase

| Assessment Criteria | Rating |
|-------------------------|----------|
| Type/status | Negative |
| Extent or spatial scale | Low |
| Duration | Short |

| | |
|--------------------------------|----------|
| Mitigatory potential | High |
| Acceptability | Medium |
| Degree of certainty | Definite |
| Significance before mitigation | Moderate |
| Significance after mitigation | Low |

This impact will definitely occur during trenching and other earth works but its duration is limited to the construction phase only and can be attended to immediately. The spatial scale is very limited and the impact can easily be mitigated.

The soil will be used to cover the pipes once the laying process has been completed. It is recommended that this is done immediately to avoid having mounds of soils lying around.

Dust

A bit of dust will be generated during the trenching and covering up of pipes. This will be a temporary impact which will last during the trenching and covering up of pipes. It is recommended that wherever possible loose soils are sprinkled with water to avoid the creation of dust. In any case the trenches will be shallow; at most they will be about 0.5m deep.

This means that the pipes will have to be laid at least 0.75-1m deep. The disturbed soil during excavation can easily be washed away by water if left unattended for long periods.

Assessment for dust generation during construction phase

| Assessment Criteria | Rating |
|--------------------------------|---------------|
| Type/status | Negative |
| Extent or spatial scale | Low |
| Duration | Short |
| Mitigatory potential | High |
| Acceptability | Medium |
| Degree of certainty | Definite |
| Significance before mitigation | Moderate |

| | |
|-------------------------------|-----|
| Significance after mitigation | Low |
|-------------------------------|-----|

This is similar to the above impact on soil disturbance.

It is therefore recommended that pipes be covered as quickly as possible to avoid the soil being washed away. Back filling of the pipes should take place within a day or two to reduce dust from the loose soils from the trenches. This will also forestall dust generation from soil piles left unattended for long periods.

Disturbance of Forests and Biodiversity

The areas to be connected have already been transformed into built up areas. There is very little vegetation and wildlife. As a result, the impact of the project on vegetation and wildlife will be very limited to nothing. The construction site for storage tanks has already been cleared of a few teak trees. The construction of the Mataga water treatment plant, water mains and storage tanks will therefore not cause any direct disturbance of the local vegetation. Since the reservoir site has been established, increased human activity around the resevior will impact on the local vegetation especially during the construction phase.

Assessment for biodiversity during construction phase

| Assessment Criteria | Rating |
|--------------------------------|---------------------|
| Type/status | Negative |
| Extent or spatial scale | Low |
| Duration | Short |
| Mitigatory potential | High |
| Acceptability | Medium |
| Degree of certainty | Probable for Mataga |
| Significance before mitigation | Low |
| Significance after mitigation | Low |

5.Operation Phase

Biophysical impacts of the operation phase are very limited. These include possible contamination from back washing of filters. Increased volumes of raw water passing through the filter will entail more frequent backwashing and scouring to flush out rapidly accumulating debris and particles and regain the filter head pressure loss. Backwash water is very dirty and there is always a need to have a dedicated backwash line, complete with backflow prevention (Zane, 2005). This is either linked to a sewer main or a series of settling ponds, from which the overflow portion can be decanted into a nearby river while the dirt collects at the bottom. Backwash can also be recycled where water scarcity demands it. When the settling ponds are full, they can be covered up with soil and re-vegetated/reclaimed. At Mataga the backwash water will first pass through the ponds and recycled back into the system. Backwash water can pose serious water pollution negative threat as it contains transitional salts during the operational phase which can be mitigated by treating using a settleable pond system.

Other generic biophysical impacts will result from knock-on effects of increased water abstraction, increased wastewater production, increased numbers of residents and private vehicles. Increased water abstraction from the raw water sources (Mundi Mataga dam and Gwava -Mutangwi dam) may result in interference with some aquatic habitats, reduced water supply to some downstream wetlands and water pools with effects on habitats and biodiversity. Increased wastewater production is a natural consequence of improved water supply and this will strain the sewer treatment plants for the subprojects with common sewer line bursts resulting in malodorous releases and vector-borne transfers. Increasing resident populations come with increased solid waste generation and vehicular exhaust and noise pollution.

Uncontrolled and unmetered abstraction and releases of water from the dam may affect the natural habitat of the dam.

Assessment for impacts during construction phase

| Assessment Criteria | Rating |
|----------------------------|---------------|
| Type/status | Negative |
| Extent or spatial scale | Low |
| Duration | Long |
| Mitigatory potential | High |
| Acceptability | Medium |
| Degree of certainty | Definite |

| | |
|--------------------------------|----------|
| Significance before mitigation | Moderate |
| Significance after mitigation | Low |

6. Social Impacts

Planning Phase

The activities for Mataga are basically taking place in environments which have already been converted. Some impacts have already been felt. The planning of the pipeline route from Mundi Dam to the treatment works has already been done. There will be very little planning in the residential areas and commercial centre as the routing has been determined by the layouts. It is anticipated that at most one or two people or unskilled hands will be employed to assist with the finalization of the surveying and pegging of the pipeline routes in the residential and commercial areas. This is a low significant positive impact because of the numbers involved which are low and the short duration of the activities.

Assessment for job creation during planning phase

| Assessment Criteria | Rating |
|--------------------------------|----------|
| Type/status | Positive |
| Extent or spatial scale | Low |
| Duration | Short |
| Mitigatory potential | High |
| Acceptability | Low |
| Degree of certainty | Definite |
| Significance before mitigation | Low |
| Significance after mitigation | Low |

7. Construction Phase

The construction phase will have some impacts which may well last into the operation phase. There both positive and negative impacts.

Negative Impacts

Health and Promiscuity

The negative impacts arising from these activities are of low to moderate significance. Some will last well into the operation phase while others are permanent. Among the principal ones are:

- Increase in prostitution, promiscuity and immorality as gangs of moneyed male workers seek ‘entertainment’ and enjoyment.
- Breakup of the social fabric caused by local males who are led astray by increased incomes and engage in adultery or bouts of drunkenness, or local females who fall for the ‘moneyed’ local or outside males working on the factory site.
- Increase in Sexually Transmitted Diseases including HIV/AIDS due to increased prostitution and promiscuity.

Assessment for promiscuity, health during construction phase

| Assessment Criteria | Rating |
|--------------------------------|---------------|
| Type/status | Negative |
| Extent or spatial scale | Low |
| Duration | Short |
| Mitigatory potential | High |
| Acceptability | High |
| Degree of certainty | Probable |
| Significance before mitigation | Moderate |
| Significance after mitigation | Low |

This is a low significant impact because of the duration and spatial extend.

MITIGATION

It is recommended that education, counselling and a penal code will address the health and moral problems. Education on HIV/AIDS as well as a proactive preventive approach like that used by community health workers will reduce the unfettered spread of STDs, including HIV/AIDS. Making all workers contract workers for a set period will make it easy to get rid of undesirable elements in the workforce. Recruiting locals can also help as they will be embarrassed to engage in immoral acts in the eyes of friends and relatives.

Safety

This is similar to the other centres. Worker safety is guaranteed under the laws of Zimbabwe. Those employed during the construction period should be protected from injury. There is potential for employees to be injured as they dig trenches or work on water pipes. They can injure their hands, eyes or other parts of their bodies.

On the other hand, trenches left uncovered can result in injuries to residents. Children can be vulnerable as they see mounds of loose soil as a potential source of entertainment to play with.

Assessment for safety during construction phase

| Assessment Criteria | Rating |
|--------------------------------|----------|
| Type/status | Negative |
| Extent or spatial scale | Low |
| Duration | Short |
| Mitigatory potential | High |
| Acceptability | High |
| Degree of certainty | Probable |
| Significance before mitigation | Moderate |
| Significance after mitigation | Low |

This is a low to moderate significance impact because of the low numbers of people involved and the probability of accidents happening from the low key activities.

Mitigation

The contractor will produce a SHE work plan for the site, prior to operation, Workers should be given adequate protective clothing as per the laws of the land. This will depend on which department they will be working under. They will need overalls, heavy duty boots and noise protection kits if they are working in noisy work place. Every employee on induction will be trained on safety issues to adhere to. No one will be allowed to log in for work without proper protective clothing for respective duties and area of work. Punishments for not adhering to the safety rules must be set and followed while safety awards can also be given to the most disciplined in terms of safety adherence as a way of ensuring safety culture on site.

For the residents, it has already been highlighted that the soils will need to be backfilled as quickly as possible. Trenches should be fenced during the construction period and infilled as quickly as possible. Any open trenches that are left open should be barricaded using reflective safety tape. This will forestall the possibility of injuries resulting from people falling into the trenches or injuries to children playing on soil mounds.

Waste Generation

Solid waste in the form of off-cuts of pipes and wrapping materials will be produced and will need to be disposed off. The logic of labour efficiency will dictate that while they are at work they will opt to dispose of this waste as near to the workstation as possible. Left uncontrolled, this phenomenon will result in litter and excrement dotted all over the proposed development site.

Assessment for waste during construction phase

| Assessment Criteria | Rating |
|--------------------------------|---------------|
| Type/status | Negative |
| Extent or spatial scale | Low |
| Duration | Short |
| Mitigatory potential | High |
| Acceptability | High |
| Degree of certainty | Probable |
| Significance before mitigation | Moderate |
| Significance after mitigation | Low |

This is an impact of moderate significance on account of the unacceptability of the impact. However, the impact can be easily mitigated.

Mitigation

It is recommended that for papers, food leftovers and similar rubbish we propose a well-organise garbage collection and disposal system. This will need the provision of bins, the raising of awareness on indiscriminate dumping by the workforce, and the careful disposal of the rubbish out of site and in a safe place that will not be accessed by scavengers.

For human waste we propose the provision of temporary ventilated pit latrines. These should be set up in such a way that they are spaced across the work area, away from water sources and sacred sites. After the part of the work is done, they can easily be collapsed and covered over gain in a way that will not make it easy for scavengers to access the sites.

Traffic

Movement of construction vehicles bringing in pipes and other supplies has the potential to increase traffic conflict with local traffic and also cause accidents with domesticated animals. Whilst this impact is temporary as it will be felt largely during the construction phase, it is potentially significant as it may result in fatalities through accidents. However, construction vehicles will move outside the project area only when they are bringing in supplies and this will limit the conflict with outside traffic to those times only. Traffic will also increase dust in the area.

Assessment for traffic during construction phase

| Assessment Criteria | Rating |
|----------------------------|---------------|
| Type/status | Negative |
| Extent or spatial scale | Low |
| Duration | Short |
| Mitigatory potential | High |
| Acceptability | High |
| Degree of certainty | Probable |
| Significance before | Low |

| | |
|-------------------------------|-----|
| mitigation | |
| Significance after mitigation | Low |

This is an impact of low significance as the vehicles are expected once in a while hence the limited duration of the impact.

Vehicles bringing in supplies to the project site should not travel at more than 40 kilometres per hour. This will not only ensure that traffic accidents are kept to a minimum, but will also limit the amount of dust generated.

1.0.1 Disturbance of cultural resources

From the field investigations there are no known areas of cultural resources in the area. However, one should not bar the outside remote chance that during the digging, something may be unearthed. The probability of this happening is very low and hence the impact is viewed to be of low significance. If these existed, they could have been disturbed by construction of houses and other buildings. So whilst the Bank's policy on cultural resources (OP 411 Physical Cultural Resources) states that projects avoid these, under the current set up, it is recommended that where they will be construction of water pipelines, contractors avoid areas with grave yards and other known cultural resources like trees with medicinal value or forests used for traditional activities. At the moment the investigation did not come across any such resources. The area for the water tanks has already been cleared.

As mitigation measures, watching briefs and stopping of works until NMMZ is notified and provide advise will reduce impact significance.

Assessment for cultural resources during construction phase

| Assessment Criteria | Rating |
|--------------------------------|----------|
| Type/status | Negative |
| Extent or spatial scale | Low |
| Duration | Long |
| Mitigatory potential | High |
| Acceptability | High |
| Degree of certainty | Probable |
| Significance before mitigation | Moderate |
| Significance after mitigation | Low |

Disturbance to other services

The project will involve digging trenches for laying water pipes. It is possible that in some of these areas there could be other buried services like PTC cables, ZESA lines and sewer lines, especially in the commercial centre of Mataga. Reckless digging may end up severing these services which may be buried under ground resulting serious disruption. This is potentially an impact of moderate significance given its probability of occurrence and the easy with which such an impact can be mitigated.

Assessment for disturbance of other buried services during construction phase

| Assessment Criteria | Rating |
|--------------------------------|---------------|
| Type/status | Negative |
| Extent or spatial scale | Low |
| Duration | Low to medium |
| Mitigatory potential | High |
| Acceptability | High |
| Degree of certainty | Probable |
| Significance before mitigation | Moderate |
| Significance after mitigation | Low |

Such an impact can be mitigated by liaising with the relevant authorities like ZESA, PTC and council sewer services to get maps of any buries services and determine where they run. This should be done prior to trenching activities in any area.

Socio-economic impacts: Operation Phase

This is the phase with the most durable impacts. Most of the impacts related to this phase will last as long the completed water projects are in existence. Some are direct while a significant proportion.

Positive Impacts

The activities that will generate positive impacts include:

- Investment in Mataga
- Employment creation in provision, operations and maintenance. ZINWA/RDC will need more people to maintain their system
- Increased disposable incomes due to increased availability of paid jobs.
- Increase in local authority/ZINWA income through rates, rents and user charges
- Development of ancillary activities for production and services upstream and downstream.
- Improvement in hygiene and health
- Income generating activities at household level

Employment creation

As more reliable water becomes available industrial, institutional and commercial establishments sprout, more jobs will become available in Mataga. It will be able to attract investment. A new government complex will be constructed and it will employ a lot of people. It is therefore anticipated that as the commercial and industrial areas are developed more jobs will be created. Added to this are the extensive backward and forward linkages that are set to create even more jobs.

Assessment for employment creation during operation phase

| Assessment Criteria | Rating |
|--------------------------------|---------------|
| Type/status | Positive |
| Extent or spatial scale | Medium |
| Duration | Long |
| Mitigatory potential | High |
| Acceptability | Low |
| Degree of certainty | Probable |
| Significance before mitigation | Moderate |
| Significance after mitigation | Low |

It is recommended that positive discrimination in favour of locals should be encouraged for the above positive impacts to be realized.

Improvement in Hygiene

Hygiene and health of households will generally improve with more water being available for domestic use. Households will be able to use flush toilet. This will reduce the current practice of using the bush as toilets. This will in turn reduce the risks of contamination arising from this practice. Households will also be able to use clean water for washing clothes plates and engage in other household chores requiring more water. Some households also have pit latrines on their small 200-300m² plots. Some of these also have shall wells and there is a huge risk of contamination of the wells by the pit latrines resulting in outbreaks of diseases like cholera and typhoid.

Assessment for hygiene during operation phase

| Assessment Criteria | Rating |
|--------------------------------|----------|
| Type/status | Positive |
| Extent or spatial scale | Low |
| Duration | Long |
| Mitigatory potential | High |
| Acceptability | Low |
| Degree of certainty | Probable |
| Significance before mitigation | Moderate |
| Significance after mitigation | Low |

This is a significant positive impact which will last for as the project life time.

Income Generating Activities and Greening

All households indicated that they will embark on income generating projects like poultry and vegetable growing if water is available. They indicated that under the current economic situation it would be desirable to have a project that gives them an income, even just a vegetable garden. However, this is difficult without water close by. The introduction of reticulated water will enable the households to engage in these activities.

Assessment for income generating activities during operation phase

| Assessment Criteria | Rating |
|--------------------------------|---------------|
| Type/status | Positive |
| Extent or spatial scale | Low |
| Duration | Short long |
| Mitigatory potential | High |
| Acceptability | Low |
| Degree of certainty | Probable |
| Significance before mitigation | Moderate |
| Significance after mitigation | Low |

This is a positive impact of moderate significance and will last for as long as the project is in existence.

Time for other Chores

At the moment, the female members of the households spend a lot of time fetching water. For some of the households, it can take up to 30 minutes per trip using 20-25 liter containers. On average, they visit the water sources 3-4 times per day. This is time which could have been spend on other chores had water been available. The provision of water will mean that the female members of households will have adequate time for other chores like cooking, cleaning the house or looking after children. Sometimes children have to work up early and go to the boreholes first before going to school.

Assessment for increased time for other during operation phase

| Assessment Criteria | Rating |
|----------------------------|---------------|
| Type/status | Positive |
| Extent or spatial scale | Low |
| Duration | long |
| Mitigatory potential | High |
| Acceptability | Low |

| | |
|--------------------------------|----------|
| Degree of certainty | definite |
| Significance before mitigation | Moderate |
| Significance after mitigation | Low |

This impact will definitely occur and will improve the life of household as they will be able to take time off from their duties of fetching for water.

Speed up Construction

Construction of houses in the new areas of Mataga has slowed down because of the problem of the availability of water. Those constructing houses have to pay vendors to ferry water from the borehole to their stands. The plot owners pay \$5 for a 200 litre drum of water. This makes the construction process expensive and slow. However, it creates employment for those who are in the informal business of ferrying water.

Safety around raised water tanks

Safety concerns with regard to overhead water tanks in residential areas have been raised as a major issue. Two such facilities will be provided in Mataga. There is fear that children can wonder to water tank sites and climb up risking falling down or into the water tanks. This can result in serious injury or even drowning.

Assessment for loss of safety around raised water tanks during operation phase

| Assessment Criteria | Rating |
|--------------------------------|---------------|
| Type/status | Negative |
| Extent or spatial scale | Low |
| Duration | Long |
| Mitigatory potential | High |
| Acceptability | medium |
| Degree of certainty | Probable |
| Significance before mitigation | Moderate |

| | |
|-------------------------------|-----|
| Significance after mitigation | Low |
|-------------------------------|-----|

This impact can be easily mitigated by fencing off the areas around the tanks and ensuring that there is no easy access. Gates to the tank should always be locked and only those with business at the water tanks are allowed access.

Handling of Chemicals

Safety concerns arise in terms of increased handling of water treatment chemicals such as Alum and Hth chlorine by workers during the operational phase. There is fear of chemical spills and leakages of chemicals which may result in chemical burns and suffocation of workers.

Assessment for loss of safety around handling of chemicals during operation phase

| Assessment Criteria | Rating |
|--------------------------------|----------|
| Type/status | Negative |
| Extent or spatial scale | Low |
| Duration | Long |
| Mitigatory potential | High |
| Acceptability | medium |
| Degree of certainty | Probable |
| Significance before mitigation | Moderate |
| Significance after mitigation | Low |

This impact can be easily mitigated by providing gas masks and full safety hood equipment for handling chlorine gas and chemical resistant equipment (such as aprons, gloves and work suits) during the whole project phase. This will be coupled by installation of chlorine gas leakage monitoring devices.

Assessment for speeding construction during operation phase

| Assessment Criteria | Rating |
|--------------------------------|---------------|
| Type/status | Positive |
| Extent or spatial scale | Low |
| Duration | Long |
| Mitigatory potential | High |
| Acceptability | Low |
| Degree of certainty | Definite |
| Significance before mitigation | Moderate |
| Significance after mitigation | Low |

ENVIRONMENT AND SOCIAL MANAGEMENT PLAN FOR MATAGA

**Table 4.1: Water Supply Project Environmental Management Plan
BIOPHYSICAL IMPACTS**

| Impact Statement | Process/Activity responsible for impact | Proposed Mitigation on impact | Monitoring and Management Agency | Management and Monitoring activities | Time frame | Budget (USD) |
|----------------------------------|--|--|---|---|-------------------|---------------------|
| <i>Soil disturbance</i> | Walking up and down the proposed trench lines may loosen soil | Avoiding unnecessary movements and pulling of equipment on the ground | RDCs, EMA, ZINWA, Contractor | Check for signs of loose soil along trace lines | Planning phase | Negligible |
| <i>Siltation</i> | Loose soil can potentially result in siltation during the rainy season | <ul style="list-style-type: none"> Attend to loose soil immediately | ZINWA, Contractor | As above | As above | Negligible |
| <i>Disturbance of vegetation</i> | Cutting down trees along trace lines and | <ul style="list-style-type: none"> Avoid cutting down | Contractor, ZINWA | Mark trees to left standing and check for new | As above | Negligible |

| Impact Statement | Process/Activity responsible for impact | Proposed Mitigation on impact | Monitoring and Management Agency | Management and Monitoring activities | Time frame | Budget (USD) |
|---|---|--|----------------------------------|---|------------|--------------|
| | pegging sites | <p>tress</p> <p>Where trees are cut, replant. Commitment to replant as close as possible in terms of proximity and species type, and to replant more than are lost to allow for successful reinstatement</p> <ul style="list-style-type: none"> • | | trees planted | | |
| <i>Alteration of soil compaction properties and exposure to</i> | Digging of trenches | Backfill all trenches and sprinkle water on loose soil mounds | EMA, RDC, ZINWA | Backfilling should be carried out immediately after the laying of water pipes | Continuous | Negligible |

| Impact Statement | Process/Activity responsible for impact | Proposed Mitigation on impact | Monitoring and Management Agency | Management and Monitoring activities | Time frame | Budget (USD) |
|--|---|--|---|---|----------------------------|---------------------|
| <i>erosion</i> | | | | | | |
| <i>Extermination of indigenous species, appearance of new species which could be dangerous</i> | Cutting down of trees and other vegetation during trenching | <ul style="list-style-type: none"> • There is virtually no indigenous vegetation in the areas. • Avoid the little natural vegetation in the area | Community, EMA, RDC | Check routing of pipes to ensure it does not pass through any remaining vegetated areas | Construction phase | Negligible |
| <i>Dust generation</i> | Trenching and backfilling | Sprinkle water on soil and backfill trenches immediately | ZINWA, RDC, Contractor | Ensure trenches are not left open for more than 2 days | Construction phase | 1 000 |
| <i>Water contamination</i> | Backwashing activities | Filter integrity to be maintained and a dedicated backwash | ZINWA, RDC, | Regular blowing of the filters and replacement after design period | Throughout operation phase | 2500 |

| Impact Statement | Process/Activity responsible for impact | Proposed Mitigation on impact | Monitoring and Management Agency | Management and Monitoring activities | Time frame | Budget (USD) |
|-------------------------|--|--------------------------------------|---|---|-------------------|---------------------|
| | | mains and lined backwash ponds | | | | |

Table 4.2: Water Supply Project Environmental Management Plan: Socio-economic Impacts

| Impact Statement | Process/Activity responsible for impact | Proposed Mitigation on impact | Monitoring and Management Agency | Management and Monitoring activities | Time frame | Budget (USD) |
|-------------------------|--|--------------------------------------|---|---|-------------------|---------------------|
| PLANNING PHASE | | | | | | |
| <i>Employment</i> | Laborers to assist | Employ local | Local leadership, | Insist in contractual documents for the | Planning Phase | - |

| | | | | | | |
|--|---|--|-------------------------------|---|--------------|-------|
| <i>creation</i> | surveyors and pagers | youths | ZINWA, Contractor | employment of locals | | |
| CONSTRUCTION PHASE | | | | | | |
| <i>Creation of employment</i> | Laborers for digging trenches and working with builders | Employ locals | Contractor | Number of locals youths engaged as laborers | Continuous | – |
| <i>Increased traffic and pressure on roads</i> | Introduction of construction vehicles in the project area | Enforce speed limits; Maintain local roads | ZINWA, RDC Contractors | Place speed limit insignia in the vicinity of project; follow a strict road maintenance schedule | Continuous | 3 000 |
| <i>Worker safety</i> | Injuries from blasting or use of machinery | Provide adequate protective clothing and awareness | NSSA, ZINWA, Contractor | Check on protective clothing for workers | Construction | 2 000 |
| <i>Injury to children and others</i> | Falling into open trenches | Backfill trenches immediately | Contractor, ZINWA | Trenches to be backfilled at most after 2 days. Temporary fencing using materials such as reflective safety tape to make sure that there are no injuries during the construction period | Construction | 500 |

| | | | | | | |
|--|---|---|-------------------------------------|--|--------------------|-------|
| <i>Health and Promiscuity</i> | Moneyed construction workers engaging prostitutes | Awareness campaigns on AIDS and STIs | Contractor | Worker entertainment activities | Construction | 1 000 |
| <i>Disturbance and disruption of buried services</i> | Breaking PTC, ZESA cables or sewer lines | Liaise and consult ZESA, PTC or sewer department for any buried services in areas to be trenched. Get maps of services | ZINWA, Contractor | Ensure services maps are available | Construction Phase | 500 |
| <i>Disturbance of physical cultural resources</i> | Digging of cutting down trees or disturbance of forests of cultural value | Avoid areas of cultural value if any | ZINWA, Contractor, Local leadership | Mark all areas of cultural value if any Report findings to National Museums and Monuments | Construction Phase | 200 |
| <i>Waste generation</i> | Off-cuts, wrappings, packagings, other domestic waste | Reuse all reusable packaging materials Provide proper waste landfill which will be covered after Provide bins | ZINWA Contractor | Make sure bins are used | Construction | 1 000 |

OPERATION PHASE

| | | | | | | |
|--|--|--|------------------------|--|-----------------|-------|
| <i>Income generating projects</i> | Availability of water will enable households to embark on poultry and gardening projects and other greening activities | Encourage households to set up projects | RDC, Local leadership, | Number of income generating projects set up | Operation phase | 500 |
| <i>Improved revenue for ZINWA</i> | Payments for consumption | Implement good billing and collection system Minimize losses through leakages | ZINWA | Amounts collected | Operation phase | 1 500 |
| <i>Improvement in hygiene and health</i> | The availability of clean water at primary school will mean of flush toilets, clean drinking water | Ensure water is available for a minimum of 12 hours every day | ZINWA, RDC, | Check down times for water pumping and quantities against demand | Operation phase | 2 000 |

| | | | | | | |
|------------------------------|--|--|------------|---|-----------------|-----|
| <i>Speed up construction</i> | Will no longer rely on buying water from water vendors | Make water available at least for 12 hrs per day | ZINWA, RDC | Numbers of houses/businesses/institutions being constructed | Operation phase | 500 |
|------------------------------|--|--|------------|---|-----------------|-----|

ENVIRONMENTAL RULES FOR CONTRACTORS



Prepared in Line with the ZINWA SHE Policy (2015)

1. General

In addition to these general conditions, the Contractor shall comply with any specific Environmental and Social Management Plan (ESMP) for the works he is responsible for. The Contractor shall inform himself about such an ESMP, and prepare his work strategy and plan to fully take into account relevant provisions of that ESMP. If the Contractor fails to implement the approved ESMP after written instruction by the Resident Engineer (RE) to fulfill his obligation within the requested time, the ZINWA as the project implementer reserves the right to arrange through the Project Manager (PM) for execution of the missing action by a third party on account of the Contractor.

- 1.2 *Notwithstanding the Contractor's obligation under the above clause, the Contractor shall implement all measures necessary to avoid undesirable negative environmental and social impacts wherever possible, restore work sites to acceptable standards, and abide by any environmental performance requirements specified in an ESMP. In general these measures shall include but not be limited to:*
 - 1.2.1 Minimize the effect of dust on the surrounding environment resulting from earth mixing sites, land clearing, dispersing coal ashes, vibrating equipment, temporary access roads, etc. to ensure safety, health and the protection of workers and communities living in the vicinity of dust producing activities.
 - 1.2.2 Ensure that noise levels emanating from machinery, vehicles and noisy construction activities (e.g. excavation, blasting) are kept at a minimum for the safety, health and protection of workers within the vicinity of high noise levels and nearby communities.
 - 1.2.3 Ensure that there is no disturbance of existing water flow regimes in rivers, streams or dams
 - 1.2.4 Prevent oils, lubricants and waste water used or produced during the execution of works from entering into rivers, streams, and other natural water bodies/reservoirs, and also ensures that stagnant water within the working area is treated in the best possible way to avoid breeding of mosquitoes.
 - 1.2.5 Upon discovery of ancient heritage, relics or anything that might or believed to be of archeological or historical importance during the execution of works, immediately report such findings to the PIT so that the appropriate authorities, including the NMMZ may be expeditiously contacted for fulfillment of the measures aimed at protecting such historical or archaeological resources.
 - 1.2.6 Discourage construction workers from engaging in the exploitation of natural resources such as hunting, fishing, and collection of forest products or any other activity that might have a negative impact on the social and economic welfare of the local communities.
 - 1.2.7 Implement soil erosion control measures in order to avoid surface run off and prevents siltation, etc.
 - 1.2.8 Ensure that garbage, sanitation and drinking water facilities are provided in construction workers camps.

- 1.3 *The Contractor shall indicate the period within which he/she shall maintain status on site after completion of civil works to ensure that significant negative impacts arising from such works have been appropriately addressed.*
- 1.4 *The Contractor shall adhere to the proposed activity implementation schedule and the monitoring plan / strategy to ensure effective feedback of monitoring information to project management so that impact management can be implemented properly, and if necessary, adapt to changing and unforeseen conditions.*
- 1.5 *Besides the regular inspection of the sites by the RE for adherence to the contract conditions and specifications, the ZINWA appointed a Safeguards Officer (SO) based at Catchment offices to oversee the compliance with these environmental conditions and any proposed mitigation measures. In all cases, as directed by the RE and SO, the Contractor shall comply with directives from such inspectors to implement measures required to ensure the adequacy rehabilitation measures carried out on the bio-physical environment and compensation for socio-economic disruption resulting from implementation of any works.*
- 1.6 *Ensure service maps are available to prevent disturbances and disruption of buried services such as electricity or telecommunication cables or sewer pipes.*

2 Worksite/Campsite Waste Management

- 2.0 Ensure service maps are available to prevent disturbances and disruption of buried services such as electricity or telecommunication cables or sewer pipes.
- 2.1 All waste containers, litter and any other waste generated during the construction shall be collected and disposed off at designated disposal sites in line with applicable EMA requirements and conditions set in the ESMP.
- 2.2 All drainage and effluent from storage areas, workshops and camp sites shall be captured and treated before being discharged into the drainage system in line with EMA's waste and effluent disposal requirements.
- 2.3 Construction waste shall not be left in stockpiles along the roads, but removed and reused or disposed of on a daily basis at designated disposal points.

3 Rehabilitation and Soil Erosion Prevention

- 3.0 *To the extent practicable, the Contractor shall rehabilitate the site progressively so that the rate of rehabilitation is similar to the rate of construction.*
- 3.1 *Always remove and retain topsoil for subsequent rehabilitation around temporary camps as possible and re-vegetate areas not required after construction. Topsoil shall not be stored in large heaps. Low mounds of no more than 1 to 2m high are recommended.*
- 3.2 *Revegetate with local plant species that will control erosion, provide vegetative diversity and, through succession, contribute to a resilient ecosystem.*
- 3.3 *Ensure soil is stockpiled for future use and used to re-profile and rehabilitate closed affected areas.*
- 3.4 *Backfilling should be carried out immediately after the laying of the water pipes to prevent exposure to erosion that result in siltation of rivers and dams.*
- 3.5 *All open trenches should be fenced off with reflective tape material as they pose a potentially serious safety hazard to the school children and local population (especially at night) or provide proper demarcation and display warning signs.*
- 3.6 *Use dust suppression measures such as sprinkling water on soil in working sites and access roads.*
- 3.7 *Use only approved sites for sand abstraction pits and solid waste disposal.*

4 Water Resources Management

- 4.0 *Abstraction of water from wetlands shall be avoided.*
- 4.1 *No construction water containing spoils or site effluent, especially cement and oil, shall be allowed to flow into natural water drainage courses.*
- 4.2 *Wash water from washing out of equipment shall not be discharged into water courses or road drains.*
- 4.3 *Site spoils and temporary stockpiles shall be located away from the drainage system, and surface run off shall be directed away from stockpiles to prevent erosion.*

5 Traffic Management

- 5.0 *Access roads shall not traverse wetland areas.*
- 5.1 *Upon the completion of civil works, all access roads shall be ripped and rehabilitated.*
- 5.2 *Place speed limits insignia in the vicinity of projects as there will be increased traffic and pressure on roads.*
- 5.3 *Maintain local roads and follow a strict road maintenance schedule.*
- 5.4 *Ensure that vehicle washing and machinery maintenance is done only in authorized areas (away from waterways).*

6 Blasting

- 6.0 *Blasting activities shall not take place less than 2km from settlement areas, cultural sites, or wetlands without the permission of the RE.*
- 6.1 *Blasting activities shall be done during working hours, and local communities shall be consulted and notified on the proposed blasting times.*
- 6.2 *Noise levels reaching the communities from blasting activities shall not exceed 90 decibels or as guided by the National Social Security Authority (NSSA)*

7 Health and Safety

- 7.0 *In advance of the construction work, the Contractor shall mount an awareness and hygiene campaign. Workers and local residents shall be sensitized on health risks particularly of HIV/AIDS*
- 7.1 *Provide safety equipment and adequate protective clothing and awareness to all construction workers to prevent or reduce injuries from work related activities.*
- 7.2 *Provide worker entertainment activities and awareness campaigns on STIs and HIV/AIDS to prevent or minimize the spread of STIs and HIV/AIDS through promiscuity of moneyed construction workers engaging prostitutes.*

- 7.3 *Adequate signs to warn pedestrians and motorists of construction activities, diversions, etc. shall be provided at appropriate points*
- 7.4 *Construction vehicles shall not exceed maximum speed limit of 40km per hour.*
- 7.5 *Seek approval for transportation, use, storage of hazardous chemicals.*
- 7.6 *Handle and store all hazardous materials in line with their corresponding Materials Safety Data Sheets.*

8 Repair of Private Property

- 8.0 *Should the Contractor, deliberately or accidentally, damage private property, he shall repair the property to the owner's satisfaction and at his own cost. For each repair, the Contractor shall obtain from the owner a certificate that the damage has been made good satisfactorily in order to indemnify the Client from subsequent claims.*
- 8.1 *In cases where compensation for inconveniences, damage of crops etc. are claimed by the owner, the Client has to be informed by the Contractor through the SE. This compensation is in general settled under the responsibility of the Client before signing the Contract. In unforeseeable cases, the respective administrative entities of the Client will take care of compensation*

9 Contractor's Safety, Health and Environment Management Plan (SHE-MP)

- 9.0 *Within 6 weeks of signing the Contract, the Contractor shall prepare an SHE-MP to ensure the adequate management of the health, safety, environmental and social aspects of the works, including implementation of the requirements of these general conditions and any specific requirements of an EMP for the works.*
- 9.1 *The Contractor shall prepare bi-weekly progress reports to the RE on compliance with these general conditions, the project ESMP if any, and his own SHE-MP.*
- 9.2 *It is advisable that reporting of significant SHE incidents be done "as soon as practicable". Such incident reporting shall therefore be done individually. Also, it is advisable that the Contractor keeps his own records on health, safety and welfare of persons, and damage to property. It is advisable to include such records, as well as copies of incident reports, as appendices to the bi-weekly reports.*

10 Training of Contractor's Personnel

The Contractor shall provide sufficient training to his own personnel to ensure that they are all aware of the relevant aspects of these general conditions, any project ESMP, and his own SHE-MP, and are able to fulfill their expected roles and functions.

11 Cost of Compliance

11.0 It is expected that compliance with these conditions is already part of standard good workmanship and state of the art as generally required under this Contract. The item "Compliance with Environmental Management Conditions" in the Bill of Quantities covers these costs. No other payments will be made to the Contractor for compliance with any request to avoid and/or mitigate an avoidable SHE impacts.

APPENDICES

APPENDIX 1. STAKEHOLDER PUBLIC NOTICE

APPENDIX 2. STAKEHOLDER CONSULTATION QUESTIONNAIRES

APPENDIX 3. STAKEHOLDER CONSULTATION MINUTES

APPENDIX 4. 1:50000 TOPOGRAPHICAL MAP FOR MATAGA

APPENDIX 5. FULL CHEMICAL AND BACTERIOLOGICAL RESULTS FOR RAW AND TREATED MUNDI MATAGA WATER

APPENDIX 6. FULL CHEMICAL AND BACTERIOLOGICAL RESULTS FOR RAW AND TREATED GWAVIMUTANGWI WATER

